Summer Internship Report at Piramal Foundation, Bihar

(22nd April 2024 to 22thJune 2024)

A Report

By

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Under guidance from:

Dr. Sukesh Bhardwaj

PGDM (Hospital and Health Management)

2023-2025

International Institute of Health Management Research, New Delhi

ACKNOWLEDGEMENT

I had a fantastic opportunity to learn and advance my career during my internship with Piramal Foundation. I therefore count myself as extremely fortunate to have had the chance to take part in it. I'm also appreciative that I've had the opportunity to meet so many experts who guided me during my internship. In light of this, I would like to take this opportunity to extend my sincere gratitude and special thanks to Dr. Tanmay Mahapatra, Director of Data and Learning at the Piramal Swasthya Management and Research Institute, who, in spite of his extremely busy schedule, took the time to listen to me, offer advice, and steer me in the right direction. He also gave me permission to complete my project at their prestigious institution. I would like to sincerely thank Sweta Kumari ma'am for helping me make important decisions, providing the required counsel and direction, and setting up all the resources I needed to complete my project more easily. I'd like to take this opportunity to express my gratitude for her contribution.

I would like to express my sincere gratitude and best wishes to Dr. Sutapa Bandyopadhyay Neogi, Director of IIHMR Delhi; Dr. Sumesh Kumar, Associate Dean Academics and Student Affairs; and my mentor, Dr. Sukesh Bhardwaj (Associate Professor), IIHMR Delhi, for their thoughtful and priceless guidance, which was invaluable for my study in both theory and practice.

I see this as a significant turning point in my professional development. In order to achieve my desired career goals, I will make every effort to make the best use of the knowledge and skills I have acquired. I will also keep working to improve them. I look forward to working with each of you in the future.

Sincerely,

Dr. Apurva Ahuja

PGDM in Health and Hospital management

PG/23/023

Name: **Dr. APURVA AHUJA**

In recognition of having successfully completed her internship in the department of **RMLE** and has successfully completed her Project on

Title: "Introduction about RMNCHN in context of Bihar"

Date: **21st June 2024**

Organization: **Piramal Swasthya Management and Research Institute**

She comes across as a committed, sincere & diligent person who has a strong drive & zeal for learning

We wish him/her all the best for future endeavours.

Organization Supervisor & Department Head

Dr Tanmay Mahapatra	Ms. Amita Shukla
Director, Data & Learning	Senior Program Manager - HR

Piramal Swasthya Management and Research Institute

Piramal Swasthya Management and Research Institute

Head Office: 3rd Floor, No. 6-3-1112, Oyster Complex, Greenlands Road, Somajiguda, Begumpet, Hyderabad – 500 016 piramalswasthya.org

FEEDBACK FORM

Name of the Student: Dr. Apurva Ahuja

Summer Internship Institution: Piramal Swasthya Management and Research Institute **Area of Summer Internship:** Public Health with a special focus on RMNCH+N **Attendance:** Perfect adherence to internship norms.

Objectives met: Learnt Literature Review, Evidence Table Generation, Reference Management, Tool Development, Epidemiological concepts, Digital Data Management & Quality control, Determining the Themes and Sub-themes, Developing Code Dictionary, Data Collection, Data Management, Basic Quantitative Analysis and Thematic Extraction of Information from Qualitative Data.

Deliverables: -

- Desk review on "Intrapartum and postnatal care among mothers of infants aged 0-2 months", made an evidence table, documented the findings, recommendations, and limitations of this study in the report.
- Participated in Data collection in a mini household survey and analysed the data using SAS software on some key RMNCH+N indicators in the context of Bihar.
- Field visits in Sub-District hospital in Danapur, Patna and Health and Wellness Center, Bhausala, Danapur. Also interacted with CHO and ASHA workers in HWC.
- Documented the entire process and findings, including insights from the field visits in a detailed report.
- Basic introduction about SAS, data cleaning and management and research methodology concepts.
- Assisted and contributed in making of presentation on “Mini Household Survey”

Strengths:

Very good adherence to protocols, ready wit, learning spree, punctuality, clarity of understanding, writing skill, communication skills, teamwork, commitment, sincerity and diligence with analytical progress. Based on her learning abilities and efforts, it appears that, given the level of effort and aptitude she has, if given chance she can become an asset of the public health research and implementation sector of India.

Suggestions for Improvement:

Scientific writing, advanced analytics, programmatic knowledge, stakeholder management

Signature of the Officer-in-Charge (Internship)  **Date: 12.12.2024**

Place: Patna

FEEDBACK FORM

(IIHMR MENTOR)

Name of the Student: Apurva Ahuja

Summer Internship Institution: Piramal Swasthya

Area of Summer Internship: Public Health with a special focus on RMNCH+N

Attendance: Adherence to internship norms.

Objectives met: Literature Review, Evidence Table Generation, References, Tool study. Data Analysis & Interpretation. Determining the themes and sub-themes, Developing code dictionary, Thematic extraction of Inf. from Qualitative Data

Deliverables: Desk Review on "Intrapartum and postnatal care among mothers & infant aged 0-2 months".

→ Participated in Data collection in a mini household survey and analysed the Data using SAS software on some key RMNCH+N indicators in the context of Bihar.

→ Field visit in sub-district hospital in Danapur, Patna and Health and wellness center, Bhaisda, Danapur

Strengths: Sincere & dedicated student

Suggestions for Improvement: Analytical skills

Signature of the Officer-in-Charge (Internship)

Date:

Place: New Delhi

Certificate of Approval

The Summer Internship Project of titled **"Introduction about RMNCAH+N in context of Bihar"** at **"Piramal Foundation"** is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **Post Graduate Diploma in Health and Hospital Management** for which it has been submitted.
It is understood that by this approval the undersigned do not necessarily endorse or approve any
statement made, opinion expressed, or conclusion drawn therein but approve the report only for
the purpose it is submitted.

Dr Sukesh Bhardwaj

[Professor and Dean Research, IIHMR Delhi]
IIHMR, Delhi

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ACRONYMS/ABBREVIATION

- **THR** - Take Home Ration
- **STSC** - Skin to Skin Care
- **TIBF** - Timely Initiation of Breast Feeding
- **SAS** - Statistical Analysis System
- **NHM** - National Health Mission
- **SDG** - Sustainable Development Goal
- **RMNCAH+N** - Reproductive Maternal Newborn Child Adolescent Health and Nutrition
- **CAT** - Call to Action
- **CAD** – Care Around Delivery
- **PHC** - Primary Health Centre
- **NRHM** - National Rural Health Mission
- **ANM** - Auxiliary Nurse Midwife
- **IMNCI** - Integrated Management of Childhood Illnesses
- **ASHAs** - Accredited Social Health Activists
- **JSSK** - Janani Shishu Suraksha Karyakram
- **IFA** - Iron and Folic Acid
- **ARSH**- Adolescent Reproductive and Sexual Health
- **NFHS** - National Family Health Survey
- **CHO** - Community Health Officer
- **NRC** - Nutrition Rehabilitation Centre
- **VHSND** - Village Health Sanitation and Nutrition Day
- **MCP** - Mother and Child Protection
- **AMANAT** - Accreditation of Maternity and Newborn Acute Care Training
- **LAQSHYA** - Labor Room Quality Improvement Initiative
- **HHS** – Household Survey

ORGANIZATION PROFILE

Piramal Foundation- Solving India's most intractable problems through Innovation, Collaboration and Sewa Bhaav

VISION: Building Bharat through leadership, decentralisation, digitisation and inclusion led by women and youth.

India has embarked on the journey towards ensuring Universal Health Coverage and Piramal Swasthya is contributing with its experience & expertise of building innovative solutions that impact at scale.

Piramal Swasthya is focused on bridging public healthcare gaps by supplementing and complementing Government of India's vision to meet Universal Health Coverage. Piramal Swasthya is one of the largest not-for-profit organizations in India – in the primary public healthcare space with a focus on Maternal Health, Child and Adolescent Health, Non-communicable Diseases. Piramal Swasthya has over a decade-long experience in operating several healthcare innovations at scale, which are addressing the primary healthcare needs of most underserved and marginalized populations across India. Piramal Foundation is operational in 27 States and 2 Union Territories in India through innovative public healthcare delivery programs.

Core Values:

• **Respect**, upholding the dignity of each individual.

• **Integrity,** adhering to an ethical code of conduct in all actions.

• **Commitment,** fulfilling our duties and social responsibilities.

• **Excellence,** setting high performance standards and being accountable to them.

Approach:

• Gender Equality

• Knowledge, Management and Learning

1. ***Observational learnings***

   a. **Description of the 2 months internship journey**

1. **Research Methodology Sessions**:

- I had the privilege of attending in-depth sessions by Tanmay sir on various research methodology topics.
- These sessions provided a comprehensive understanding of different research topics.
- Irshad Sir conducted specialized sessions focusing on literature review techniques and how to effectively search for scholarly articles.
- I was trained in creating evidence tables, which are crucial for organizing and summarizing research findings.
- Additionally, I was introduced to important software tools used for referencing, enhancing our research efficiency and accuracy.

2. **Data Cleaning and Management**:
    - Kunal Sir and Alok Sir led insightful sessions on data cleaning and management.
    - I learned various techniques to clean and manage data, an essential step before conducting any analysis.
    - These sessions emphasized the importance of maintaining data integrity and ensuring that datasets are ready for accurate analysis.
3. **Data Analysis**:
    - Shuchi Ma'am, Manoj Sir, and Ashish Sir provided data analysis training.
    - I was introduced to the SAS Software, a powerful tool for data analysis.
    - The sessions covered key aspects of using SAS for analysing large datasets, allowing us to draw meaningful insights from the data.
4. **Field Visits**:
    - As part of my internship, I had the opportunity to participate in multiple field visits.
    - These visits provided practical, on-the-ground experience and allowed us to observe the real-world Health System.
    - The detailed experiences and learnings from these field visits are discussed in further sections of the report.
5. **Slide Deck Preparation**:
    - I contributed to the preparation of the HHS slide deck.
    - Further details on this project are discussed in subsequent sections of the report.

Overall, this internship at Piramal Swasthya Foundation in Patna was an enriching experience that provided a balanced mix of theoretical knowledge and practical application. The diverse sessions and field visits equipped us with essential skills in research, data management, and analysis, while also allowing us to contribute meaningfully to ongoing projects.

b. **Learnings from the different sessions**

Detailed Learnings from Research Methodology Sessions at Piramal Foundation

Foundational Concepts in Research:

We began with the basics of research methodology to later on understanding the the concepts that support scientific study.

1. **Key Research Terms and Concepts Learned like** Incident rate ratio, Incidence proportion, ecological fallacy, temporal ambiguity, Inductive & Deductive approach, Emic & Etic, Biological plausibility, Hill Criteria, Ecological study, Randomization & Random selection, Induction period & Latency period, Prospective & Retrospective study, Measures of association & Measures of occurance, Relative risk & Risk ratio, etc.

Literature Review Techniques:

2. **Importance of Literature Review**: Emphasized the critical role of reviewing existing literature to identify gaps and build on prior research.
3. **Article Search Methods**:
    a. **Platforms**: Learned to search for scholarly articles on platforms like PubMed and Google Scholar.
    b. **Techniques**: Used relevant filters, MeSH terms, and Boolean operators to refine search results.
4. **Evidence Table Construction**:
    a. **Columns to Include**: Discussed the essential columns such as author, year, study design, and key findings.
    b. **Chronological Order**: Organized articles chronologically and prioritized global articles before Indian studies.

Reference Management:

5. **EndNote Software**: Gained proficiency in using EndNote for managing references, including adding and organizing citations efficiently.

Detailed Learnings from Data Cleaning & Management Sessions at Piramal Foundation

1. **Pivot Tables**:
    - Learned how to use pivot tables in Excel to summarize, analyze, and explore large datasets efficiently.
    - Gained skills in creating pivot tables to sort, count, and total data, allowing for dynamic data exploration and reporting.
2. **Conditional Formatting**:
    - Understood how to apply conditional formatting to highlight important data points, trends, and patterns within a dataset.

- Practiced using color scales, data bars, and icon sets to visually distinguish data based on specific criteria.

3. **Data Visualization**:
    - Learned to create diverse types of charts to visually represent data:
        - **Column Chart**: For comparing data across categories.
        - **Bar Chart**: For visualizing data in a horizontal format.
        - **Line Chart**: For showing trends over time.
        - **Combo Chart**: For combining two different chart types to show different data series.
        - **Pie Chart**: For displaying proportions of a whole.
    - Emphasized the importance of choosing the right chart type to effectively communicate data insights.
4. **Data Validation**:
    - Understood the importance of data validation to ensure data integrity and accuracy.
    - Learned to set validation rules to restrict the type of data or values that users can enter into a cell.
5. **The SUBTOTAL Function**:
    - Explored the SUBTOTAL function in Excel, which allows for the creation of groups within data.
    - Learned to perform various functions such as SUM, COUNT, AVERAGE, PRODUCT, and MAX on these groups.
    - Practiced using SUBTOTAL to perform calculations on filtered data, providing more accurate summaries and analyses.
6. **IF, COUNTIF, and SUMIF Functions**:
    - **IF Function**: Learned to use the IF function to perform logical tests and return specific values based on the results.
    - **COUNTIF Function**: Practiced using the COUNTIF function to count the number of cells that meet a specific criterion.
    - **SUMIF Function**: Understood how to use the SUMIF function to sum the values in a range that meet specific criteria.

