STRATEGIC INTERVENTIONS FOR IMPROVING NEWBORN VACCINE RETENTION: INSIGHTS FROM A MATERNITY AND PAEDIATRIC HOSPITAL

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by

Parthvee Singh

Under the Supervision and Guidance of

Dr. Susmit Jain

2025

cloudnine

NABH

CERTIFICATE

This is to certify that **Parthvee Singh** in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the **IIHMR University, Jaipur** has successfully completed her dissertation at **Cloudnine Hospital, Bangalore** during Mar 10 - May 31, 2025.

Place: Bangalore

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CERTIFICATE

This is to certify that dissertation titled **STRATEGIC INTERVENTIONS FOR IMPROVING NEWBORN VACCINE RETENTION: INSIGHTS FROM A MATERNITY AND PAEDIATRIC HOSPITAL** is a record of the research work undertaken by **PARTHVEE SINGH** in partial fulfilment of the requirements for the award of the degree of MBA Hospital & Health Management from the IIHMR University, Jaipur under my guidance and supervision and her approach to the research study has been sincere, scientific, and analytical.

Faculty guide: Dr. Susmit Jain
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Date : 18-06-2025

School Dean: Dr. Sanjay Gupta
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Date: 18-06-2025

DECLARATION BY STUDENT

I hereby declare that this dissertation titled **STRATEGIC INTERVENTIONS FOR IMPROVING NEWBORN VACCINE RETENTION: INSIGHTS FROM A MATERNITY AND PAEDIATRIC HOSPITAL** is the Bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

(Signature)

PARTHVEE SINGH

Date 18/6/25

ABSTRACT

Submitted By: Parthvee Singh Guided by: Dr. Susmit jain

Enroll. No: 1777

Title of study: Strategic Interventions for Improving New-born Vaccine Retention: Insights from a Maternity and Paediatric Hospital

Key Words: Neonatal, Vaccine retention, Public health, cloud nine hospital

Timely immunization during the early months of life is critical to prevent life threatening infectious diseases. While in India the Universal Immunization Programme (UIP) includes a comprehensive range of vaccines, the retention of and subsequent adherence to the vaccine schedule (particularly in private hospitals), is poor. The focus of this research is on Cloud Nine Hospital in Bangalore, an operational establishment for maternity and paediatrics, with the study area evaluating trends in immunization retention and barriers to vaccination adherence for neonates' post-discharge.

The study used a mixed-methods research design drawing from quantitative information from the (HMIS) and pharmacy sales and qualitative data via structured questionnaires (with mothers) and telephone follow-up calls. Approximately 2,500 births were tracked from April 1, 2024 to March 31, 2025, with a focused sample of 210 mothers and 30–40 healthcare providers.

The results showed that the retention rates for vaccines at 6, 10, and 14 weeks and 6 months, on average, was only 30–40%. There were several reasons given for dropping off the vaccine schedule including, cost of vaccines, moving to their native place, lack of time (for those served by in home health care), lack of reminders, and insufficient information to help parents understand the importance of vaccinations and the vaccination schedule. How the healthcare staff communicated relevant information to the mothers when discharging babies was inconsistent and that not all staff were coordinated properly.

The recommendations for resolving these issues in the study consist of structured discharge counselling, SMS/WhatsApp reminders, flexible vaccine packages, improved appointment confirmation systems, and more substantial staff training..

The research set out to ascertain the ways to improve neonatal immunization adherence. The study explains its findings and concludes that improving neonatal immunization.

ACKNOWLEDGEMENT

I want to take a moment to thank my support, and the people who helped me throughout the course of this dissertation. This research has been a valuable learning experience and for that I owe thanks to a number of individuals and organizations, whose support and guidance were instrumental in making this study possible.

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Date Parthvee Singh

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ABBREVIATIONS

S.NO	ABBREVIATIONS	DESCRIPTION
01	HMIS	HOSPITAL MANAGEMENT INFORMATION SYSTEM
02	DOB	DATE OF BIRTH

CHAPTER:1

INTRODUCTION

CHAPTER 1: INTRODUCTION

1.1 Background

The most impactful and evidence-based still remains the new-born immunization owing to public health interventions around the world. The infant's life is precious and needs utmost care and protection and therefore vaccines protect them from various infectious diseases during their early stages in life.

Vaccine services are ready and provided within reach in the country for all citizens with the Universal Vaccine Immunization Programme (UIP), however, the uses of the vaccine, especially in hospitals, have alarming dropout rates. Robust and strong immunity for infants can be achieved by completing the primary immunization schedule in a timely manner, which consists of the following doses at birth, 6 weeks, 10 weeks, 14 weeks, and a booster at 6 months.

Along with UNICEF, the WHO widely put focus on providing initial vaccines and also emphasize covering all important vaccines in the global retaken the initial limit with time. The retention of the vaccines problem that is often not as looked at as it should be which is usually the case in private healthcare facilitated to people without the specific outlined systems for holistic care including after care post outside public health systems. The institutional delivery for private hospitals is on the rise in Indian urban areas leading to the new dynamics of postnatal care and even immunization that comes with.