These sessions on data cleaning and management provided essential skills for preparing and organizing data for analysis. From mastering pivot tables and conditional formatting to utilizing advanced Excel functions and creating effective data visualizations, we are now equipped to handle data more efficiently and accurately.

Detailed Learnings from Data Analysis Sessions at Piramal Foundation

1. **Introduction to SAS Software**:
    - We were introduced to the significance of SAS software in data analysis.
    - Understood why SAS is a preferred tool for analysing large datasets.

2. **Getting Started with SAS**:
    - Learned to use the online SAS software initially, which helped us familiarize ourselves with the interface and basic functionalities.
    - Later, we installed the offline SAS software on our laptops, enabling us to work on data analysis projects independently.
3. **Foundational SAS Skills**:
    - **Types of Libraries**: Taught about different types of libraries in SAS, focusing on creating a permanent library to store datasets.
    - **Basic Syntax and Procedures**:
        - **PROC IMPORT**: Learned to import data from various sources into SAS.
        - **PROC PRINT**: Used to display the data.
        - **PROC CONTENTS**: Provided details about the dataset, including variable names and types.
        - **PROC SORT**: Learned to sort data based on specified variables.
        - **PROC FREQ**: Used to calculate the frequency of different variables.
        - **DBMS**: Learned to specify the type of data source being imported.
        - **GETNAMES**: Used to indicate whether the first row of the data source contains column names.
        - **TABLES**: Created frequency tables for categorical data.
        - **VARNUM**: Displayed variables in the order they appear in the dataset.
4. **Data Cleaning and Transformation**:
    - Taught how to replace outliers to ensure data quality.
    - Learned to calculate basic descriptive statistics such as mean, median, mode, standard deviation, minimum, and maximum values.
5. **Advanced Data Analysis Techniques**:
    - **Indicator Matrix Preparation**: Understood how to prepare an indicator matrix for data analysis.
    - **Selection of Questions from Tool/Codebook**: Learned to select relevant questions for analysis based on the tool/codebook.
    - **Analysing Indicators**: Analysed various indicators on the current Bihar HHS data.
    - **Verification of Results**: Verified our analysis results against existing results to ensure accuracy and consistency.
    - The details of the secondary data analysis are described in the last section of this report.

These sessions provided a thorough understanding of how to use SAS software for data analysis. From learning the basics of SAS syntax and procedures to performing advanced data analysis and verification, we gained valuable skills that are essential for handling and analysing complex datasets effectively.

c. Field visits report

As part of our internship at Piramal Swasthya, we had the opportunity to participate in three significant field visits, which provided us with practical insights into healthcare programs and services.

1. **Household Survey for Maternal and Child Health (MCH) Program**:
    - Date: April 26th, 2024
    - Location: Biharsharif, Nalanda District, Bihar
    - Objective: To observe and understand the execution of a household survey focused on maternal and child health, providing us with firsthand experience of data collection and community interaction in a rural setting.
2. **Community Health Centre (CHC) Visit**:
    - Date: May 16th, 2024
    - Location: Phulwarisharif, Patna
    - Objective: To explore the operations and services of a Community Health Centre, gaining insights into the functioning of primary healthcare facilities and the challenges faced by healthcare providers and patients.

The detailed experiences and learnings from these field visits are elaborated in the following sections.

3. **Health & Wellness Centre Visit, Interaction with ASHA worker:**
    - Date: June 18th, 2024
    - Location: Health and Wellness Centre (HWC), Danapur District, Bihar
    - Objective: The primary objective of our visit to the Health and Wellness Centre (HWC) in Danapur district, Bihar, was to observe how theoretical concepts are applied in practice and assess the quality and range of healthcare services provided. We aimed to gain insights into the facility's operations, patient management, and community health initiatives.

HOUSEHOLD SURVEY REPORT

Date: 26th April 2024

Location: Biharsharif, Nalanda District, Bihar

Introduction:

This report details a household survey conducted for the Maternal and Child Health (MCH) program in Biharsharif of Nalanda District, Bihar, on April 26th, 2024.

During this visit, I observed the usage of three different questionnaires tailored for infants aged 0-5 months, 6-11 months, and 12-23 months. This report details my observations and learnings from the visit.

1) **0-5 months old:** Focused primarily on breastfeeding practices and postnatal care.
2) **6-11 months old:** Included questions about the introduction of complementary foods in addition to breastfeeding.
3) **12-23 months old:** Covered a broader range of topics including continued breastfeeding, variety in complementary foods, and growth monitoring.

Listing & Mapping Methodology:

The household listing adhered to the following protocol:

The method used for household listing and mapping was a form of systematic random sampling, ensuring a structured yet random selection process. We obtained a random number using a random number table or generator and used it to select the first household from the Anganwadi register. We decided on an interval of 4 households to be left out between selections. Starting from the initially selected household, we moved to the right side of the main door and counted 4 households, then selected the 5th household for surveying. This process was continued systematically; after surveying each selected household, we skipped the next 4 households and then selected the 5th one for the survey.

Interview 1: Mother of child age 0-5 months 29 days

The first interview involved a mother whose child was falling within the targeted age range (0-5 months 29 days). The interview instrument comprised four sections:

- **Interview Tool Sections:**
    - Basic Household Details
    - ANC & Birth Preparedness
    - Newborn Care (NBC)
    - Postnatal & Breastfeeding Practices

Key Discussion Points:

- The mother received her MCP card during the fourth month of pregnancy from an ASHA worker.
- The mother began receiving Take Home Ration (THR) from the fourth month of pregnancy.
- We assessed whether ASHA or Anganwadi workers promoted institutional delivery.
- The respondent did not complete the recommended course of Iron and Folic Acid (IFA) tablets.
- Lack of awareness about the importance of IFA tablets was noted.
- The respondent was reluctant and restless due to her child's fever.
- The interview was left incomplete as the respondent dropped out midway.
- The mother received IFA tablets from ASHA during her pregnancy, but she didn't finish them all because they gave her nausea every time she took them.

Interview 2: Mother of child age 6-11 months 29 days

The second interview involved a mother whose child was falling within the targeted age range (6-11months 29 days). The interview instrument comprised four sections:

- **Interview Tool Sections:**
    - Household and Respondent Characteristics
    - Breastfeeding and Complementary Feeding Practices
    - Immunization And Childhood Disease
    - Postnatal Contraception and Family Planning

Key Discussion Points:

- The mother was not given the ration by the Anganwadi during her pregnancy, nor was it given to the child until recently, as per the "take home ration" policy.
- The mother received IFA tablets from ASHA during her pregnancy, but she didn't finish them all because they gave her nausea every time she took them.
- Neither ASHA nor ANM offered any advice or guidelines regarding newborn care or appropriate dietary measures for the mother and child.
- Three visits were completed by the ASHA for the ANC, all on time, and the family expressed satisfaction with the ASHA's services.
- The baby was exclusively breastfed until he was nine months old, where he was supposed to start receiving semi-solid food in the sixth month.

Interview 3: Mother of child age 12-23 months 29 days

The third interview involved a mother whose child was falling within the targeted age range (12-23months 29 days). The interview instrument comprised four sections:

- **Interview Tool Sections:**
    - Household and Respondent Characteristics
    - Immunization
    - Complementary Feeding Practices
    - Postnatal Contraception and Family Planning

Key Discussion Points:

- The respondent was the mother of a 12–23-month-old child who had been staying at her parents' house for the past four months.
- No Godbharai ceremony had been conducted as per guidelines.
- Every vaccination was given at Anganwadi, however as we could see from the MCP card, they weren't given on time.
- When the immunisations were administered, the baby's height and weight were not recorded.
- **Child's Birth Weight** Initially reported as 1.5 kg but verified through the MCP card as 2.5 kg.

- The mother was unaware of THR.
- The mother didn't receive money under JSY scheme.

Confidentiality Assurance:

Before and after the interview, we assured the participants of data confidentiality and expressed gratitude for their participation.

Conclusion:

Lastly, I want to conclude that the household survey visit to Bihar Sharif provided a comprehensive understanding of how to conduct a detailed survey on maternal and child health. Understanding the structure of the questionnaire and observing the data collection process were invaluable experiences. The findings can be used to identify areas for improvement and design targeted interventions to enhance maternal and child health outcomes.

C.H.C. PHULWARISHARIF, PATNA

Date of Visit: May 16, 2024

Location: Phulwarisharif, Patna, Bihar

Population Served: Approximately 350,000 per month.

I. Introduction

This report details a field visit conducted on May 16, 2024, to the Community Health Centre (CHC) in Phulwarisharif, Patna. The CHC caters to a vast population of approximately 350,000 individuals per month (as per guidelines 1,20,000 should be covered), highlighting its crucial role in delivering primary healthcare services in the region.

It is a 24*7 Urban CHC which has approximately 50 beds and focuses primarily on Maternal and Child Health with availability of emergency room where trauma cases are stabilized and then referred to a higher hospital. Most of the high-risk pregnancies/trauma cases related or unrelated to pregnancy are referred to medical colleges like Nalanda medical college or Patna Medical college.

- **Ground Floor:**
    - **Registration Counter**
    - **Emergency Room**
    - **OPD**
    - **Immunization Room**
    - **Pharmacy**
    - **Cold Chain Storage**
- **First Floor:**
    - **Antenatal Care (ANC) Room**
    - **Non-Communicable Diseases (NCD) Cabin**

- **Family Planning Counter**
- **Laboratory**

- **Third Floor:**
  - **Triage Room**
  - **Maternity ward**
  - **Labor Room**

II. Key Observations

- No C-section availability (only normal deliveries).
- Each doctor performs approx. 170-180 OPDs every day and the doctors visit on selected 2 days of the week (and not every day).
- There is no separated department for ANCs but only a generalized area where ANCs are done by female doctors.
- There is 1 door for both entry and exit to and from the centre.
- There is 1 registration desk along with 1 dispensary for medicines.
- There is an immunization room where all immunizations are given, essential for both the mother and the baby for up to 24 months of age and we were also shown the hub cutter to explain how the used syringes are discarded.
- There we were informed about the ANMOL application which provides all the details of the couple (eligibility age >14years in Bihar), including their basic details, HRPs if any, the immunizations given and to be given etc.
- We were also briefed how immunizations are given at outreach level and talked about the RI i.e., Routine Immunization Day held on Wednesdays or Fridays in Bihar where immunizations are given at Centres (HWCs) by the combined effort of FRWs (ANMs, ASHAs, Anganwadis).
- We were told about how the vaccines are dispensed to the centres on VHSNDs and the remaining ones brought back, and the struggles faced by ASHAs with motivating pregnant women to come to the centre on those specific days and get vaccinated.
- We were also shown the MCP card in the immunization room and educated about the importance of the same in recording all the necessary details and keeping a record of future ANCs and immunization visits.
- We were informed about the 4 key messages given to mother during outreach immunizations including which vaccination, when will the next one be given, possible side effects and the remedies.
- We were informed about the eWIN portal and its importance in maintaining the viability of the vaccines and about how the vaccines are brought from State warehouses to District warehouses through Vans.
- We were explained about Cold Chain which is the process of storing and transporting vaccines at recommended temperatures from the point of manufacture to the point of administration and the

Ice-Lined Refrigerator (ILR) which is a type of refrigerator commonly used in the storage and transportation of vaccines during the cold chain process and how they play a role in providing good quality viable vaccines.

- We were also shown the Blood Bank Refrigerator (BBR) in the storage room which stores all the essential medicines that require temperature regulation like Oxytocin.
- We were shown the storage room of all the medicines and drugs which were kept on a raised surface since as per guidelines no box of medicines should touch the floor.
- We were also explained briefly about the Green Channel and AVD (Alternate Vaccine Delivery).
- Then we were taken to the Family Planning Section on First floor where the Staff explained us the entire process of Family Planning Counselling, Basket of choice and all the permanent and temporary methods of birth spacing suggested to women.
- We were also shown the 3 kinds of birth control pills including Emergency pills, Chhaya pills and Mala-N and explained the differences between the three.
- Injection Antara pregnancy which is an injectable contraceptive was also shown.
- Then we were explained about the importance and role of MAMTA in pregnancy care outside maternity ward and got the opportunity of attending a MAMTA counselling session.
- We were taken to the Labor room which had 3 beds and were shown the Labor Room register which had 81 questions covering all the information about the mother and the newborn.
- Approx. 8-10 deliveries/day take place at this CHC.

Outreach Activities and Routine Immunization Process:

- After showing around the entire facility and all the departments we had a discussion with the Block Hospital Manager who shared her experiences along with the problems faced with managing patient and family behaviour.
- She also explained the entire outreach immunization process including VHSND, along with how the service coordination takes place between different departments, coordination between Frontline workers Anganwadis, ASHAs, ANMs during RIs.
- She explained how these Frontline Workers are paid and incentivized and how they are required to give proof of all the services provided before getting paid. She also explained how different incentives are given for easy to reach, hard to reach, very hard to reach areas.
- She shared problems (like absence of bank account) that occur with providing mothers with the financial benefits offered by the govt. for the girl child and how all the gaps need to be reported with specific reasons.
- She explained how shortage of ASHAs and ANMs in the area is tackled by posting other area ASHAs in the area and how the reluctance among them is handled with issuing notices.
- She explained how separate sessions are taken every week for counselling and educating ASHAs, ANMs, MAMTAS related to their jobs and responsibilities and additional roles required to be performed by them as per any new guidelines issued.

- She explained how CHC is responsible for looking after the functioning and services of HWCs of the area and how the entire functioning is carried out under their supervision.
- She explained how maternal or newborn deaths are enquired by sending a proper team to the household and asking and recording all the necessary questions on a definite form and how it is reported to the concerned authority so that appropriate actions can be taken to avoid the same in future.
- She also explained how the team from CHC carries out the different immunization and health checkup programs at different kinds of facilities (like currently for NCC in the nearby school).

Conclusion

A significant portion of the population's healthcare needs are met largely by the Phulwarisharif Community Health Centre. Delivering public health in a well-rounded manner is highlighted by the emphasis on mother and child health, in addition to preventive, curative, and emergency care, as well as outreach initiatives.

Report on the Visit to Health and Wellness Centre in Danapur District, Bihar

Date of Visit: June 18th, 2024
Location: Health and Wellness Centre (HWC), Danapur District, Bihar
Population Served: 10,206

Overview

The Health and Wellness Centre (HWC) in Danapur district is a vital healthcare facility catering to the needs of a population of 10,206. The centre is well-maintained and fully functional, providing a wide range of health services aimed at health promotion, early identification of diseases, treatment, follow-up care, and referrals to the Community Health Centre (CHC) Pulwarisharif to ensure continuity of care.

Facilities and Services

 Care in Pregnancy and Childbirth: The HWC offers comprehensive care before and after childbirth, including regular check-ups, nutritional support, iron and folic acid supplements, and health education. They focus on ensuring safe deliveries and maternal health.

 Neonatal and Infant Health Care Services: The centre provides early childhood immunizations, growth monitoring, and health check-ups to reduce infant mortality and support healthy development.

 Childhood and Adolescent Health Care Services: The HWC offers immunizations, nutritional support, and health education for children and adolescents. They also provide counselling on puberty, mental health, and hygiene.

 Family Planning and Reproductive Health Services: The centre provides counselling and various contraceptive methods, along with other reproductive health services, promoting overall family health.

 Non-Communicable Disease Management: The HWC has a dedicated area for screening and managing chronic diseases like diabetes, hypertension, and heart conditions, ensuring organized follow-up care.
 Emergency Medical Services: The centre is equipped to handle emergencies, providing first aid, stabilization, and efficient referrals to the Community Health Centre (CHC) Pulwarisharif, enhancing community health security.

Key Observations:

1. **General Functionality**
    - The HWC operates from 10 AM to 5 PM, with the Community Health Officer (CHO) present until 2 PM.
    - The centre handles a patient flow of 20-25 patients daily, with the last month's outpatient department (OPD) visits totalling 633.
    - A dedicated corner for Non-Communicable Disease (NCD) screening is available, highlighting the centre's commitment to managing chronic conditions.
2. **Teleconsultation Services**
    - The HWC provides teleconsultation services, with 250 teleconsultations conducted in the past month.
3. **Patient Follow-Up**
    - Follow-up for NCD patients is diligently managed, with 33 follow-ups recorded last month.
4. **Sanitation and Health Promotion**
    - The centre is equipped with color-coded dustbins to ensure proper waste segregation.
    - Numerous charts and boards are displayed for patients, offering information on various health programs and services available at the HWC, as well as important health messages.
5. **Pharmaceutical Services**
    - The HWC stocks all 14 essential drugs required, along with many other medications to cater to diverse health needs.
6. **Infrastructure**
    - The centre consists of one main room where the CHO operates. The CHO, who holds a BSc in Nursing and is a native of Bihar, faces no language barriers when communicating with the local community.
    - A separate section, divided by a half wall, contains a small bed designated as a lab area.
7. **Community Health Information**
    - The names and contact numbers of all Auxiliary Nurse Midwives (ANMs) & ASHAs are displayed on the front wall of the HWC.
    - A box containing contraceptives, such as condoms, is mounted on the wall for easy access.
    - A neat and clean handwashing and drinking water station is positioned at the entrance, reflecting the centre's emphasis on hygiene.

- Another board provides detailed information about the Accredited Social Health Activists (ASHAs), including their codes, session sites, mobile numbers, details of Anganwadi workers, CHO's details, and the Village Health Sanitation and Nutrition Day (VHSND) plan.

Observations

During the visit, we had the opportunity to speak with the CHO, who provided valuable insights into the centre's operations. The CHO was actively attending to patients, most of whom were being treated for NCDs, fever, cough, cold, and heatwave-related issues. The presence of comprehensive healthcare services, dedicated staff, and a well-maintained facility underscores the HWC's role in improving the health and well-being of the Danapur community.

Conclusion

The Health and Wellness Centre in Danapur district is a cornerstone of the local healthcare system, offering essential services and maintaining high standards of care and hygiene. The facility's efforts in health promotion, disease prevention, and management, along with its robust teleconsultation and follow-up services, significantly contribute to the health security of the local population. The dedication of the staff and the comprehensive range of services provided are commendable, making the HWC a model for community health care.

Meeting with ASHA

During this field visit to Danapur, we had the opportunity to interact closely with an Accredited Social Health Activist (ASHA) who has been serving the community diligently for the past 19 years. Her name was Hemanti Devi, and she was a graduate. ASHAs are pivotal in bridging the gap between healthcare services and rural populations, particularly focusing on maternal and child health, nutrition, and preventive care.

ASHA shared her extensive responsibilities which included:

Maternal and Child Health: She provides crucial support to women during pregnancy, emphasizing birth preparedness, safe delivery practices, and postnatal care. She ensures women attend Ante Natal Check-ups and Post Natal Check-ups and promotes breastfeeding, immunization, and nutrition for both mothers and young children.

Community Mobilization: She mobilizes the community to utilize government health services available at Anganwadi centres, sub-centres, and primary health centres. This includes facilitating immunization drives, supplementary nutrition programs, and promoting sanitation and hygiene practices.

Health Education: She educates the community on health determinants such as nutrition, sanitation, and healthy living. She also provides information on family planning methods, contraception, and prevention of infections. She visits door to door to provide the "Nayi pahel kit" to the newly wed couples to promote family planning.

Special Initiatives: She organizes events like 'Godhbharai' to enhance maternal nutrition and 'Saas Bahu Sammelans' to educate young brides about family planning.

Additionally, she coordinates Village Health Sanitation and Nutrition Day (VHSND) for immunization and health monitoring.

Reporting and Training: Every month, on the first Thursday, the Asha facilitator and the BMC of the district come together. They discuss topics such as reporting on ASHAs, giving feedback, introducing new programs or schemes for implementation, and ensuring the distribution of necessary instructions and supplies for Health and Wellness Centres (HWC).

Data Collection and Reporting: She maintains records of health-related information such as births, deaths, immunizations, and health status of community members. This data is crucial for monitoring health trends, planning interventions, and evaluating health programs.

Newborn and Child Care: ASHA monitors the growth and development of newborns and young children, promotes timely immunization, and provides counselling on child nutrition and care practices to mothers and caregivers. She also assists in identifying malnourished children in the community and refers them to the Nutrition Rehabilitation Centre (NRC). Here, both the mother and child receive necessary care, observation, and nutritional support to facilitate their recovery. Typically, beneficiaries stay at the NRC for a minimum period of 15-21 days to ensure they receive adequate treatment and rehabilitation.

Technological Use: She was trained in using a government app for reporting her work during each month so that she must be provided with the incentives while earlier she used to maintain a register of her work. Currently technical issues have impacted functionality for the past two months.

While ASHA plays a critical role in rural healthcare delivery, but they encounter several challenges that impact their effectiveness and well-being and same was the case of Hemanti Devi.

Financial Instability: ASHAs are compensated based on incentives rather than a fixed salary. This financial model, while intended to motivate performance, often results in inconsistent earnings that are insufficient to cover their expenses. She told us about her earnings. For instance, she earns Rs. 100 for ANC and Rs. 600 for the entire delivery process which does not adequately support her livelihood, especially considering the extensive time and effort she invests in her duties.

Community Resistance and Cultural Barriers: She told us about the resistance she faces from certain segments of the community, particularly regarding cultural beliefs and traditions that influence health-seeking behaviour. Overcoming these barriers requires not only persistence but also sensitivity and cultural competence to build trust and acceptance which she had overcome as she is serving the community from the past 19 years and now everyone in the community is well aware about her performance and they all appreciate her efforts.

Workload: She often manages large caseloads and faces demanding work schedules that include home visits, community mobilization, health education sessions, and administrative tasks. The cumulative stress and physical demands contribute to burnout, affecting her morale and performance over time.

Recognition and Support: Despite her pivotal role in improving maternal and child health outcomes, she sometimes lacks adequate recognition and support from local authorities and healthcare systems. This includes insufficient logistical support, delayed reimbursements, and limited opportunities for career progression or advancement within the healthcare sector.

In conclusion, our visit to the Health and Wellness Centre in Danapur district, Bihar, offered profound insights into the pivotal role of healthcare facilities and committed individuals like Hemanti Devi, an Accredited Social Health Activist (ASHA). The centre demonstrates effective healthcare delivery across various essential services including maternal and child health, neonatal care, family planning, management of non-communicable diseases, and emergency medical services. Despite their commendable efforts, ASHAs such as Hemanti Devi encounter significant challenges such as financial instability, community resistance, and heavy workloads, highlighting the urgent need for increased support and recognition within the healthcare system. Furthermore, the Chief Health Officer (CHO) at the centre, with a background in BSc Nursing and local familiarity, plays a commendable role in bridging communication gaps and ensuring seamless patient care. The CHO's leadership contributes significantly to the centre's operational efficiency and patient satisfaction, underscoring the importance of investing in skilled healthcare personnel to sustain and enhance healthcare services at the grassroots level in Danapur district.

d. Experience from other projects/activities

Experience from Slide Deck Preparation Project

During my internship at Piramal Foundation, I had the opportunity to work on a significant project involving the preparation of a slide deck for the Household Survey conducted from 2018 to 2024. This project provided valuable insights and practical skills in data presentation and integration.

1. **Data Integration and Update**:
    - Task: Update slides with the latest data from the 2024 Household Survey.
    - Process: Incorporated data from the provided Excel sheet into the slides, ensuring accurate representation through graphs and charts.
    - Learning: Gained understanding of how to integrate Excel data with PowerPoint to create dynamic and up-to-date presentations.
2. **Presentation Enhancement**:
    - Task: Transition slides from the previous branding (Care) to the new branding (Piramal).
    - Process: Edited slides to align with Piramal's branding, including changing logos, color schemes, font sizes, and styles.
    - Learning: Developed skills in making presentations visually appealing and consistent with branding guidelines.

3. **Data Review and Highlighting Deviations**:
    - Task: Identify and mark significant deviations in data from previous years.
    - Process: Reviewed and highlighted more than 3-5% deviations in red in the Excel sheet for further review by authorities.
    - Learning: Enhanced attention to detail and understanding of the importance of highlighting key data changes for decision-making.
4. **Focus on Maternal Health**:
    - Specific Contribution: Worked primarily on the slides related to Maternal Health.
    - Process: Ensured that the data and visualizations accurately reflected the trends and changes in maternal health over the survey period.
    - Learning: Gained in-depth knowledge about maternal health indicators and the importance of accurate data representation in healthcare presentations.

This project not only improved my technical skills in Excel and PowerPoint but also taught me the importance of clear and accurate data presentation in influencing healthcare decisions.

1. Desk Review related to my topic (Literature Review)

a. Background

Intrapartum and Postnatal care among mothers of infants aged 0-2 months

INTRODUCTION:

Intrapartum period is the time period spanning childbirth, from the onset of labor through delivery of the placenta. Intrapartum can refer to both the woman and the fetus. [1] Intrapartum care covers the care of women and their babies during labour and immediately after birth. It focuses on women who give birth between 37 and 42 weeks of pregnancy ('term').[2]

The terms "postpartum period" and "postnatal period" are often used interchangeably but sometimes separately, when "postpartum" refers to issues pertaining to the mother and "postnatal" refers to those concerning the baby. The ***postnatal period*** begins immediately after the birth of the baby and extends up to six weeks (42 days) after birth. [3]

Maternal mortality remains a major public health concern worldwide, especially in developing countries, hence its mention in the top 5 millennium development goals (MDGs) and in sustainable developmental goals (SDGs). Maternal mortality ratio (MMR) reduced from 556 per 100,000 live births in 1990 to 130 per 100,000 live births in 2016, but despite the considerable improvement in maternal mortality, India still continues to contribute one-fifth of the global burden of absolute maternal deaths. Basic maternal services such as antenatal care (ANC), skilled birth attendance, intrapartum care, and postnatal care (PNC) are crucial for reducing and managing pregnancy complications, and for reducing the burden of these preventable deaths. World Health Organization (WHO)

recommends that three elements of maternal health namely four or more ANC visits, delivery assisted by skilled birth attendants (SBAs), and three postnatal checkups are pivotal in any safe motherhood program in a developing country like India.[4]

Ending all preventable newborn deaths and reducing neonatal mortality to as low as 12 per 1000 live births by 2030 is the target of the United Nations' third Sustainable Development Goal (United nations, 2018). The World Health Organization (WHO) devised a comprehensive strategy of essential newborn care (ENC) intending to improve the health of newborns through interventions. Although WHO has implemented ENC as of 2004, contrary to objectives of the program, inappropriate breastfeeding practices, malnutrition, and lack of knowledge regarding newborn care among mothers has resulted in higher neonatal mortality.[5]

Inadequate quality of care, including insufficient facility readiness, and low provider skill and clinical management capacity, as evidence from low/middle-income countries (LMIC) indicates, may explain why increased utilisation alone may not have resulted in the desired reduction in adverse intrapartum outcomes.[6]

High-quality care during pregnancy, labor, delivery, and the immediate postpartum period is crucial for reducing maternal and neonatal mortality.