This problem involving the retention of vaccine services as a clinical challenge is, in careful review, almost never tackled in a private health care facility which lacks outreach and follow up resources in comparison to a public health system. The growth of institutional deliveries at private hospitals has also brought about changes in the postnatal care dynamics, like the case with immunization practices, in urban India.

The scope of this study is situated within Cloud Nine Hospital, a leading paediatric and maternity care hospital located in Bangalore, India. Gaps in retention concerning the utilization of immunization services, primarily after the hospital-to-home care transition, have been noted even with the provision of these services. The primary purpose of this research is to identify and understand these patterns and devise feasible, low-cost, and easily expandable policies targeted for such environments.

The opportunity to work closely with the mother and new-born within the first few days of life is unprecedented in a hospital setting. This is an important time to mobilize families and clinicians to ensure that families understand the requisite processes involved and the entire immunization schedule participation is maximized.

Unfortunately, in many such hospitals the systems currently used are limited to verbal counselling or written discharge instructions which in many circumstances does not take into consideration the varying health literacy skills and logistical constraints amongst families.

Additionally, the support networks that assisted with childbearing activities within families, such as the providing of vaccination reminders, are widely missing as a result of migration to urban areas and nuclear family systems.

1.2 Problem Statement

This research seeks to demonstrate that structured parental counselling combined with strategic interventions like sophisticated digital reminder systems, proactive discharge planning, and fortified discharge planning can significantly improve the retention of new-born vaccines. Unlike many studies which tend to focus on outreach based immunization or solely on national level statistics, this research seeks to improve the internal processes of a specific hospital with the intention of achieving improved results.

The goal is not just to identify the rate of vaccine dropouts but to deliver deeper into the what are the lived experiences of mothers and healthcare staff that care vaccine adherence? Are there barriers within the hospital workflow that miss follow up opportunities? How do parents regard the importance of the vaccine, and what mechanisms of communication appeal to them?

Answering these questions will enable us to build an actionable plan which is deeply rooted in actual realities instead of hypothetical ideals.

This builds a base for an inquiry steeped in practical endeavours towards one of the most significant problems in child healthcare. Now that the child's survival alongside his holistic growth and development are reliant on timely vaccinations, this thesis intends to mobilize effort and intellect.

1.3 Research Aim and Objectives:

1.3.1 Aim

To assess and increase immunization adherence among neonates in a private hospital environment at Cloud Nine Hospital in Bangalore by identifying obstacles, comprehending stakeholder viewpoints, and creating evidence-based, context-specific treatments.

1.3.2 Objectives

- To evaluate the present vaccination retention rate and trend among infants released from Cloud Nine Hospital, with an emphasis on main immunization schedule completion.
- To determine the main causes of vaccine dropout, such as institutional, systemic, and parental hurdles.
- To investigate how parents and medical professionals view and experience infant vaccination and follow-up procedures.
- To assess how well the hospital's current vaccine communication tactics such as written instructions and discharge counselling are working.
- To suggest and evaluate workable solutions to increase vaccination retention rates, such as digital reminder systems, structured counselling, and better discharge planning.
- To create a workable, reasonably priced, and expandable strategic framework for enhancing vaccination adherence in comparable private healthcare environments.

1.4 Research Questions

1.4.1 Primary research questions

What are the main determinants of vaccine retention among infants who are released from Bangalore's Cloud Nine Hospital?

1.4.2 Secondary research questions

- How many new-borns in this hospital setting are currently missing vaccines or taking longer than expected to finish their primary immunization schedule?

- What obstacles do parents encounter in keeping to the vaccination schedule, and how important do they think timely immunizations are?
- What are the weaknesses in the hospital's current discharge procedures and immunization communication strategies?
- What kinds of interventions such as structured counselling, digital reminders, and better discharge planning are most practical and acceptable for staff and parents to enhance vaccination?

CHAPTER:2

REVIEW OF LITERATURE

CHAPTER-2-REVIEW OF LITERATURE

1. UNICEF (2023)

UNICEF emphasized the importance of the first six months of life for immunization, highlighting the need for timely interventions and parental awareness. The global report also documented innovative strategies, including SMS reminders and community outreach, which were proposed in this study's strategic framework.

Source: UNICEF. (2023). Immunization: Giving every child a fair chance. https://www.unicef.org/immunization

2.WHO (2022)

The WHO report on global immunization trends outlined common causes for incomplete vaccine schedules, including urban migration, poor recordkeeping, and inconsistent health messaging. This complements the current study's identification of dropouts due to postnatal migration and unclear communication.

Source: World Health Organization (WHO). (2022). Immunization coverage: Key facts. https://www.who.int/news-room/fact-sheets/detail/immunization-coverage

3. Yadav et al. (2021)

Yadav et al. explored urban health system challenges in delivering timely vaccinations. The research emphasized the need for improved parent-provider communication and follow-up systems in private healthcare settings, which supports the current study's findings on systemic barriers and communication gaps.

Source: Yadav, K., & Singh, B. (2021). Barriers and facilitators of immunization in urban India: A health systems perspective. BMC Public Health, 21, 954. https://doi.org/10.1186/s12889-021-10996-7

4.Bhatia et al. (2020)

Bhatia et al. focused on strengthening India's Universal Immunization Programme (UIP) and emphasized the importance of integrating the private sector. They argued that although private hospitals handle a growing number of deliveries, their involvement in immunization remains weak, due to lack of regulation and system-based tracking.

Source: Bhatia, V., & Sethi, R. (2020). Strengthening the Universal Immunization Programme in India: Lessons from the private health sector. Indian Journal of Community Medicine, 45(Suppl 1), S7–S12. https://doi.org/10.4103/ijcm.IJCM_123_20

5.Bassey et al. (2015)

In a study from Nigeria, Bassey et al. investigated immunization dropout rates and found that lack of maternal knowledge and poor follow-up mechanisms were major contributors. Though conducted in a different region, the findings are highly transferable to the urban private hospital context in India.

Source: Bassey, G., & Dairo, M. D. (2015). Immunization dropout rate and the associated factors among children aged 12–23 months in a rural community in Southern Nigeria. African Journal of Primary Health Care & Family Medicine, 7(1), 1–6. https://doi.org/10.4102/phcfm.v7i1.782

6.Siddiqui et al. (2013)

Siddiqui et al. examined the epidemiology of vaccine hesitancy in India, focusing on both routine immunization and polio eradication campaigns. The study highlighted how misinformation, cultural beliefs, and logistical issues contribute to vaccine hesitancy, especially in urban areas. This aligns with the findings of the current study regarding misconceptions and low motivation among urban parents.

Source: Siddiqui, M., Salmon, D. A., & Omer, S. B. (2013). Epidemiology of vaccine hesitancy in India: Insights from polio eradication and routine immunization. Human Vaccines & Immunotherapeutics, 9(12), 2673–2679. https://doi.org/10.4161/hv.27243

CHAPTER:3

METHODOLOGY

CHAPTER 3: METHODOLOGY

3.1 PURPOSE

- Ensure complete and timely immunization of new-borns, which is critical for preventing life-threatening infectious diseases during early childhood.
- Understand the underlying reasons for vaccine dropouts in a hospital-based setting, particularly within private healthcare institutions like Cloud Nine Hospital, where structured follow-up systems may be lacking.
- Bridge the gap between hospital care and home-based follow-up, recognizing that the transition from institutional delivery to home care is a critical period when immunization adherence often declines.
- Identify systemic, behavioural, and informational barriers that prevent parents from completing the full immunization schedule for their new-borns.
- Evaluate the effectiveness of current counselling and discharge practices in educating parents about immunization schedules and their importance.

3.2 RESEARCH DESIGN

Both quantitative and qualitative methods were used in this investigation. While the qualitative component investigated the causes of missed or delayed vaccinations from the viewpoints of parents and healthcare professionals, the quantitative component evaluated the frequency and pattern of vaccine retention at standard immunization intervals (6, 10, and 14 weeks, and 6 months). This combination offered detailed, contextualized explanations for observed actions in addition to statistical trends.

3.3 STUDY POPULATION

- The average delivery rate and new-born data from the (HMIS) for the time frame of April 1, 2024, to March 30, 2025, served as the basis for this investigation. Over the course of this year, the hospital has seen about 2500 live births, according to HMIS figures. This offers a solid and sizable dataset for examining healthcare staff immunization practices and mother awareness.
- A structured questionnaire will be used to gauge mothers' awareness and knowledge of the significance of neonatal vaccinations. A sample of about 210 moms whose children were born throughout the mentioned time frame will be the focus of this study.

- The objectives of the maternal survey include:
  - Assessing knowledge of the national immunization schedule is one of the goals of the maternity survey.
  - Gaining insight into how women see the importance and timing of birth-dose vaccinations.
  - Determining the part medical professionals play in teaching moms.
  - Evaluating any obstacles to receiving immunization services after being discharged.
  - To identify knowledge gaps and areas in need of targeted health education, these replies will be examined.

- In addition to polling moms, 30 to 40 medical professionals who are either directly or indirectly involved in the vaccination process such as physicians, staff nurses, and immunization officers their qualitative and quantitative data gathered for the study.

- The following are important topics addressed in this data collection:
  - Knowledge of and compliance with vaccination policies and procedures.
  - The methods used to give birth-dose vaccinations within a day of the baby's birth.
  - The difficulties faced by medical professionals while advising mothers.
  - Coordination with the immunization department and documentation procedures.

- Inclusion Criteria:
  - Mothers who gave birth to live babies (apart from stillbirths or neonatal deaths prior to discharge).
  - Mothers who are ready to participate and willing to talk.
  - Mothers who gave birth at the hospital between April 1, 2024, and March 30, 2025.
  - Healthcare professionals who work directly with infant care or vaccination, such as nurses, paediatricians.
  - Healthcare providers those who are accessible when the data is being collected.

- Exclusion Criteria
    - Mothers of infants who died before being released from the hospital or stillborn.
    - Mothers who gave birth to referrals or out born children outside of a hospital.
    - Employees in administration or medicine who do not provide infant care or vaccination services
    - Healthcare professionals who were unavailable during the study period or on extended leave.