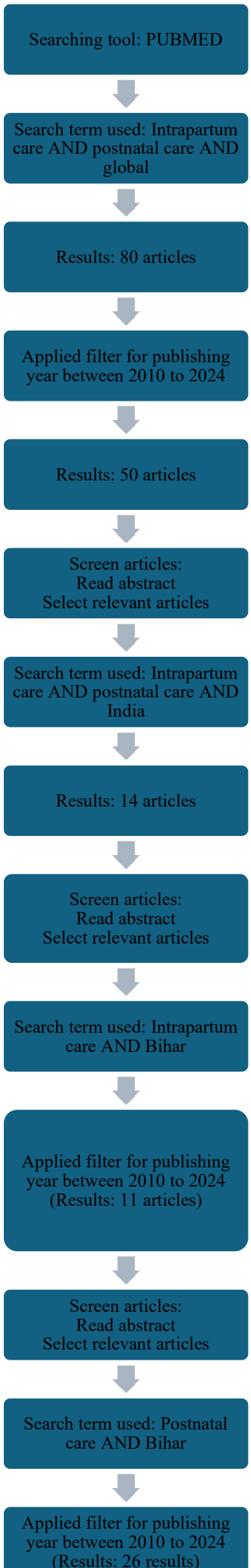
India has made significant progress in reducing maternal and new-born mortality since 2005. The health systems reforms implemented nationwide as part of the National Health Mission have averted millions of new-born deaths and saved the lives of thousands of women. Despite this declining trend, the burden of maternal and neonatal mortality remains high. The current Maternal Mortality Ratio (MMR) is 97 per 100,000 live births, and the neonatal mortality rate (NMR) is 20 per 1000 live births [3, 4]. Almost half the maternal deaths, 40% of all stillbirths, and neonatal deaths occur during labor, on the day of birth. This happens despite having a roster of proven interventions and technologies that can effectively address the causes of perinatal mortality [6–8]. While the inequitable arrangements of service delivery and inefficient health systems can be considered the root cause, poor quality of care is one of the significant contributors to the excess mortality among mothers and children.[7]

OBJECTIVE/AIM:

This work aims to identify gaps in the Indian public health system, especially in Bihar, in providing quality intrapartum and postnatal care. This is essential for evaluating the impact of current maternal and newborn health policies and setting priorities for future health system improvements.

METHODOLOGY:

A search using the PubMed database was conducted to identify relevant research articles. The 1st search term employed was **“intrapartum AND postnatal care AND Global”** which yielded 80 articles. Filter was applied to limit the search to studies published between 2010 and 2024 which gave 50 articles. Boolean operator "AND" was used to ensure all terms were present in the articles. Then search term “**Intrapartum care AND Postnatal care AND India"** was used which gave 14 articles. Later **“Intrapartum care AND Bihar”** (11 results) & **“Postnatal care AND Bihar”** (26 results) search terms were used to find additional articles. Filters were applied to limit the search to studies published between 2010 and 2024 in all searches. No MeSH terms were used to capture a broader range of articles.


Searching tool: PUBMED
Search term used: Intrapartum care AND postnatal care AND global
Results: 80 articles
Applied filter for publishing year between 2010 to 2024
Results: 50 articles
Screen articles:
Read abstract
Select relevant articles
Search term used: Intrapartum care AND postnatal care AND India
Results: 14 articles
Screen articles:
Read abstract
Select relevant articles
Search term used: Intrapartum care AND Bihar
Applied filter for publishing year between 2010 to 2024
(Results: 11 articles)
Screen articles:
Read abstract
Select relevant articles
Search term used: Postnatal care AND Bihar
Applied filter for publishing year between 2010 to 2024
(Results: 26 results)

b. Evidence table

Paper title	Journal	Year	Study Design	Study Population	Sample Size	Link	Outcomes measured	Summary	Methodology	Main findings	Research Gaps	Recommendations
Statewide implementation of a quality improvement initiative for reproductive, maternal, newborn and child health and nutrition in Bihar, India	Journal of Global Health	2014-2017	Observational study. Descriptive and Analytical	The study population consists of individuals in the state of Bihar, India	Sample size is 532 in 2015 and 549 in 2017, based on data from two public facility assessments.	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7759019/	The performance of critical practices in EmONC facilities following mentoring and training intervention, the percentage of deliveries in public and private facilities, the percentage of women receiving critical screenings during prenatal care, and the prevalence of critical newborn care practices in public and private sector facilities are among the outcomes measured in the study.	The paper discusses the successful implementation of a quality improvement initiative in Bihar to improve RMNCHN services, highlighting significant progress and the need for continued improvement guided by data.	The methodology involved reviewing program documents, analyzing data from facility assessments, provider training interventions, and household surveys to assess the QI strategies and their outcomes. The study used ₂ 2 tests to analyze differences in data between 2015 and 2017.	The main findings include the formation of District Quality Assurance Committees and QI teams, improvements in facility infrastructure and staff distribution, significant enhancements in key practices post-training, and a shift towards more deliveries in public facilities compared to private facilities.		The paper offers comprehensive policy recommendations that highlight the need for ongoing development of the QI platform, creating a culture of patient safety and high-quality care, and customizing approaches to local circumstances.
Simulation and team training embedded nurse mentoring programme and improvement in intrapartum and newborn care in a low resource setting in Bihar, India	Journal of Global Health	2017	Observational study. Pre and Post Comparison Study	The study population consists of individuals in the state of Bihar, India	668 NSVDs from 289 public health facilities in Bihar that were observed for intrapartum and newborn care practices.	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7759019/	The outcomes measured in the study include facility-level intrapartum and newborn care composite scores based on evidence-based practice indicators.	Climate literacy and climate education may be helpful in raising awareness among children about climate change and its many ramifications.	Utilized information from CARE-India's concurrent assessment platform for the Government of Bihar's AMANAT program, the Facility Information System (FIS), and the Department of Defence (DOD).	Significant improvement in facility-level intrapartum and newborn care practices after the AMANAT nurse-mentoring program. Simulation and team-training played a crucial role in enhancing intrapartum care practices. Overall, there was a substantial increase in intrapartum and newborn care scores following the implementation of the program.	To guide sustainability and scalability efforts, it is essential that mentoring programs be thoroughly assessed as they are introduced throughout India. To determine the ideal content, dosage, and duration of mentoring programs, it is also necessary to examine the relative significance of various program elements, including team building exercises, didactics, bedside mentoring combined with simulation, and skills and drills.	
Trends, Differentials, and Social Determinants of Maternal Health Care Services Utilization in Rural India: An Analysis from Pooled Data	Womens Health Rep (New Rochelle).	2020	Observational study	Women from rural India who have utilized maternal health care services		https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9380883/	Four or more antenatal care visits, skilled birth attendance, and postnatal care	The paper discusses the importance of maternal health care services, the factors influencing their utilization, and the need to address disparities to achieve sustainable development goals related to maternal mortality in rural India.	The methodology involved analyzing utilization trends using descriptive statistics and conducting binary logistic regression analysis on pooled data from three rounds of the National Family Health Survey, which are nationally representative surveys covering over 99% of the Indian population.	Certain socioeconomic factors are associated with low utilization of maternal health care services despite an Overall increase in utilization rates. Addressing socioeconomic determinants is crucial to achieve the goal of reducing maternal mortality. There is a positive trend in the utilization of antenatal care visits, skilled birth attendance, and postnatal care over the years studied.		The policy recommendations based on the study include addressing socioeconomic determinants such as illiteracy, advanced maternal age, high parity, belonging to scheduled tribes, rural residence, and lack of possession of a health card to improve maternal health care utilization. Additionally, there is a need to focus on various socioeconomic factors to achieve the sustainable developmental goal of reducing maternal mortality. The study underscores the importance of considering socioeconomic and demographic factors in maternal health care utilization to bridge existing gaps and improve outcomes. It is recommended to continue monitoring and addressing these determinants to ensure progress towards improving maternal health care services in rural India.

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Trends, Differentials, and Social Determinants of Maternal Health Care Services Utilization in Rural India: An Analysis from Pooled Data	Womens Health Rep (New Rochelle).	2020	Observational study	Women from rural India who have utilized maternal health care services		https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9380883/	Four or more antenatal care visits, skilled birth attendance, and postnatal care	The paper discusses the importance of maternal health care services, the factors influencing their utilization, and the need to address disparities to achieve sustainable development goals related to maternal mortality in rural India.	The methodology involved analyzing utilization trends using descriptive statistics and conducting binary logistic regression analysis on pooled data from three rounds of the National Family Health Survey, which are nationally representative surveys covering over 99% of the Indian population.	Certain socioeconomic factors are associated with low utilization of maternal health care services despite an Overall increase in utilization rates. Addressing socioeconomic determinants is crucial to achieve the goal of reducing maternal mortality. There is a positive trend in the utilization of antenatal care visits, skilled birth attendance, and postnatal care over the years studied.		The policy recommendations based on the study include addressing socioeconomic determinants such as illiteracy, advanced maternal age, high parity, belonging to scheduled tribes, rural residence, and lack of possession of a health card to improve maternal health care utilization. Additionally, there is a need to focus on various socioeconomic factors to achieve the sustainable developmental goal of reducing maternal mortality. The study underscores the importance of considering socioeconomic and demographic factors in maternal health care utilization to bridge existing gaps and improve outcomes. It is recommended to continue monitoring and addressing these determinants to ensure progress towards improving maternal health care services in rural India.

Paper title	Journal	Year	Study Design	Study Population	Sample Size	Link	Outcomes measured	Summary	Methodology	Main findings	Research Gaps	Recommendations
Can Flip-Chart Assisted Maternal Education Improve Essential New Born Care Knowledge and Skills? A Randomized Controlled Trial	Maternal and Child Health Journal	2016-2017	Randomized controlled trial with a single-blind parallel design	Primigravida women (women who became pregnant for the first time) who vaginally delivered full-term babies weighing 2500 gm or more were included in the immediate postpartum period after informed consent.	The sample size in the study was 120 participants, with 60 participants in each group.	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9374615/pdf/10995_2022_Article_3403.pdf	The main or primary outcome measured in the study is the impact of postnatal flip-chart-assisted maternal education on ENC skills of mothers.Knowledge scores at the end of 6 months, exclusive breastfeeding rates, warm care practices, hand hygiene practices, ability to recognize danger signs in newborns, incidence of illness among infants,	The paper evaluates the effectiveness of flip-chart assisted postpartum maternal education in improving essential newborn care knowledge and skills, highlighting persistent knowledge gaps among postpartum women and demonstrating sustained effects of the intervention for 6 months post-delivery.	The methodology involved a single-blind parallel randomized controlled trial with 120 primigravidae, allocation to intervention and control groups, administration of a pretested questionnaire within 24 hours post-delivery, flip-chart assisted education for the intervention group, observation of ENC skills, assessment of knowledge retention after 6 months, and data analysis using IBM SPSS. Statistical tests like Mann-Whitney U, Wilcoxon signed-rank, Spearman's correlation, and chi-squared test were used for analysis.	Postnatal flip-chart-assisted maternal education significantly improved ENC skills and knowledge retention for 6 months. The intervention group showed enhanced breastfeeding techniques, warm care skills, hygiene practices, and better recognition of danger signs in newborns compared to the control group. Maternal education immediately after delivery had a lasting impact on ENC knowledge and practices, leading to reduced rates of illness in early infancy.	Lack of universal adoption of exclusive breastfeeding and good essential newborn care practices. Loss of knowledge and skill domains after antenatal education due to a long interval between education and practical application. Ineffectiveness of healthcare workers in caring for lactating mothers, leading to lower scores in knowledge and skill domains. Breastfeeding and EBF failure were the result of mothers' anxiety brought on by advice that did not take into account the expectations and experiences of primiparous	Employee ENC training that will preserve consistency in the knowledge and abilities imparted on ENC. Following the ENC practice on their newborns, mothers will also have the chance to address any questions or concerns they may have.
Evaluating the effect of care around labor and delivery practices on early neonatal mortality in the Global Network's Maternal and Newborn Health Registry	Patel et al. Reprod Health	2010-2013	Observational study	The study population consists of pregnant women enrolled in the MNHR between 2010 and 2013, across multiple sites including Argentina, Guatemala, India (Nagpur and Belgaum), Pakistan, Kenya, and Zambia.	150,848 live births.	https://pubmed.ncbi.nlm.nih.gov/33256730/	Early neonatal mortality rates (days 0-6 of life) and its association with the presence of all 8 Care Around Delivery (CAD) indicators.	The paper discusses the importance of specific care practices during delivery in reducing neonatal mortality and the need for a composite index to measure the effectiveness of Essential Newborn Care practices, highlighting a 19% reduction in neonatal mortality with the presence of all 8 Care Around Delivery indicators.	NICHD's Global Network's (GN) Maternal Newborn Health Registry (MNHR) regularly collected data on five intrapartum and three post-partum practices (indicators) recommended as part of ENC between 2010 and 2013. Researchers assessed whether lower early neonatal mortality rates (days 0–6) were linked to all eight practices (Care around Delivery, or CAD) taken together as an index.	The chance of neonatal death was found to be reduced by 19% when all eight Care Around Delivery (CAD) indicators were present.	It is difficult to compare results among different states because of differences in design and approach and outcomes. To address priority measures, guidance is required. This study suggests that not all clinically significant CAD practices may improve the outcomes for the babies in the same way. Therefore, creating composite indices of indicators is difficult.	In order to lower avoidable newborn deaths, these indicators could be used to identify facilities that require greater compliance to ENC practices. To enhance the quality of care surrounding delivery and improve neonatal outcomes, more research is required to identify and rank the indicators. In order to enable quick quality assessment and implement data-driven action to improve outcomes, concentrate on creating straightforward and reliable indicators of facility-based quality of care at the time of birth. Evaluating additional factors like the availability of supplies, equipment, and medications in various locations, which may be crucial for improving the measurement of quality of care globally, and further streamlining the WHO checklist to a more condensed set of indicators that have the greatest impact on neonatal mortality.