- Between April until the sixth week of May, about 244 follow-up calls were placed. In accordance with the hospital's future immunization plan, vaccination packages will be made available to kids between the ages of six weeks and six months going ahead.

3.4 Data Collection Tool

- Vaccination dates and schedules are tracked from the electronic medical record (EMR) system using the hospital management information system (HMIS).
- Pharmacy Sales Records Assisting in the verification of the real administration and acquisition of vaccines.
- Mothers were given a structured questionnaire that covered demographics, vaccination-related knowledge, attitudes, and behaviours (KAP).
- Follow-up calls given to parents whose infants missed doses in order to find out the precise cause and scheduling the appointment.

3.5 Definitions and Variables

- Vaccine Retention: All recommended doses at birth, six, ten, fourteen, and six months must be completed.
- Drop out the percentage of children who did not receive one or more immunizations after their first dose at birth is known as the "dropout rate.
- Strategic Intervention any planned hospital-based action (such as an SMS reminder, discharge planning, or educational counselling) that aims to improve vaccine adherence is considered a strategic intervention.

3.6 Calculations

- Vaccination Due Dates: Using the child's date of birth (DOB), the dates for standard childhood vaccines were determined
    - The vaccination is scheduled for the sixth week of life, which is equal to the date of birth (DOB) +42 days
    - 10th Week Vaccination: Scheduled at 10 weeks of age, determined by adding
      (DOB) + 98 days.
    - 14th Week Vaccination: Scheduled at 14 weeks of age, determined by adding (DOB) + 98 days.
    - Sixth Month Vaccination: Measured as DOB + 183 days, this vaccination is scheduled at six months of age.
    - Retention Rate for each vaccination time point in order to evaluate the continuity and adherence to the vaccination schedule:
    - Number of Vaccinations Administered: This is the total number of children who received the scheduled vaccination at each due date;
    - Number of Eligible New-borns: This is the total number of new-borns who reached the respective vaccination age during the study or tracking period.

3.7 Rational for Methodological approach:

To obtain a thorough grasp of new born vaccine retention in a maternity and paediatric hospital context this study used a mixed method approach that integrated both qualitative and quantitative techniques.

This methodological choice was grounded in the need to combine statistical rigor with contextual insight both of which are critical in addressing complex healthcare behaviour challenges such as immunization adherence.

- **Quantitative Component (Census Sampling)**
    - Using census sampling of all new born delivered at the hospital during the study period ensured that the entire population was represented minimizing bias.

- This comprehensive dataset provided an accurate assessment of vaccine retention trends at key milestones-6 weeks, 10 weeks,14 weeks,6 months.

- **Qualitative Component (Understanding behavioural and social determinants)**
  - The qualitative tools such as interviews with mothers and key healthcare staff.
  - Follow up calls for vaccination and appointment scheduling helped to know the reason behind low vaccination retention.

By capturing these voices, the study ensured that interventions were not only evidence based but also socially and behaviourally informed increasing their real world applicability and potential for adoption.

3.8 Summary of Methodology:

In order to assess new-born immunization retention rates at Cloud Nine Hospital, HRBR Unit, the current study used a mixed-methods methodology. Using quantitative data gathered from the HMIS and pharmacy sales records. follow-up contacts with parents or guardians of infants who missed planned immunizations were conducted to obtain qualitative insights.

CHAPTER:4

RESULT AND FINDINGS

CHAPTER 4: RESULT AND FINDINGS

The results of both quantitative and qualitative analyses are highlighted in this section, the findings are based on a census of all new-borns delivered at the hospital during the study period, as well as their vaccine follow-up data, which were collected via the Hospital Management Information System (HMIS), pharmacy sales, and structured questionnaires asked to mothers.

- Vaccine Retention Trends

  Retention rates for immunizations administered at six weeks, ten weeks, fourteen weeks, and six months after delivery are shown by quantitative data. This section provides insight into the general vaccination compliance of new-borns delivered to hospitals by identifying trends in adherence and drop-out rates.
- Obstacles to Prompt Vaccination

  The causes for missed or postponed vaccines are better understood thanks to qualitative information gleaned from structured interviews and follow-up contacts. Themes like ignorance, socioeconomic difficulties, poor communication, and structural inefficiencies are examined.

4.1 STRUCTURED QUESTIONS FOR MOTHERS:

A short and simple structured questionnaire was given to mothers to evaluate their knowledge, experiences, and challenges concerned with neonatal immunization following hospital discharge. With regards to knowledge of their baby's vaccination dates subsequent to discharge, when asked, "Did you know when your baby's vaccinations were going to happen post-discharge?", 58% had said, "yes", while 42% said "no", indicating there was a considerable deficit in knowledge.

An important finding was that 81% of mothers thought that mobile reminders by SMS or WhatsApp would help them remember the appointment date

These findings indicate a need for a better communication process, a follow-up system, and better communication tools to assist mothers to remember and attend for vaccinations.

4.2 Vaccination retention data of financial year approximately 2500 new born (DOB) from (01-04-2024 to 30-03-2025).

Taking into consideration the total targeted population and achieved sales of vaccines prescribed.