Paper title	Journal	Year	Study Design	Study Population	Sample Size	Link	Outcomes measured	Summary	Methodology	Main findings	Research Gaps	Recommendations
Can India's primary care facilities deliver? A cross-sectional assessment of the Indian public health system's capacity for basic delivery and newborn services	BMJ Open		Cross-sectional study		9536 primary health centers (PHCs) and 4810 community health centers (CHCs) in India	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5989146/pdf/bmjopen-2017-020532.pdf	As a measure of the minimum facility capacity for intrapartum care, a summative index of 33 structural and process capacity items that matched the Indian Public Health Standards for PHCs was used. Next, they evaluated how different facility types and locations performed on this index.	The paper highlights the weak capacity of Indian public primary care facilities in providing basic intrapartum care, especially in rural and urban areas, with critical deficiencies in routine and emergency care practices, infrastructure, and staffing. It emphasizes the need for focused attention on quality measurement, accountability mechanisms, and quality improvement to improve maternal and newborn health outcomes.	The methodology involved using data from the DLHS-4 for PHCs and CHCs, developing a summative index based on IPHS standards, and utilizing self-reported and observed measures for structural and process capacity indicators. The study focused on 33 elements matching IPHS for PHCs, with CHCs assumed to meet similar standards. The availability of skilled providers, the availability of a functional labor room, the availability of emergency medications and labor supplies, and the availability of delivery and newborn care supplies were the four subdomains into which structural inputs were divided. Reports from survey respondents (facility managers or medical officers in charge) on the availability of assisted vaginal deliveries; parenteral oxytocins, antibiotics, and magnesium sulfate administration; postpartum hemorrhage management; newborn resuscitation; and thermal protection services were among the process capacity indicators.	A little over 30% of PHCs and 5% of CHCs reported they did not provide any intrapartum care. The greatest gaps were in the supply of emergency obstetric services and availability of skilled human resources. Both in rural and urban areas, public primary care facilities in India lack the basic intrapartum care capacity, with the poorest states having the worst health outcomes.	Due to data limitations, the index was devoid of information on important interpersonal and technical care processes, such as provider competency. There was limited information on the quality of referral care and no private facilities in the sample. The use of basic emergency care procedures for mothers and newborns (signal functions) and adherence to international guidelines for routine deliveries would have been ideal examples of how to assess the quality of clinical care given to women in public health facilities. They were unable to locate a corresponding survey question in the DLHS facility audit for 15 of the 48 intrapartum care items on the IPHS.	The policy recommendations in the paper include the need for focused attention on quality measurement, accountability mechanisms, and quality improvement in order to improve maternal and newborn health outcomes. Additionally, policies addressing deficits in skilled providers and emergency service availability are urgently required.
Appraising LaQshya's potential in measuring quality of care for mothers and newborns: a comprehensive review of India's Labor Room Quality Improvement Initiative	BMC Pregnancy and Childbirth		Observational study, Descriptive study, Comparison Study			https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10993574/pdf/12884_2024_Article_6450.pdf	This study aims to review LaQshya's capacity to evaluate the quality of care provided to mothers and newborns. Improvements to LaQshya's effectiveness will be guided by the findings. Clinical complications reduction, quality of care enhancement	The paper provides a comprehensive review of India's Labor Room Quality Improvement Initiative (LaQshya) and its ability to assess the quality of care for mothers and newborns, positioning LaQshya as a powerful model for evaluating quality of care. The study suggests actions to enhance LaQshya's effectiveness, including strengthening governance structures, transformative training for clinical providers, and	The methodology involved a two-step approach: a descriptive analysis using document reviews and a comparison of LaQshya's measurement parameters with WHO Standards for Maternal and Newborn Care.	The LaQshya checklists cover and evaluate 269 (76%) of the 352 WHO quality measures. The comparative analysis demonstrates that LaQshya has a better capacity for quality assessment in maternal and newborn care compared to other tools.	Limited scope and depth of existing studies on LaQshya, absence of comparative analysis against global standards, deficiencies in assessment checklists aligning with implementation challenges. Through assessments of rights, experience, and mistreatment, it does not fully measure quality from the viewpoint of the patient. A few more components that are lacking are clinical leadership skills, referral outcomes, and critical concerns of harmful practices and evidence-based care during labor.	The policy recommendations include strengthening district governance structures, offering tailored training programs for respectful maternity care (RMC) and other quality processes, and expanding quality measurement metrics to assess provider accountability, patient outcomes, rights, staff supervision, and health facility leadership.
The impact of COVID-19 on the provision of respectful maternity care: Findings from a global survey of health workers	Women and Birth	2020-2021	Observational study	The study population consists of health workers, mainly midwives, obstetricians, gynaecologists, nurses, and general practitioners, who self-identified as providing maternal and newborn care services during the COVID-19 pandemic across the	From the total 1248 maternal and newborn health workers who participated in the second survey round, 1127 (90.3%) participants from 71 countries responded to the respectful care question.	https://pubmed.ncbi.nlm.nih.gov/34531166/	Impact of the COVID-19 pandemic on the provision of respectful maternity care.	training for clinical providers, and The paper discusses the importance of respectful maternity care (RMC) as defined by the WHO, the health system barriers jeopardizing the promotion of RMC, the impacts of the COVID-19 pandemic on maternal and newborn care, and the negative effects of the pandemic on RMC globally.	The methodology involved data collection through an online questionnaire developed by a team of experts, data cleaning in Microsoft Excel, translation of non-English responses, and qualitative data analysis using content analysis.	The study emphasizes the importance of promoting respectful maternity care to reduce global inequities in maternal and neonatal health through health system strengthening. Health workers reported barriers to promoting RMC in health facilities, and compromised standards of care, including RMC, due to measures taken to limit SARS-CoV-2 transmission.	during care during labor.	The paper emphasizes the importance of documenting how the COVID-19 pandemic affected the provision of Respectful Maternity Care (RMC) to prepare for future health system shocks and develop evidence-based strategies.
Small Area Variation in the Quality of Maternal and Newborn Care in India	JAMA Netw Open	2019-2021	Cross-sectional study		Consists of women aged 15 to 49 years who had the most recent birth (singleton or multiples) in the 5 years preceding the survey, with data obtained from the 11th National Family Health Survey covering all 707 districts in India.	https://pubmed.ncbi.nlm.nih.gov/36441555/	•Children's view of the environment as a moral concern •Children's commitment to environmental engagement later in life •Decreasing environmental concern in adolescence	The summary of the paper is that the study aimed to quantify the variation in the quality of maternal and newborn care across different geographic levels in India, highlighting the importance of small areas in implementing effective policies and the need to consider individual care components separately. The findings suggest a need for revising the current district-focused approach and prioritizing districts with low-quality care and high inequality.	The methodology involved using data from the NFHS, evaluating ANC and PNC components, and employing logistic and linear regression models to analyze the quality of maternal and newborn care.	Small areas within districts showed the largest variation in the quality of maternal and newborn care, emphasizing the importance of focusing on smaller geographic units for policy interventions. Quality of care was lower in districts, with greater variation in northern parts of India, highlighting the need for targeted improvements in these regions. Districts with lower-quality care tended to have higher levels of between-small area inequality, indicating the need for more precise targeting of interventions within districts. Aspirational districts scored higher in between-small area SD and lower overall in the district composite score. The difference was small when compared to nonaspirational districts; only one-third of aspirational districts overlapped with districts identified as needing		The paper recommends revising the current district-focused approach, prioritizing districts with low composite quality scores and high between-small area variation for policy attention to improve maternal and child health outcomes and reduce geographic inequality.
Use of antiseptic for cord care and its association with neonatal mortality in a population-based assessment in Bihar State, India	BMJ Open	2014	Population-based cross-sectional study	Households in 1017 clusters in Bihar	A representative sample of 12 015 women with a live birth in the last 12 months were interviewed from all 38 districts of Bihar	https://pubmed.ncbi.nlm.nih.gov/28122828/	Applying multiple logistic regression to examine the relationship between the use of antiseptic cord care at birth and neonatal mortality.	The paper discusses the association between antiseptic cord care, particularly with gentian violet, and lower neonatal mortality rates in Bihar, India, emphasizing the potential benefits of antiseptic use despite the official recommendation for dry cord care.	The methodology involved a multistage stratified random sampling approach, data collection on pregnancy outcomes, data analysis using STATA software, examination of associations using multiple logistic regression, assessment of correlation between variables, presentation of odds ratios with 95% CIs, and determination of significance with ₂ 2 test.	Despite the fact that dry cord care is advised by Indian health authorities, half of the study's participants reported using antiseptics, primarily gentian violet, for cord care, and that these users reduced neonatal mortality. These results imply that further research should be done to determine whether applying easily accessible gentian violet for cord care in less developed settings can reduce the risk of neonatal mortality.	It was not recorded when or by whom an antiseptic was used, nor was the frequency of omphalitis. There aren't any studies that we are aware of that evaluate gentian violet's effectiveness in cleaning the umbilical cord.	Since gentian violet is widely available for use in India and other low-resource settings, more observational studies would be helpful to gain a better understanding of its use for cord care.

12	Facility Delivery, Postnatal Care and Neonatal Deaths in India: Nationally-Representative Case-Control Studies	Shaza A Fadel, Usha Ram, Shaun K Morris, Rehana Begum, Anita Shet, Raju Jotkar, Prabhat Jha	PLOS one	10.1371/journal.pone.0140448	2015	Case-Control Study	The study population in the paper consists of ever-married women aged 15-49 years surveyed in 601 districts in India	The sample size in the study was 211,020 live births (among whom 2,530 neonatal deaths occurred) for the 2004-8 period and 92,453 live births(among whom 1,573 neonatal deaths occurred) for the 2001-4 period.	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4610669/	Odds of neonatal death in relation to facility delivery and postnatal checkup	The paper discusses the association between facility delivery, postnatal checkups, and neonatal mortality in India, highlighting the importance of postnatal checkups in reducing neonatal deaths when combined with facility delivery. About a third of all neonatal deaths in India could be avoided by facility delivery combined with postnatal checkup.	The methodology involved a case-control study design using data from the District Level Household Survey-3 (DLHS-3)& DLHS-2 with a focus on examining the impact of place of delivery and postnatal checkup on neonatal mortality. Deaths occurring between 1-28 days among most recent live births were classified as cases. Two sets of controls are used in the primary analyses: (i) all live births that were still alive on day 28 (referred to as "all controls"); and (ii) a subset of live births in which the mothers reported seeking medical attention for either obstructed labor or excessive bleeding during pregnancy.	Facility delivery without postnatal checkup was associated with increased odds of neonatal death, especially for early neonatal deaths. - Facility delivery with postnatal checkup was associated with reduced odds of neonatal death.		The policy recommendation based on the study is to prioritize and promote facility delivery combined with postnatal checkups to reduce neonatal deaths in India, with a particular emphasis on improving postnatal care in poorer states.
13	Care Around Birth Approach: A Training, Mentoring, and Quality Improvement Model to Optimize Intrapartum and Immediate Postpartum Quality of Care in India	Gunjan Taneja, Enisha Sarin, Devina Bajpayee, Saumyadripta Chaudhuri, Geeta Verma, Rakesh Parashar, Nidhi Chaudhry, Jaya Swarup Mohanty, Nitin Bisht, Anil Gupta, Shailendra Singh Tomar, Rachana Patel, V S Sridhar, Anurag Joshi, Chitra Rathi, Dinesh Baswal, Sachin Gupta, Rajeev Gera	Global Health: Science and Practice	10.9745/GHSP-D-20-00368	2016-201	Observational study	The study population includes 1,410 staff nurses and auxiliary nurse-midwives (ANMs) posted at the intervention facilities.	427 of these staff assessed, as well as 195 staff nurses/ANMs, 77 medical officers, and 41 district and state officials interviewed, 399 deliveries observed, and 392 beneficiaries interviewed.	https://www.ghspjournal.org/content/9/3/590.long	Change or improvement in care practices during the intrapartum and immediate postpartum periods, are evaluated through an external assessment.	The Care Around Birth approach combined training, mentoring, and quality improvement processes to improve the quality, equity, and dignity of care during childbirth and the immediate postpartum period, in order to address key drivers of maternal and newborn mortality and refocus efforts on facility-based quality of care.	The methodology included: - A baseline assessment across all intervention facilities, covering 748 data parameters on labor room environment, staff competencies, and practices - An external evaluation conducted by the Center for Operations Research and Training, which: - Sampled 51 intervention facilities (using WHO's Service Availability and Readiness Assessment technique) - Included facility assessment, competency assessment of staff, in-depth interviews, and direct observation of deliveries.	The Care Around Birth approach addressed major factors that contribute to maternal and newborn mortality by adopting an integrated implementation framework that combined mentoring, training, and quality improvement procedures to enhance the standard, equity, and dignity of care during the intrapartum and immediate postpartum periods. The strategy put more emphasis on facility-based quality procedures, which are now essential to efforts to lower mortality and meet targets for the Sustainable Development Goals.	The strategy focused on high caseload facilities. However, engaging Level 1 facilities with a simplified version of basic obstetric and newborn care might have improved overall care quality and optimized caseload distribution. Interventions for managing maternal and newborn complications, such as postpartum hemorrhage, pre-eclampsia/eclampsia, kangaroo mother care, assisted feeding of low birth weight babies, use of antenatal corticosteroids for preterm labor, management of maternal and newborn sepsis, and prevention of parent-to-child transmission, were implemented for less than a year, which was insufficient for proper evaluation and sustainability. Additionally, the approach did not enhance referral pathways or assess staff motivation.	Frameworks for integrated implementation must be customized to the environment in which health programs are implemented and matched to the resources present. Any improvement activity revolves around maximizing the involvement of health staff, which maintains facility-level ownership and accountability. However, the state and district health systems must provide sufficient support for this.