TABLE 4.2

Apr-24	6 WEEK	10 WEEK	14 WEEK	6 MONTH	TOTAL
TARGET	147	151	136	165	599
ACHIEVED	62	56	49	60	227
Percentage	42%	37%	36%	36%	38%

May-24	6 WEEK	10 WEEK	14 WEEK	6 MONTH	TOTAL
TARGET	160	164	161	178	663
ACHIEVED	63	59	57	11	190
TOTAL	39%	36%	35%	6%	29%

Jun-24	6 WEEK	10 WEEK	14 WEEK	6 MONTH	TOTAL
TARGET	126	145	160	128	559
ACHIEVED	31	56	53	36	176
TOTAL	25%	39%	33%	28%	31%

Jul-24	6 WEEK	10 WEEK	14 WEEK	6 MONTH	TOTAL
TARGET	121	125	142	148	536
ACHIEVED	42	31	57	56	186
TOTAL	35%	25%	40%	38%	35%

Aug-24	6 WEEK	10 WEEK	14 WEEK	6 MONTH	TOTAL
TARGET	121	122	125	163	531
ACHIEVED	53	42	27	59	181
TOTAL	44%	34%	22%	36%	34%

Sep-24	6 WEEK	10 WEEK	14 WEEK	6 MONTH	TOTAL
TARGET	127	123	118	144	512
ACHIEVED	51	44	38	61	194

TOTAL	40%	36%	32%	42%	38%

Oct-24	6 WEEK	10 WEEK	14 WEEK	6 MONTH	TOTAL
TARGET	145	125	132	146	548
ACHIEVED	61	37	47	58	203
TOTAL	42%	30%	36%	40%	37%

Nov-24	6 WEEK	10 WEEK	14 WEEK	6 MONTH	TOTAL
TARGET	135	144	119	123	521
ACHIEVED	50	53	34	29	166
TOTAL	37%	37%	29%	24%	32%

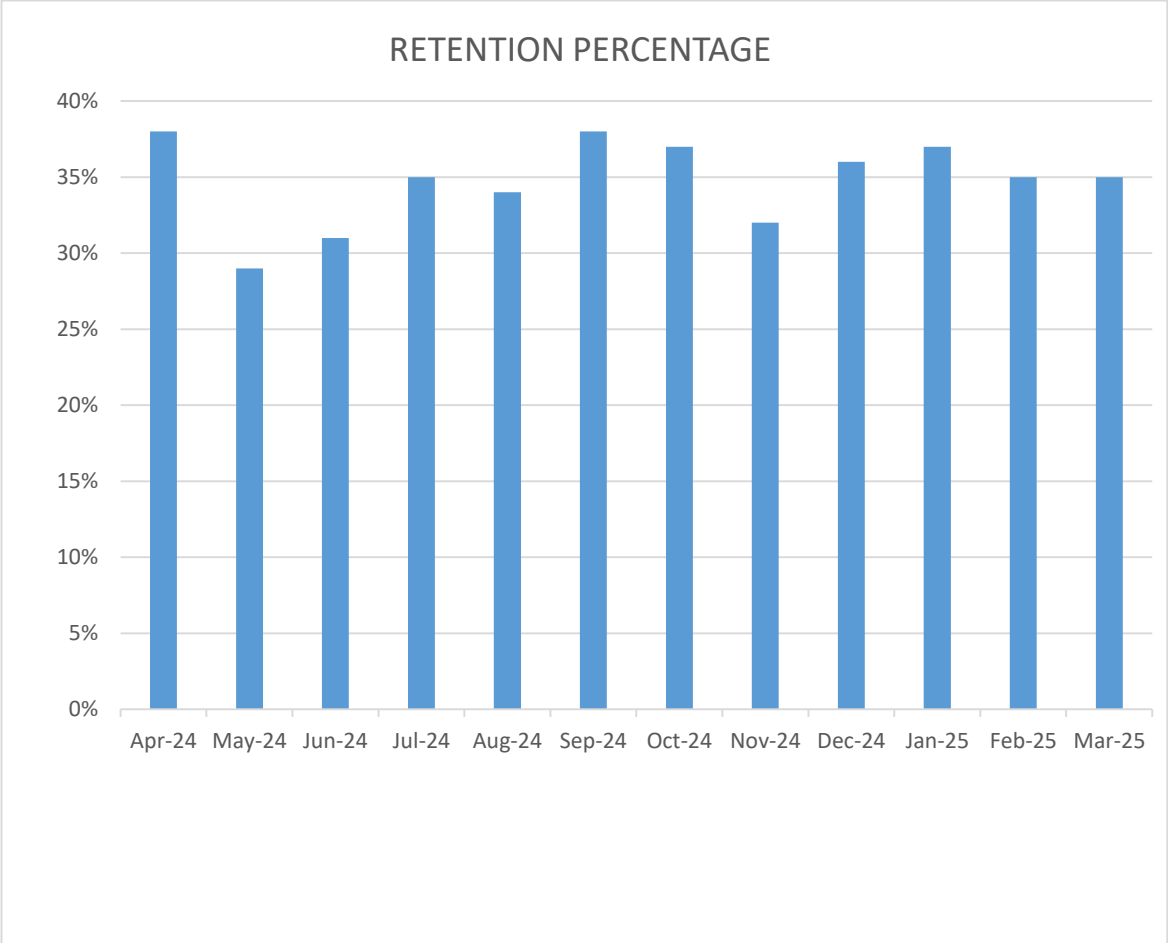
Dec-24	6 WEEK	10 WEEK	14 WEEK	6 MONTH	TOTAL
TARGET	166	138	148	123	575
ACHIEVED	72	51	40	44	207
TOTAL	43%	37%	27%	36%	36%

Jan-25	6 WEEK	10 WEEK	14 WEEK	6 MONTH	TOTAL
TARGET	145	166	145	138	594
ACHIEVED	59	60	52	48	219
TOTAL	41%	36%	36%	35%	37%

Feb-25	6 WEEK	10 WEEK	14 WEEK	6 MONTH	TOTAL
TARGET	133	131	145	108	517
ACHIEVED	57	48	35	40	180
TOTAL	43%	37%	24%	37%	35%

Mar-25	6 WEEK	10 WEEK	14 WEEK	6 MONTH	TOTAL
TARGET	132	144	143	140	559
ACHIEVED	44	59	46	46	195
TOTAL	33%	41%	32%	33%	35%

4.2.1 Graph showing retention rate of vaccine of financial year:



Cloud nine hospital HRBR is having constant retention rate of financial year which comprises of 6 week 10 week ,14 week and 6 month vaccination schedules over the period having not much variations.

4.3 Follow-ups calls for vaccination targeting 6-week vaccine (1-4-2025 to 30-5-2025)

Total 244 follow-up calls have been made within 2 months of duration of study.

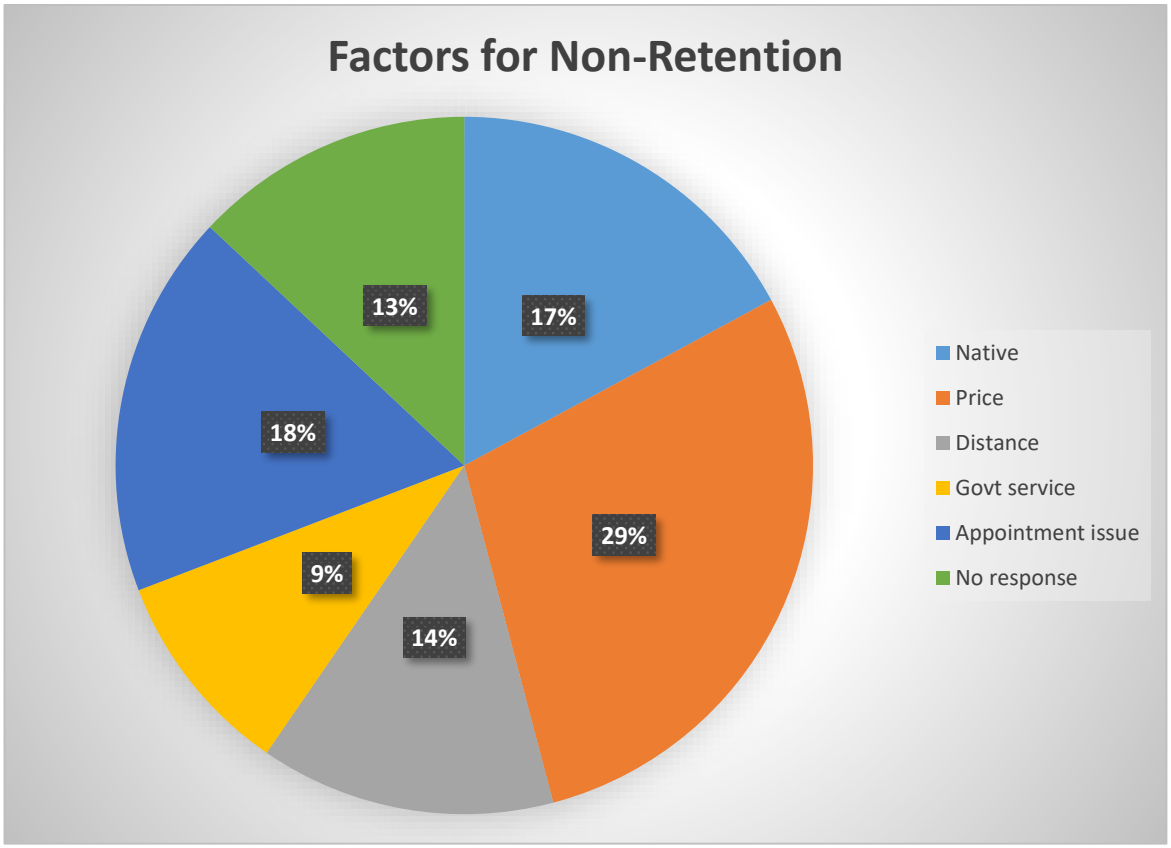
The primary data has been collected by giving the follow ups calls to the new- born parents regarding the 6- week vaccination.

TABLE 4.3

Data regarding several reasons with the parents who are taking hospital vaccination services and who are not coming.