Evidence Table Link: Apurva Ahuja Evidence Table.xlsx

c. Findings from literature

Conclusion: Intrapartum and Postnatal Care Among Mothers of Infants Aged 0-2 Months

The comprehensive review of twelve articles provides an in-depth understanding of the current state, challenges, and advancements in intrapartum and postnatal care among mothers of infants aged 0-2 months. These findings emphasize the importance of quality improvement initiatives, socioeconomic considerations, education, and systematic approaches in enhancing maternal and neonatal health outcomes.

1. **Quality Assurance and Improvement Initiatives**: District Quality Assurance Committees and QI teams have been instrumental in improving healthcare infrastructure and staff distribution. These initiatives have significantly enhanced maternal and newborn care practices, leading to a higher rate of deliveries in public facilities compared to private ones.
2. **Training Programs**: Programs like the AMANAT nurse-mentoring initiative have substantially improved intrapartum and newborn care through simulation and team training. This has led to notable increases in care scores, showcasing the importance of continuous professional development for healthcare workers.
3. **Socioeconomic Factors**: Socioeconomic determinants play a crucial role in the utilization of maternal health services. Despite an overall increase in the use of antenatal care, skilled birth attendance, and postnatal care, low utilization rates persist in certain socioeconomic groups. Addressing these determinants is essential for reducing maternal mortality.
4. **Maternal Education**: Postnatal education using tools like flipcharts has significantly improved essential newborn care (ENC) skills and knowledge retention. Enhanced breastfeeding techniques, hygiene practices, and danger sign recognition in newborns were observed, leading to reduced rates of early infancy illnesses.
5. **Neonatal Mortality**: The presence of all eight Care Around Delivery (CAD) indicators is associated with a 19% reduction in neonatal deaths. However, gaps in intrapartum care, especially in rural and urban primary health centres (PHCs and CHCs), highlight the need for better emergency obstetric services and skilled human resources.
6. **Quality Assessment Tools**: Tools like LaQshya, which cover a significant portion of WHO quality measures, demonstrate a higher capacity for quality assessment in maternal and newborn care compared

to other tools. This emphasizes the importance of robust quality assessment mechanisms in improving care standards.

7. **Respectful Maternity Care (RMC)**: Promoting RMC is critical for reducing global health inequities. Health workers face barriers in promoting RMC, with the COVID-19 pandemic further compromising care standards. Strengthening health systems to support RMC is necessary for improving maternal and neonatal health outcomes.
8. **Geographic Variations**: There is significant variation in the quality of maternal and newborn care within small areas of districts. Northern India, in particular, shows lower quality care with greater variation, indicating the need for targeted interventions. Aspirational districts, despite some improvements, still require focused policy attention to address quality care gaps.
9. **Cord Care Practices**: Despite recommendations for dry cord care, many still use antiseptics like gentian violet, which have been associated with reduced neonatal mortality. Further research is needed to confirm the efficacy of gentian violet in low-resource settings.
10. **Postnatal Checkups**: Facility deliveries without postnatal checkups are linked to higher odds of neonatal death, particularly early neonatal deaths. In contrast, facility deliveries with postnatal checkups are associated with reduced neonatal mortality, underscoring the importance of comprehensive postnatal care.
11. **Integrated Care Approaches**: The Care Around Birth approach, which integrates mentoring, training, and quality improvement, effectively addresses factors contributing to maternal and newborn mortality. Emphasizing facility-based quality procedures is essential to meeting Sustainable Development Goals (SDGs) related to maternal and newborn health.

Recommendations for Further Research

1. **Socioeconomic Determinants**: Investigate specific socioeconomic barriers to maternal health service utilization and develop targeted interventions to address these challenges.
2. **Long-term Impact of Training Programs**: Conduct longitudinal studies to assess the long-term effectiveness of nurse-mentoring and other training programs on maternal and newborn care practices.
3. **Effectiveness of Maternal Education Tools**: Explore the scalability and long-term impact of postnatal education tools like flipcharts on maternal and newborn health outcomes.
4. **Cord Care Practices**: Further research the use of antiseptics like gentian violet in cord care to establish evidence-based guidelines for low-resource settings.
5. **Geographic Targeting of Interventions**: Develop and evaluate targeted interventions for improving maternal and newborn care in regions with significant geographic variations in care quality.
6. **Respectful Maternity Care**: Investigate the barriers to promoting RMC in different settings and develop strategies to integrate RMC into routine care practices, particularly in the context of health emergencies like pandemics.
7. **Postnatal Care**: Study the impact of comprehensive postnatal checkups on neonatal mortality and identify best practices for integrating these checkups into routine maternal and newborn care.

8. **Integrated Care Frameworks**: Evaluate the effectiveness of integrated care approaches, such as the Care Around Birth strategy, in different healthcare settings and refine these frameworks to enhance their impact on reducing maternal and newborn mortality.

In summary, the findings highlight the multifaceted nature of improving intrapartum and postnatal care among mothers of infants aged 0-2 months. Quality improvement initiatives, addressing socioeconomic determinants, continuous education, comprehensive care indicators, and targeted interventions are pivotal in enhancing maternal and neonatal health outcomes. Collaborative efforts between policymakers, healthcare providers, and communities are essential to bridge existing gaps and promote equitable, high-quality care for all mothers and newborns.

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2. *Secondary data analysis*

Reproductive, Maternal, Newborn, Child, Adolescent Health and Nutrition

Under the National Health Mission (NHM), improving mother and child health and their survival rates is essential to achieving national health goals. Reducing maternal, neonatal, and child mortality is another goal of SDG Goal 3. In recent years, creative approaches have emerged as part of the national effort to provide diverse demographic groups with evidence-based interventions. In order to impact the critical interventions for lowering maternal and child morbidity and mortality, the Ministry of Health & Family Welfare launched Reproductive, Maternal, Newborn, Child, Adolescent Health and Nutrition (RMNCAH+N) in response to the Government of India's "Call to Action (CAT) Summit" in February 2013.

INTRODUCTION OF RMNCHN IN CONTEXT OF BIHAR

The Reproductive, Maternal, Newborn, Child, and Adolescent Health and Nutrition (RMNCHN) strategy is a vital framework specifically designed to address the extensive health needs of women, children, and adolescents. In Bihar, a state in India marked by profound health challenges, the implementation of RMNCHN strategies has been pivotal in striving to improve health outcomes across various demographic segments. This strategic approach is tailored to tackle the multifaceted health issues prevalent in Bihar, including high maternal and infant mortality rates, widespread malnutrition, and inadequate access to quality healthcare services.

Bihar, with a population exceeding 120 million, is one of India's most populous and economically disadvantaged states. Historically, Bihar has faced significant health challenges, with key indicators often lagging national averages. The state's health system has struggled with high maternal and infant mortality rates, chronic malnutrition, limited access to healthcare facilities, and severe shortages of trained healthcare professionals.

*To address these critical health challenges, the RMNCHN strategy in Bihar has been meticulously designed and implemented. The initiatives focus on improving maternal and child health services, enhancing nutritional status, and increasing access to reproductive health services.

Key Interventions and Initiatives:

- To address the critical health challenges, the RMNCHN strategy in Bihar has been meticulously designed and implemented. The strategy involves strengthening health infrastructure by prioritizing the construction and functionalization of sub-centres in high-focus districts, ensuring that at least 25% of sub-centres under each Primary Health Centre (PHC) operate as delivery points.
- To address staffing shortages, particularly in remote areas, Bihar employs specialists, doctors, staff nurses, and Auxiliary Nurse Midwives (ANMs) on a contractual basis under the National Rural Health Mission (NRHM). Maternal and child health initiatives include Nutritional Rehabilitation Centres (NRCs) for children with severe acute malnutrition and the Integrated Management of Childhood Illnesses (IMNCI) strategy to combat pneumonia, diarrhoea, and malaria.

- Family planning services are bolstered through fixed-day sterilization centres and safe abortion services at 24/7 PHCs. The strategy also includes incentives for healthcare workers in hard-to-reach areas and partnerships with private providers and NGOs to supplement public health services.
- Monitoring and evaluation are integral, with performance appraisals linked to progress indicators to ensure continuous improvement. Through these efforts, Bihar aims to reduce mortality rates and improve health outcomes for its vulnerable populations.
- **Maternal and Newborn Health**: Key interventions include promoting institutional deliveries, improving the quality of care in public health facilities, and strengthening referral systems. Programs like the Janani Shishu Suraksha Karyakram (JSSK) provide free maternal and child health services, encouraging safe childbirth practices. Ensuring skilled birth attendance and access to emergency obstetric care are prioritized to reduce maternal and neonatal mortality.
- **Nutrition Programs**: Initiatives such as the Bal Kuposhan Mukt Bihar campaign aim to tackle child malnutrition through community-based activities, promoting early initiation of breastfeeding, and appropriate complementary feeding practices. Iron and Folic Acid (IFA) supplementation programs target anaemia reduction among pregnant women and adolescents. The Integrated Child Development Services (ICDS) scheme provides supplementary nutrition, growth monitoring, and health education to improve the nutritional status of children and mothers.
- **Adolescent Health Programs:** Efforts to improve adolescent health include school-based interventions for nutrition education, menstrual hygiene management, and promoting delay in age at marriage. The Adolescent Reproductive and Sexual Health (ARSH) program focuses on providing adolescents with comprehensive reproductive health education and services, aiming to reduce early pregnancies and improve reproductive health outcomes.
- **Community-Based Interventions:** Engaging community health workers, such as Accredited Social Health Activists (ASHAs), in outreach and awareness programs has been crucial in extending healthcare services to rural and underserved populations.

* The NFHS 5 Bihar Fact Sheet offers the following statistics in relation to RNMCHN.

- **Reproductive Health:** The total fertility rate in Bihar has declined to 3.0 children per woman, down from 3.4 in the previous NFHS survey, yet it remains higher than the national average. Adolescent fertility, a crucial indicator of reproductive health, stands at 77 births per 1,000 women aged 15-19, reflecting early childbearing practices that pose health risks to young mothers and their children.
- **Maternal Health**: Maternal health services have shown improvement, yet gaps persist. For instance, 52.9% of mothers had an antenatal check-up in the first trimester, and 25.2% had at least four antenatal visits, indicating a positive trend from previous years but still requiring enhancement. Institutional births have increased to 76.2%, with 56.9% occurring in public health facilities, showing a significant improvement in maternal healthcare access.

- **Newborn Health:** Neonatal mortality in Bihar is at 34.5 per 1,000 live births, reflecting the need for better perinatal care. Efforts to reduce neonatal deaths include increasing the coverage of postnatal care, with 57.3% of mothers receiving postnatal care from health personnel within two days of delivery.
- **Child Health:** Child health indicators highlight severe nutritional challenges. The prevalence of stunting (height-for-age) among children under five is 42.9%, and 22.9% are wasted (weight-for-height), demonstrating critical undernutrition issues that impact long-term health and development. Vaccination coverage has improved, with 71.0% of children aged 12-23 months fully vaccinated, up from 61.7% in the previous survey.
- **Adolescent Health:** Adolescent health remains a key focus, given the high rates of early marriage and childbearing. About 40.8% of women aged 20-24 years were married before the age of 18, and 11.0% of women aged 15-19 years were already mothers or pregnant at the time of the survey. These factors contribute to ongoing cycles of poor health and nutrition among young women and their children.
- **Nutritional Status:** Nutrition indicators for children in Bihar point to severe issues. Among children under five, 69.4% are anemic, and 41.0% are underweight (weight-for-age).