HOSPITAL SERVICE AVAILING	**98**
GOING TO NATIVE AFTER DELIVERY	**25**
HIGH PRICED AND EXPENSIVE	**42**
MORE DISTANCE FROM HOSPITAL	**20**
TAKING FROM GOVT. SERVICES	**14**
APPOINTMENT ISSUES	**26**
NO RESPONSE TO CALL	**19**

4.3.1 Graph representing reasons for not availing cloud nine vaccination services:



4.4 Meaningful data of vaccination from approximately 30-40 healthcare workers:

Key themes driving vaccine dropout were identified through healthcare professionals:

- Inadequate appointment scheduling and discharge plans; inconsistent counselling.
- Imprecise staff communication
- Obstacles such work schedules, family responsibilities, and transportation

CHAPTER:5

DISCUSSION

CHAPTER 5: DISCUSSION

This research aimed to gauge the retention rates, or failure of retention, for vaccines of infant's neonates born at Cloud Nine Hospital, Bangalore, and reasons for dropout or late following schedules for immunization. This research also wanted to provide evidence-based recommendations for realistic and suitable recommendations for retention rates. This study was mixed methods, with trends gleaned from quantitative data and qualitative data from both parents and health professionals, producing a more holistic image of the immediate gaps that exist in neonatal vaccination services, and identifying relevant implications for improving the quality of service provided to parents in a private healthcare context, namely, at Cloud Nine Hospital.

5.1 Summary of Vaccine Retention Patterns

Quantitative indicators from HMIS and pharmacy records all show retained vaccines at low percentages, presumably in this case where the retention was measured when the children were 6 weeks, 10 weeks, 14 weeks, and 6 months old, respectively. Of these eligible new-borns, only approximately 35%–38% were on-time with their scheduled vaccinations IOI (in other words, adherence rates).

Adherence was consistently low and did not exhibit a discernible upward trend over the course of the financial year 2024–2025; seasonal fluctuations and follow-ups notwithstanding. Notably, the 6-month vaccination time point saw unacceptably high dropout rates signalling that adherence may decrease in steepness with time post-discharge**.**

The findings correlate with the literature suggesting decreasing adherence after engaging with the healthcare system. This has proven especially true for private hospitals where there are likely no structured systems for following up.

The Universal Immunization Programme (UIP), Organisation (UIP), provides coverage in public health contexts, but the absence of structured follow-up and subsequent communication with a parent or guardian means that private institutions face a unique challenge - particularly in urban contexts where family structures may include living in nuclear households with limited support systems**.**

5.2 Barriers Identified from Post-Call and Parent Feedback

The follow-up calls to 244 families of new-borns who were due for the 6-week vaccination produced rich qualitative data related to non-uptake. These reasons were further divided into logistical, financial, systemic, and behavioural barriers:

- Financial - 42 families citied the cost of vaccines as a major barrier. This is important from a private hospital point of view given that out of pocket costs can become expensive for middle-class families.
- Postnatal Family Relocation to Home - 25 families followed the traditional course of returning to their native place after birth and could no longer access the hospital for follow-up care. This is evident due to the customary practice of postnatal relocation in India and supports the call for more effective discharge planning and advice on vaccinations around relocations to different contexts where vaccination may take place.
- Distance - 20 families noted distance to the hospital as a barrier. This clearly supports the notion that the reminders and follow-up needed to work towards a de-centralised follow-up either through partnership with nearby vaccination centres, or as the research indicates being very particular about their distance to be able to access them after birth**.**
- Appointment scheduling and contact: 26 families had troubles with getting appointments or lack of follow up with the hospitals. Additionally, 19 families did not answer calls which may indicate lack of awareness, lack of trust, or lack of contact information.
- Preference for Government Services: 14 families preferred to use government-provided immunization services. This navigation between systems suggests some parents see the public health system as more accessible or more affordable for routine immunizations, even if the delivery occurred in a private hospital.

5.3 Healthcare Providers' Perspectives on Institutional Gaps

Responses received from 30–40 healthcare providers indicated that there were persistent themes: the absence of structured discharge planning, inconsistent counselling practices, and breakdowns in communication between the maternity department and immunization department. In many cases, vaccination counselling consisted of either a verbal reminder at discharge, or written materials that did not address differences in health literacy for mothers.

In addition, staff acknowledged a lack of formal processes for tracking or following up on immunizations, or communicating with families after discharge. This highlights an institutional gap—while private hospitals can provide excellent delivery and postpartum care for new-borns, they often lack the foundational of infrastructure for preventive and follow-up care.

There was also a disconnect between what healthcare providers know in terms of practice, and what is operational practice. Healthcare providers understood that immunizations at the appropriate time were important, but without some workflow barriers being removed, with environmental barriers in terms of not clearly delegating responsibilities, and a lack of automation such as EMR reminders or patient navigation, their ability to ensure that adherence would be limited.

5.4 Interventions and Potential Impact

The study suggests that low-cost, high-impact interventions can improve vaccine retention. Conducting a structured session of parental counselling before discharge is viewed as a promising intervention to support better understanding and retention of immunization schedule. This session could be supported by visually easy tools so that the parents find it easy to comprehend and retain the schedule of immunization. The facilitation of digital reminders of children's vaccination schedules such as SMS reminders, WhatsApp notifications, or notifications by electronic medical records (EMRs) systems by the hospital can target improvements to adherence easily.

Planning for discharge proactively by identifying where a family intends to relocate postnatal and providing options for alternate vaccine centres, particularly at relatives' homes in their native place or nearby government clinics can minimize dropouts. Coordination between hospitals and local immunization authorities to promote alternate vaccination canters can be supportive.

Finally, training hospitals' staff to communicate a consistent message and empower them to promote vaccination during the hospital stay and discharge as part of the system to strengthen parental motivation and trust in vaccine compliance and process.

5.5 Implications for Private Healthcare Sector

This investigation has important implications for private healthcare institutions in urban India. As institutional deliveries in private hospitals increase, so should hospitals' accountability for maintaining continuity of care beyond discharge.

Public hospitals are integrated within national health programs and therefore have accountability and less chaos within systems of care while, some private hospitals are not regulated by the department of health to the same degree and, do not have a well-considered or structured follow-up system.

Private hospitals can take advantage of evidence-based strategies in bridging the gap in postnatal care; for example, giving better discharge counselling, better digital communication, and, including strategies that offer routine follow-up. Vaccine adherence and compliance should be a quality metric in the care of new-borns and infants in private hospitals and, should not be thought of as a separate service.

CHAPTER:6

RECOMENDATIONS AND STRATEGIC FRAMEWORK

CHAPTER 6: RECOMENDATIONS AND STRATEGIC FRAMEWORK

6.1 Recommendations:

From the study findings, the following actionable recommendations are suggested to increase vaccine completion rates for neonates in private hospital settings:

- Structured discharge counselling

  Establish a standardized, structured counselling approach at the time of discharge with standardised visual charts, take-home immunization cards, and systematic verbal explanations of the immunization schedule by qualified nursing staff or counselling personnel;
- Digital reminder

  Adopting automated SMS and WhatsApp reminders according to the infant's date of birth and upcoming vaccine due dates with consistent multilingual messages, sent three times (i.e. 3 days before due date, due date, and missed date)
- Integrated follow-up system

  An in-hospital tracking dashboard implementing HMIS to track upcoming vaccinations with a vaccination coordinator track follow-up and support families with high-risk or relocating timelines.
- Cost-based available vaccine packages

  Provide vaccine packages that have different tiered options based on affordability, have a transparent rationale behind pricing tiered options for cost, where possible link the package tiers to available government schemes to limit financial dropouts.
- Training for Health Care Staff

  Provide routine training workshops to ensure that all maternity and paediatric staff are working together in relation to vaccination protocols and discharge planning tasks. Training should include consistency in counselling and compassion.

6.2 Strategic Framework for improving immunization retention:

TABLE 6.2

COMPONENT	KEY ACTIONS	STAKEHOLDER INVOLVED	TIMELINE
Assessment	Identify baseline for retention and dropout	Quality and medical record team	Monthly
Counselling	Discharge time education regarding vaccination	Nursing staff and paediatricians	Ongoing
Digital communication	Automate SMS and alerts	IT department	1-2 months rollout
Follow –up co-ordination	Live tracking and initiate follow-up calls	Front desk	Weekly for upcoming week
Affordability strategy	Introduce flexible packages	Hospital management team	Quarterly revision
Staff training	Discharge communication	Clinical training team	Biannual

This framework is intended to be scalable, affordable and patient centred ensuring that immunization services are not only available but also accessible and accepted by every family leaving the hospital.

CHAPTER:7

CONCLUSION

CHAPTER-7 CONCLUSION

This study aimed to understand the issues and behaviours related to neonatal vaccine retention in a private health care facility, using Cloud Nine Hospital in Bangalore, India, as a case study. This study found the vaccine availability and structured birth practices coexist, there remained low retention rates postnatal, averaging less than 40% on average between the key immunization engagement occasions (6, 10, 14 weeks and 6 months).

This study employed mixed-methods and identified a few reasons for the dependence of service availably and uptake on the parents. The parents specified a financial barrier, geographical mobility during the postnatal period, challenges with appointments, and poor communication. The health providers noted inconsistency in discharge programming and counselling, lack of integrated interdepartmental functioning, and the absence of an ongoing systematic follow up. These observations highlight that vaccine dropouts are due to institutional inefficiencies, as well as challenges related to the socioeconomic situation, behaviours, and access.

The originality of this study is not only identification of the gaps but also a few low-cost and context specific, and feasible interventions to mitigate the gaps encountered in the study, which included improved, structured education on discharge, digital reminders for vaccination, and using the hospital information system more effectively for tracking vaccination. The study proposed a flexible framework for similar contexts for implementation of ongoing retention support.

By improving internal hospital processes of the Rapid Vaccination Referral Service, as well actively engaging families, a lot can be done to improve vaccination coverage on time. Improvements to timely vaccine coverage should reduce preventable childhood illness, and create opportunities to develop trust and continuity of care in private health care systems. Overall, the results of this study can provide a basis for continued, sustainable and scalable changes to immunization service delivery.

CHAPTER 8

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REFERENCES

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