  In conclusion, the RMNCHN strategy in Bihar represents a comprehensive and targeted approach to improving health outcomes for women, children, and adolescents. Through focused interventions, strategic partnerships, and community engagement, Bihar is making strides towards achieving better health and well-being for its population. Continued efforts and sustained focus on these areas are essential for overcoming the deep-rooted health disparities in the state and ensuring a healthier future for its residents.

a. Methodology

- **Study Area: 13 districts of Bihar selected randomly from 9 Commissionerate**
- **Target Population: Mothers of 0-5, 6-11, 12-23 months old children.**
- **Sample Size: of 2250 mothers per category (0-5 months, 6-11 months & 12-23 months)**
- **Data Type: Primary Data**
- **Study Design: Secondary Analysis**

i. Secondary Analysis Classes: Preparing the Indicator Matrix and Selection of Questions from Tool/Codebook

SELECTION OF QUESTIONS FROM TOOL/CODEBOOK IN DETAIL

1. **Initial Survey Participation**
   - The survey was already underway in the organization when we joined.
   - We were integrated into the ongoing data collection process.
   - Through this participation, we learned about the data collection methods, including the tools and techniques used for different age groups.

2. **Survey Design and Execution**
    - The survey was structured as a mini household survey, targeting 13 different districts of Bihar.
    - We were divided into small groups, each accompanied by program leaders and data collectors.
    - Our teams visited various districts to conduct the survey and the sample size obtained was of 2250 mothers/ beneficiaries.
    - During these field visits, we closely observed the data collection process and gained practical knowledge about the implementation of the questionnaire tool.
3. **Data Analysis and Codebook Preparation**
    - After data collection, the data analyst began the analysis phase.
    - The analyst created a detailed codebook, which included:
        - All variables
        - Questions
        - Values
        - Labels
    - The codebook was categorized into three distinct age groups: 0-5, 6-11, and 12-23 months.
    - The questions included in the codebook were in context to RMNCHN (Reproductive, Maternal, Newborn, and Child Health and Nutrition).
4. **Distribution and Review of the Codebook**
    - Once the codebook was prepared, it was shared with all team members.
    - We were tasked with reviewing the codebook to identify and select questions pertinent to socio-demographic aspects.
5. **Creation of Indicator Matrix**
    - 1st we created an Indicator matrix focused on questions related to the socio-demographic characteristics of respondents & then we created another matrix with additional health indicators.
    - **Sociodemographic Indicators**: We began by creating an indicator matrix for 13 sociodemographic indicators common across all three tools.
        - **Components of the Matrix**: This matrix included several key elements:
            1. **Question Number**: The specific number assigned to each question within the tool.
            2. **Question Label**: A brief description of what the question entails.
            3. **Variable**: The variable name used in the software.
            4. **Value**: The possible responses or data points for each question.
            5. **Label of the Value**: Descriptive labels for each response or data point.
    - **Maternal, Newborn, Nutrition, and Family Planning Indicators**: Following the sociodemographic indicators, we expanded our matrix to include 18 additional indicators encompassing maternal health, newborn care, nutrition, and family planning.

      (Both the Indicator matrices are presented in the next section)

    - The Excel sheet was organized to include:

        - Tool questions
        - Question labels
        - Respective variables
        - Corresponding values
    - For instance, for the variable "mother's age," we defined three categories:
        - Less than or equal to 24 years
        - 25-34 years
        - 35 years and older
    - These categories were coded as 0, 1, and 2, respectively. This coding facilitated straightforward data analysis in SAS software.
6. **Coding and Frequency Analysis in SAS Software**
    - We proceeded to code all the indicators within the SAS software environment.
    - Using our predefined coding system, we were able to efficiently obtain the frequency of each variable.
    - For example, the variable "mother's age" was coded such that:
        - Ages ≤ 24 were coded as 0
        - Ages 25-34 were coded as 1
        - Ages ≥ 35 were coded as 2
    - This approach enabled us to easily calculate and analyse the frequency distribution of each variable within our sample.
7. **Review and Refinement**
    - After the initial coding and frequency analysis, we matched with the already existing results for accuracy.
    - Any discrepancies or errors identified during this review were addressed and corrected.
    - This step ensured the reliability and validity of our data analysis process.

By meticulously following these steps, we ensured a comprehensive and methodical approach to the data collection, analysis, and interpretation process. This enabled us to derive accurate and meaningful insights from the survey data, ultimately contributing to a deeper understanding of the socio-demographic aspects of our respondents.

SELECTION OF KEY INDICATORS FROM THREE CODEBOOKS COVERING SIGNIFICANT RMNCHN TOPICS

The methodology for the study involved several key steps to ensure accurate data collection and analysis. Below is a detailed, step-by-step description of the process:

1. Selection of Important Questions and Indicators

Questions and indicators were selected from codebooks categorized as follows:

- **Newborn and Maternal Health**: Questions and indicators were sourced from the 0-5 codebook.
- **Newborn Nutrition**: Questions and indicators were sourced from the 6-11 codebook.
- **Family Planning**: Questions and indicators were sourced from the 12-23 codebook.

These questions and indicators were chosen based on their relevance and importance to the study objectives.

2. Coding of Indicators in SAS Software

- We imported all the three codebooks (0-5, 6-11, and 12-23) into SAS software.
- For each indicator, we defined the specific criteria for the numerator and denominator. For example, to calculate the percentage of recently delivered women currently using any contraceptive method, we:
  - Created values that indicated whether a woman was currently using any contraceptive method (coded as 0 for 'No' and 1 for 'Yes').

3. Frequency Analysis Using SAS

- After coding the indicators, we used the "proc surveyfreq" procedure in SAS to obtain the frequency tables for each indicator.
  - **proc surveyfreq**: This procedure was specifically used to calculate and display the frequency distribution of the variables according to the defined criteria.
  - The frequency table provided the count and percentage of respondents for each indicator category (e.g., women using contraceptives vs. those not using them).

4. Calculation of Indicator Frequencies

- For each indicator, the frequency was calculated as follows:
  - **Numerator**: The count of responses that met the criteria for the indicator (e.g., number of women using contraceptives).
  - **Denominator**: The total count of responses considered for the indicator (e.g., total number of recently delivered women).

5. Compilation of Results

- The frequency tables generated for each indicator were compiled and analysed to understand the distribution and prevalence of different variables which were in context of RNMCHN.

6. Documentation and Reporting

- The results were then compiled into a comprehensive report, highlighting key findings and trends observed in the data.

By following these systematic steps, we ensured a thorough and accurate analysis of newborn health, maternal health, and family planning indicators, providing valuable insights for further research and policymaking.

ii. Indicator definitions

1) **THR** - % of pregnant women received THR during last pregnancy.
2) **Institutional delivery** - % of recently delivered women who delivered their last child in a facility.
3) **STSC** - % of child aged 0-5 month received immediate Skin to skin care after birth
4) **Weighing at birth** - % of child aged 0-5 month weighted at birth
5) **TIBF** - % of child aged 0-5 month received Timely Initiation of Breast Feeding (TIBF) within 1 hrs.
6) **Exclusive breastfeeding** - % of child aged 0-5 month received exclusive breastfeeding (last 24 hours)
7) **Breastfeeding** - % of child aged 6–11-month currently receiving breast feeding
8) **Complementary feeding** - % of children aged 6–11 months who Initiated complementary feeding
9) **Any contraceptive method** - % of recently delivered women currently using any contraceptive method
10) **Modern contraceptive method** - % of recently delivered women currently using modern contraceptive method
11) **Traditional contraceptive method** - % of recently delivered women currently using traditional contraceptive method

c. Results/findings

i. Indicator Matrix

tool questions	question label	variable	value	label
202	gender of the baby	baby gender	1	male
			2	female
110	mothers age	mother_age	0	<=24
			1	25-34
			2	>=35
102	what is your religion	religion	0	hindu
			1	others
103	what is your caste	caste	0	marginalised
			1	non marginalised
105	economic status	wealth index	0	poorest
			1	middle
			2	upper
101	family type	family type	1	nuclear family
			2	joint family
112	What is the highest standard of formal education you completed?	mothers education	0	highest education
			1	don't know
115_SP	What is the highest standard of formal education you completed?	husbands education	0	illiterate
			1	upto 8th
			2	more than 8th

	tool questions	question label	variable	value	label
29					
30	116_1	what do you primarily do ?	Mothers occupation	0	unemployed
31				1	agricultural labourer
32				2	non agricultural labourer
33				3	business
34				4	salaried
35					
36	116	What is your husband's main occupation?	Husband occupation	0	unemployed
37				1	agricultural labourer
38				2	non agricultural labourer
39				3	business
40				4	salaried
41					
42	123	Husband migartion	Migrant	0	migrant
43				1	non migrant
44					
45	108_A 108_B	Any female in SHG	SHG member	0	no
46				1	yes
47					
48	119B, 112A, 122B	No of living children	living children	0	I child
49				1	2 children
50				2	3 children
51				3	more than 3 children
52					
53	301	where did you deliver your baby	place of delivery	0	public
54				1	private
55				2	home transit
56					

	A	B	C	D	E	F
1	Sl	Theme	DATA	Indicator Definition	Question of data collection tool	Variable name
2	1	Maternal	0-5	% of pregnant women received MCP cards	204. Do you have an MCP card for (NAME)?	MCP card
3	1	Maternal	0-5	% of pregnant women received any antenatal checkup during your last pregnancy	208X. Did you receive antenatal checkup during your last pregnancy?	received any ANC
4	1	Maternal	0-5	% of pregnant women received 3 or more antenatal checkup during your last pregnancy	209. How many times did you receive antenatal checkup during your last pregnancy?	3 or more ANC
5	1	Maternal	0-5	% of pergnant women received 4 or more antenatal checkup during your last pregnancy	209. How many times did you receive antenatal checkup during your last pregnancy?	4 or more ANC
6	1	Maternal	0-5	% of pregnant women received IFA tablet during your last pregnancy	213. When you were pregnant did you receive tablets of Iron (IFA)?	received IFA
7	1	Maternal	0-5	% of pregnant women received 90 or more IFA tablet during your last pregnancy	214. How many of these tablets did you receive in total?	received IFA
8	1	Maternal	0-5	% of pregnant women consumed 90 or more IFA tablet during your last pregnancy	217. Of all the tablets / Capsule given to you, how many tablets/ Capsules did you consume in total during your pregnancy?	consumed IFA
9	1	Maternal	0-5	% of pregnant women received THR during your last pregnancy	223. When you were pregnantmdid you ever receive any food (take home ration) from the AWC for yourself, specifically for your pregnancy?	received THR
10	2	Newborn	0-5	% of institutional delivery	233. When you were pregnant, where did you plan to deliver	Institutional delivery
11	2	Newborn	0-5	% of child aged 0-5 month received immediate Skin to skin care after birth	348. Did you practice keeping the child naked on your bare chest, next to your skin immediately after delivery?	STSC
12	2	Newborn	0-5	% of child aged 0-5 month weighted at birth	359. Was the baby weigh right after birth ?	Weight at birth
13	2	Newborn	0-5	% of child aged 0-5 month received Timely Initiation of Breast Feeding (TIBF) within 1 hrs.	330. How long after the birth did you or some other lactating woman first breastfeed (NAME)?	TIBF
14	3	Nutrition	0-5	% of child aged 0-5 month received exclusive breastfeeding (last 24 hours)	417. Have you ever given any of these things other than breastmilk at any time	Exclusive breastfeeding

ii. Findings based on descriptive analysis conducted during the SAS sessions

variable	value	label	N	n	%	LCL	UCL	Freq Missing
Gender	0	boys	2250	1194	53.07	51.00	55.13	
	1	girls		1056	46.93	44.87	49.00	
mother age	0	<=24	2250	1426	63.38	61.39	65.37	
	1	25-34		770	34.22	32.26	36.18	
	2	>=35		54	2.40	1.77	3.03	
religion	0	Hindu	2250	1930	85.78	84.33	87.22	
	1	Others		320	14.22	12.78	15.67	
caste	0	Marginalized	2250	685	30.44	28.54	32.35	
	1	Non-marginalized		1565	69.56	67.65	71.46	

family type	0	nuclear	2250	883	39.24	37.23	41.26	
	1	joint		1367	60.76	58.74	62.77	
MED U	0	Illiterate	2250	782	34.76	32.79	36.72	
	1	up to 8th		510	22.67	20.94	24.40	
	2	More than 8th		958	42.58	40.53	44.62	
FEDU	0	illiterate	2089	704	33.70	31.67	35.73	
	1	up to 8th		487	23.31	21.50	25.13	**161**
	2	more than 8th		898	42.99	40.86	45.11	
MOC U	0	Unemployed	2250	2140	95.11	94.22	96.00	
	1	Agricultural		23	1.02	0.61	1.44	
	2	Non- agricultural		38	1.69	1.16	2.22	
	3	Business		22	0.98	0.57	1.38	
	4	salaried		27	1.20	0.75	1.65	
Husband Occupation	0	Unemployed	2230	79	3.54	2.77	4.31	
	1	Agricultural		189	8.48	7.32	9.63	
	2	Non- agricultural		1063	47.67	45.59	49.74	**20**
	3	business		308	13.81	12.38	15.24	
	4	salaried		591	26.50	24.67	28.34	
Husband Migration	0	non-Migrant	2250	1966	87.38	86.00	88.75	
	1	migrant		284	12.62	11.25	14.00	
SHG membership	1	yes	2250	124	5.51	4.57	6.45	
	0	no		2126	94.49	93.55	95.43	
living child	1	1 child	2250	724	32.18	30.25	34.11	
	2	2 children		647	28.76	26.88	30.63	
	3	3 children		461	20.49	18.82	22.16	
	4	more than 3 children		418	18.58	16.97	20.19	
Place delivery	0	public	2250	1457	64.76	62.78	66.73	
	1	private		484	21.51	19.81	23.21	
	2	home/transit		309	13.73	12.31	15.16	
House type	1	kuccha	2250	398	17.69	16.11	19.27	
	2	semi-pukka		1270	56.44	54.39	58.49	
	3	pukka		582	25.87	24.06	27.68	

variable name	value	label	N	n	%	LCL	UCL	FREQ MISSING	SAS CODE

Receipt of mcp_card	1	yes	2250	1851	82.2667	80.6873	83.8461		data HHS.data;
									set HHS.data;
									/*% of pregnant women received MCP cards*/
									if q204=1 then mcp_card=1;
									else mcp_card=0;
									run;

	0	no		399	17.7333	16.1539	19.3127		

Any Antenatal checkup clinic visited	1	yes	2250	2221	98.7111	99.2447	99.1775		data HHS.data;
									set HHS.data;
									/*% of pregnant women received any antenatal checkup during your last pregnancy*/
									if q208x=1 then anyanc=1;
									else anyanc=0;
									run;

	0	no		29	1.2889	0.8225	1.7553		
Antenatal checkup 3 or more times	1	3 or more times	2221	1519	68.3926	66.4575	70.3277		data HHS.data; set HHS.data; /*% of pregnant women received 3 or more antenatal checkup during your last pregnancy*/ if q209>=3 then anc3=1; else if q208x=1 and

									q209<3 then anc3=0; run;
	0	less than 3 times	2221	n	31.6074	29.6723	33.5425	29	

Antenatal checkup 4 or more times	1	4 or more times	2221	893.6	43.4039	41.341	45.4667		data HHS.data;
									set HHS.data;
									/*% of pregnant women received 4 or more antenatal checkup during your last pregnancy*/
									if q209>=4 then anc4=1;
									else if q208x=1 and q209<4 then anc4=0;
									run;

	0	less than 4 times	2221	790.2	56.5961	54.5333	58.659	29	
Iron folic acid tb received in last pregnancy	1	yes	22506	6868	90.4444	89.2288	91.6601		data HHS.data; set HHS.data; /*% of pregnant women received IFA tablet during your last pregnancy*/ if q213=1 or q214b=1 then IFA_rec=1;

									else IFA_rec=0; run;
	0	no	2250	583.4	9.5556	8.3399	10.7712		

Received 90 or more IFA	1	90 or more tablets	22221	480	26.6096	24.7704	28.4489		data HHS.data;
									set HHS.data;
									/*% of pregnant women received 90 or more IFA tablet during your last pregnancy*/
									IFA90=sum(q214a,q214c_a);
									if q214=999 and q214c=999 then IFA90rec=.;
									else if IFA90>=90 then IFA90rec=1;
									else IFA90rec=0;
									run;

	0	less than 90 tablets	22221	**n**	73.3904	71.5511	75.2296	**29**	

90 or more IFA consumed	1	consume 90 or more	2015	376	16.8238	15.1891	18.4585	**235**	data HHS.data;
									set HHS.data;
									/*number of IFA tablets consumed*/
									if q217=99 then number_IFAcon=.;*don't know;
									else if q217a>=90 then number_IFAcon=1;*more than 90 tablets;
									else number_IFAcon=0;
									run;

	0	do not consume 90 or more	2015	273.2	83.1762	81.5415	84.8109		

Received Take home ration in last pregnancy	1	YES	22550	169.8	40.3556	38.3268	42.3843		data HHS.data;
									set HHS.data;
									/*% of pregnant women received THR during your last pregnancy*/
									if q223=1 then thr_rec=1; *received;
									else thr_rec=0; *not received;
									run;

	0	NO	22550	66.4	59.6444	57.6157	61.6732		

Instituitional_delivery during last pregnancy	1	institutional delivery	2250	-37	86.2667	84.8434	87.69		data HHS.data;
									set HHS.data;
									/*place of delivery*/
									if Q301 in (1,2,3,4,5,6,7,8) then instititutional_delivery =1;*Institutional;
									else instititutional_delivery =0;*home;
									run;

	0	home delivery	2250	**n**	13.7333	12.31	15.1566		

Received STSC(Skin to skin care) after birth	1	yes	1979	-140.4	65.437	63.34	67.5342		data HHS.data;
									set HHS.data;
									/*% of child aged 0-5 month received immediate Skin to skin care after birth*/
									if Q318=99 or Q346=99 then STSC=.;
									else if Q318=. and Q346=. then STSC=.;
									else if Q318=2 or Q346=1 then STSC=1;
									else STSC=0;
									run;

	0	no	1979	-243.8	34.563	32.466	36.66	**271**	

Baby Weight measured	1	yes	217	-347.2	82.9572	81.3742	84.5401	**79**	data HHS.data;
									set HHS.data;
									/*% of child aged 0-5 month weighted at birth*/
									if q334=1 or Q359=1 then BABY_Weight=1;
									if q334=2 or q359=2 then BABY_Weight=0;
									run;

	0	no	217	-450.6	17.0428	15.4599	18.6258		

Received tibf(Timely initiation of breast feeding)	1	within 1 hour	225	-554	66.2667	64.3116	68.2217		data HHS.data;
									set HHS.data;
									/*% of child aged 0-5 month received Timely Initiation of Breast Feeding (TIBF) within 1 hrs.*/
									tibf=sum (q330h,(q330day*24), q356h,(q356day*24));
									if tibf<=1 then tibf_cat=1;
									else tibf_cat=0;
									run;

	0	after 1 hour	225	**n**	33.7333	31.7783	35.6884		

Received EBF(Exclusive Breastfeeding)	1	received EBF	2250	-657.4	50.4889	48.4214	52.5563		data HHS.data;
									set HHS.data;
									/*% of child aged 0-5 month received exclusive breastfeeding (last 24 hours)*/
									if Q415a=2 and Q415b=2 and Q415c=2 and Q415d=2 and Q415e=2 and Q415f=2 and Q415g=2 and Q415h=2 and Q415i=2 and Q415j=2 then EBF=1;
									else EBF=0;
									run;

	0	not received EBF	2250	-760.8	49.5111	47.4437	51.5786		

Currently receiving breastfeeding	1	yes	2250	-864.2	93.5111	92.4925	94.5297		data HHS.data;
									set HHS.data;
									/*% of child aged 6-11 month Currentely receving breast feeding*/
									if Q205=1 then breastfeeding=1;
									else breastfeeding=0;
									run;

	0	no	2250	-967.6	6.4889	5.4703	7.5075		

complimentary feeding initiated	1	yes	225
			50
				-
				1071
					65.4222	63.4555	67.389		data HHS.data;
									set HHS.data;
									/*% of children aged 6–11 months who Initiated complementary feeding*/
									if Q209=1 then complimentaryfeeding=1;*yes;
									else complimentaryfeeding=0;*no;
									run;
									proc surveyfreq data=HHS.data;
									tables complimentaryfeeding/cl alpha=0.05nostd;
									run;
									data HHS.data;
									set HHS.data;
									if Cal_childMR<9 then agegroup=1;
									else agegroup=2;
									run;
									proc surveyfreq data=HHS.data;
									tables agegroup/cl alpha=0.05nostd; ;
									run;

	0	no	225 50	778	34.5778	32.611	36.5445		

contraceptive_method being used	1	yes	1977	452	22.8629	21.0102	24.7157	**273**	data HHS.data;
									set HHS.data;
									/*% of recently delivered women currently using any contraceptive method*/
									if Q401=1 then contraceptive_method=1;*yes;
									else if Q401=2 then contraceptive_method=0;*no;
									else contraceptive_method=.;*Currently Pregnant;
									run;

	0	no	1977	1525	77.1371	75.2843	78.9898		
use_of_modern contraceptive	1	yes	1977	438	22.1548	20.3226	23.987		data HHS.data; set HHS.data; /*% of recently delivered women currently using modern contraceptive method*/ if Q402A=1 OR Q402B=1 OR Q402C=1 OR Q402D=1 OR Q402E=1 OR Q402F=1 OR Q402G=1 or Q402E1=1 or Q402I=1 OR

									Q402J=1 OR Q402J_1=1 OR Q402K=1 then use_of_modern=1; *yes; else if Q401 in (1,2) THEN use_of_modern=0; *no; run;
	0	no	1977	1539	77.8452	76.013	79.6774	**273**	
use_of_traditional contraceptive	1	yes	1977	15	0.7587	0.3759	1.1416		data HHS.data; set HHS.data; /*% of recently delivered women currently using traditional contraceptive method*/ if Q402L=1 or Q402M=1 or Q402N=1 then use_of_tm=1; *yes; else if Q401 in (1,2)then use_of_tm=0; *no; run;
	0	no	1977	1962	99.2413	99.8584	99.6241	**273**	

We did descriptive analysis in the sas software. Descriptive analysis is a fundamental step in the exploration and understanding of data. It involves summarizing and organizing data so that patterns and key characteristics can be clearly seen.

This helps to condense large amounts of data into simple summaries. This can be in the form of tables, charts, or statistical measures (like mean, median, and mode) that give a quick overview of the dataset. It provides initial insights and trends that can guide further, more detailed analysis. For example, if a high percentage of mothers are found to be illiterate, further investigation can be directed towards the impact of maternal education on child health outcomes. Descriptive statistics highlight areas where health behaviours are strong and where they need improvement. Descriptive data on key health indicators provide evidence for developing policies and programs. For example, if the data show that a significant number of children are not exclusively breastfed, programs can be designed to promote and support breastfeeding.

Explanation of the Contents of the Frequency Table

The frequency table provided in the document contains detailed statistical summaries of various demographic and health-related indicators from the survey data. Here are the components and what they represent:

1. **Variable Name:** This is the specific characteristic or attribute being measured, such as gender, mother's age, religion, etc.

2. **Categories:** Each variable can have multiple categories, which represent different possible values or groups within that variable. For example, the "Mother's Age" variable has categories like "≤24 years", "25-34 years", and "≥35 years".

3. **N:** This is the total number of respondents or observations included in the analysis for that variable. This number can differ slightly between variables due to missing data.

4.**n:** This is the number of respondents in each category of the variable. It tells us how many individuals fall into each specific group.

5. **% :** This represents the percentage of respondents in each category. It is calculated as (n/N) * 100, providing a proportionate representation of the data.

6. **LCL (Lower Confidence Limit):** This is the lower boundary of the confidence interval for the percentage. It provides an estimate of the lower range in which the true percentage is expected to fall, with a certain level of confidence (typically 95%).

7. **UCL (Upper Confidence Limit):** This is the upper boundary of the confidence interval for the percentage. It gives an estimate of the upper range in which the true percentage is expected to fall, with the same confidence level.

8. **Freq Missing:** This indicates the number of respondents with missing data for that particular variable. This is important for understanding the completeness and reliability of the data.

Purpose of Each Component

- Variable Name and Categories: These identify what is being measured and the different groups within each measure, allowing for a detailed understanding of the dataset's composition.
- **N and n:** These provide the raw counts of respondents, crucial for understanding the sample size and the distribution of responses across different categories.
- **%:** This offers a proportionate view of the data, making it easier to compare between different categories and understand their relative importance.
- **LCL and UCL:** These give a range within which the true value of the percentage is likely to fall, providing a measure of precision and reliability for the estimates.- **Freq Missing:** This highlights any gaps in the data, indicating areas where data collection might need improvement or where additional caution is needed in interpreting results.

Importance of the Frequency Table:

The frequency table is essential in descriptive analysis because it:

- Summarizes Data: It condenses large volumes of data into an easily understandable format.
- Identifies Patterns: Helps in spotting trends and patterns within the dataset.
- Guides Decision-Making: Informs policymakers and stakeholders about the current state of various indicators.
- Supports Further Analysis: Provides a foundation for more complex analyses, such as inferential statistics or predictive modelling.

d. Conclusion:

Our summer internship provided a thorough secondary analysis experience using SAS software to examine maternal, newborn, family planning, nutrition, and socio-demographic indicators. This process equipped us with valuable skills in data coding, analysis, and interpretation, emphasizing the significance of secondary data in public health research.

Key insights from our analysis include:

Maternal and Child Health: We observed improvements in institutional deliveries and antenatal care coverage, reflecting positive trends in maternal health services.
Family Planning: Data revealed varying usage rates of contraceptive methods, highlighting areas for targeted family planning interventions.
Nutrition: Despite improvements, child malnutrition remains a significant challenge, indicating the need for focused nutritional programs.
Adolescent Health: Insights pointed to ongoing issues in adolescent health, necessitating dedicated health initiatives for this demographic.

The process demonstrated the efficiency of secondary data analysis in identifying health trends and disparities, facilitating evidence-based policymaking and resource allocation. This experience not only enhanced our analytical skills but also underscored the critical role of data in advancing public health objectives.

Apurva Ahuja ST report

ORIGINALITY REPORT

15%	13%	10%	6%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS