

Summer Internship Report
At
Piramal Swasthya Foundation



(May 12th – July 25th, 2025)

A Report

By

Dr. Raman John Shrivastava

MBA-Hospital and Health Management 2024-2026

Roll No.- **2046**

Under the Mentorship of

Dr. Swapnil Gadhave

(Assistant Professor- Digital Health)



IIHMR UNIVERSITY, JAIPUR

CERTIFICATE OF INTERNSHIP COMPLETION FROM PIRAMAL SWASTHYA

This is to certify that **Dr. Raman John Shrivastava** of Batch **HM29** of IIHMR University, Jaipur has worked with our organization for his summer internship May 12th, 2025 to July 25th, 2025. The overall performance shown by him during the period was **excellent**. This certificate is being issued to meet the requirements of the IIHMR University.

Date: July 25th 2025



Name: Dr. Tanmay Mahapatra

Designation: Core Team Member

IIHMR University Faculty Mentor Approval

This is to certify that **Dr. Raman John Shrivastava** of academic year 2024-26 of Institute of Health Management Research has prepared a poster with respect to his summer internship held during May-July 2025.

He has carried out work as per the guidelines. His poster is approved for presentation.

Date: 29/07/2025



Dr. Swapnil Gadhave
Assistant Professor

Organization Profile

Mission

Building Bharat Through *Leadership Development, Digitization, Decentralisation and Inclusion led by Women and Youth*

Vision

To transform health, education, water, and social sector ecosystems through partnerships, high impact solution, and thought leadership. Aligned with the Sustainable Development Goals, Piramal Foundation partners with governments, international and national organizations, and academia to help improve the delivery of government services in line with its philosophy of '*Doing Well and Doing Good*'

Core Values

Knowledge, Action, Care, Impact

Organogram

Core Team Member

Senior Program Director

Program Director

Senior Program Manager

Program Manager

Senior Program Leader

Program Leader

Project Details

Objective

To measure the overall digital health competency of CHO's across various domains and to infer the implications of assessed competencies on broader health system strengthening.

Research Methodology

-Study Design- This is the secondary data analysis of quantitative, cross-sectional study design.
-Study Sample- A total of 275 CHO's from the Health and Wellness Centres across Bihar, India

SWOT Analysis

Strengths

- Existing Digital Exposure
- Government Support
- Structured Competency Dictionary and Tool Available
- Data Availability

Weaknesses

- Complex Tool Design and Lack in Depth
- Low Digital Literacy Among Some CHO's
- Difficult to conduct in-depth interviews and assessment due to various constraints like time and resources.
- Limited Training and its Follow-up

Opportunities

- Remaining defined competencies and the sub-competency levels can be measured when basic level goals achieved
- Tool Simplification
- Scaling beyond Bihar (and UP)

Threats

- Resistance to Technology Use
- Inconsistent Internet/Device Access
- Sustainability Risk Without Monitoring

Theoretical vs Practical

Theoretical

- Classroom learnings, textbooks and lectures.
- Understanding the What and Why.
- Ideal and controlled scenarios.

Practical

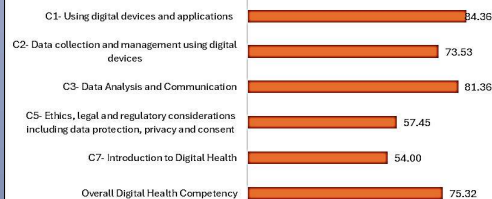
- Fieldworks, real time tasks,
- Learning the How
- Real world and unpredictable settings.

Result

Variable	N	Mean	Minimum	Maximum
c1_score_p_100	275	84.36	0.00	100.00
c2_score_p_100	275	73.53	20.00	100.00
c3_score_p_100	275	81.36	0.00	100.00
c5_score_p_100	275	57.45	0.00	100.00
c7_score_p_100	275	54.00	0.00	100.00
Overall_score_p_100	275	75.32	23.53	100

N=275

DIGITAL COMPETENCY OF CHO's



About Internship

Challenges Faced

- 10 weeks felt too short to absorb so much.
- Struggled initially to link theoretical knowledge with practical exposure.
- Adapting to rigor of real world data handling.
- Balancing field visits, office work, internship work and sessions and software learning.

Key Learnings

- Gained hands-on experience on qualitative and quantitative analysis and tool development
- Developed technical skills in SAS and MS-Excel
- Applied theoretical learnings from classroom into use during internship projects and field visits.

Reporting Week-1

Name of the Organisation: Piramal Swasthya, Patna

Area/ Department/ Project of Summer Internship Program: Research, Monitoring, Learning & Evaluation (RMLE) Department

Name of the Student: Raman John Shrivastava

Roll no: 2046

Stream: HM 29

Week no: 1

From: 12/05/25 to 17/05/25

Activity Done	• 12/05/2025: Participated in an orientation session introducing the Piramal Foundation, the RMLE department, and expectations for the internship. Reviewed the fundamentals of SAS software in a hands-on technical session, aimed at supporting future data analysis tasks. • 13/05/2025: Engaged in transcription of qualitative data derived from interviews under the ongoing RMLE project. The transcription process was critical in preparing for subsequent thematic analysis. Consulted with senior researchers to gain perspective on analytical expectations and were directed to review the IPHS 2022 Guidelines, MNH Toolkit, and other operational frameworks for public health programs. Attended an evening session on Research Methodology, reinforcing qualitative techniques and their practical utility. • 14/05/2025: Conducted a field visit to DulhinBazaar Block (Anganwadi Code - 10230070516), District Patna, to observe the VHSND (Village Health, Sanitation, and Nutrition Day) activities. Assessed frontline service delivery by ASHAs and ANMs, including routine immunization, antenatal counselling, and nutrition advice. Identified operational gaps such as lack of instruction on Kangaroo Mother Care (KMC), poor dissemination of Godbharai scheme due to sociocultural barriers (e.g., fear of 'nazar lagna'), and insufficient counselling for severely anaemic mothers (e.g., 20-year-old, HB=6, weight=40kg). Observed digital health tools used by FLWs including Ashwin, m-ASHA, U-WIN, ANMOL, and others depicted in the digital tools framework. • 15/05/2025: Participated in a technical session on foundational SAS applications. Continued transcription of interview data for qualitative research. Reviewed the structural approach for qualitative coding. Later, attended a short hands-on session on Microsoft Excel for data organization and visualization.
---------------	---

	• 16/05/2025: Attended a technical revision and application session on SAS basics. Participated in an expert-led discussion on key programmatic areas including RMNCHA+N, high-risk pregnancies, anaemia management (including recent trends like Iron Sucrose and Ferric Carboxy Maltose), family planning techniques, contraceptive practices, and maternal-child nutrition, health infrastructures (BEmONC and CEmONC). Reviewed national guidelines including MNH Toolkit and IYCF practices, understanding their integration in program design and monitoring. • 17/05/2025: Undertook a field visit to Harnaut Block, Nalanda District. Observed the listing and household data collection activities focused on women with children under 2 years, segmented into age brackets (0–5, 6–11, and 12–23 months). Assessed the coverage and quality of immunization, deworming, Vitamin A supplementation, and IFA syrup distribution. Conducted critical observations on data collection instruments. Evaluated awareness and application of High-Risk Pregnancy criteria, postnatal care, breastfeeding guidance, contraception counselling, scheme utilization (e.g., Godbharai, PMMVY), and ABHA card registration. Identified a lack of digital aids used by FLWs to educate mothers.
Linking theory (Classroom learning) with practice at your organisation	• Applied classroom understanding of research methodology during transcription and upcoming qualitative data analysis. • Leveraged learnings from SAS and MS Excel modules to manage and interpret real-world health datasets. • Integrated MNH Toolkit, RMNCHA+N, IYCF, IPHS guidelines into field observations and program evaluations. • Identified digital tools (e.g., ANMOL, U-WIN, m-ASHA, ASHWIN) aligned with concepts learned in Digital Health coursework. • Observed and evaluated FLW practices in real-time, relating to theoretical training on public health systems and maternal-child care.
Gaps identified on the working area.	• Limited usage of digital IEC materials by FLWs during patient counselling and education. • Incomplete health counselling by ANMs and ASHAs in rural parts of Bihar (e.g., no KMC instructions, inadequate anaemia management, etc.).

	• Cultural barriers preventing full utilization of government schemes (e.g., Godbharai scheme underutilized due to fear of 'nazar'). • Lack of urgency in handling high-risk maternal health cases (e.g., severe anaemia not escalated). • Exclusion of societal, cultural and behavioural aspects in the data collection tool. • Absence of postnatal dietary guidance and inadequate counselling on breastfeeding, contraception, and postpartum care.
Suggestions for improvement	• Develop and deploy region-specific digital IEC tools for FLWs to use during community interactions. • Introduce structured refresher training modules for FLWs on critical health services including high risk pregnancies (like anaemia management), KMC, and nutritional counselling. • Redesign the listing and household survey tools to include behavioural and cultural considerations based on field findings. • Strengthen communication strategies to counter cultural myths that hinder scheme uptake.
Plan for the next week	• Complete transcription of qualitative interviews and begin thematic analysis. • Review and revise data collection tools in collaboration with the research team. • Evaluate effectiveness and challenges in digital tool usage by FLWs. • Attend advanced sessions on SAS and data interpretation techniques, research methodologies, data management and cleaning. • Conduct further field observations to validate gaps or align with the on-going project.

Reporting Week-2

Name of the Organisation: Piramal Swasthya, Patna

Area/ Department/ Project of Summer Internship Program: Research, Monitoring, Learning & Evaluation (RMLE) Department

Name of the Student: Raman John Shrivastava

Roll no: 2046

Stream: HM 29

Week no: 2

From: 19/05/25 to 24/05/25

Activity Done	- Continued transcription of qualitative interviews collected during fieldwork. This task involved converting audio content into structured textual data to be used for analysis. - Initiated the process of qualitative analysis of the transcribed material using thematic approaches. Started identifying emerging codes and organizing them into categories for further analytical insights. - Attended ongoing SAS training sessions to enhance statistical and data analysis proficiency, with focus on applying foundational techniques to health datasets. - Participated in a session focused on data cleaning and preparation using Microsoft Excel. Learned and practiced functions such as removal of duplicates, logical sorting, and basic data transformation relevant for large-scale survey datasets. - Attended a lecture on advanced concepts of research methodology. The session emphasized structuring qualitative frameworks and integrating findings into real-world program evaluations.
Linking theory (Classroom learning) with practice at your organisation	- Applied classroom-based qualitative research methodologies in transcription and initial analysis of interviews. - Utilized Excel data cleaning tools aligned with lessons from operations and research data management modules. - Practiced SAS-based commands learned in theoretical sessions to support real-time data processing tasks.
Gaps identified on the working area.	- Interview data presented variation in quality due to inconsistent probing during data collection. - Manual transcription proved time-consuming and may benefit from semi-automated tools.

	• Some inconsistencies noted in the structure of interviews which may impact comparability across respondents.
Suggestions for improvement	• Explore use of transcription software or AI-assisted tools to accelerate manual efforts. • Encourage incorporation of cross-verification practices during transcription to maintain data fidelity.
Plan for the next week	• Complete ongoing qualitative analysis of all transcribed interviews and generate preliminary insights. • Continue SAS training with focus on application of intermediate functions. • Participate in review and feedback sessions for improved data collection tool design. • Potential second field visit to validate observations and contextualize qualitative findings.

Reporting Week-3

Name of the Organisation: Piramal Swasthya, Patna

Area/ Department/ Project of Summer Internship Program: Research, Monitoring, Learning & Evaluation (RMLE) Department

Name of the Student: Raman John Shrivastava

Roll no: 2046

Stream: HM 29

Week no: 3

From: 26/05/25 to 31/05/25

Activity Done	- Continued intensive transcription of qualitative interviews conducted during field visits. Ensured accuracy and completeness in capturing the spoken data into structured text. - Progressed significantly in the qualitative data analysis process. Extracted major themes and sub-themes using manual coding approaches to identify patterns, common narratives, and outliers. - Participated in advanced training sessions on SAS software. Focus was placed on intermediate and advanced functions applicable in health-related data analysis and monitoring. - Attended a research methodology session that focused on deepening the understanding of analytical frameworks, especially thematic content analysis, triangulation techniques, and coding reliability. - Engaged in an advanced data cleaning and management session using Microsoft Excel. Applied functions such as conditional formatting, logical functions (IF, AND, OR), advanced filters, and error tracing to clean and manage health datasets more efficiently.
Linking theory (Classroom learning) with practice at your organisation	- Applied theoretical knowledge of qualitative research and thematic coding learned in academic modules to real-world interview data. - Integrated SAS training into live datasets to explore descriptive analytics and prepare data for further statistical processing. - Enhanced Excel proficiency through applied data cleaning and transformation techniques relevant to healthcare surveys and monitoring tools. - Strengthened understanding of qualitative reliability and research validity through guided sessions and practical tasks.

Gaps identified on the working area.	• Variability in interviewer techniques resulted in inconsistent depth across transcripts, affecting thematic comparison. • Time-intensive manual transcription highlighted the need for efficiency tools to manage large datasets. • Lack of a centralized framework for coding across team members may lead to interpretive variability in theme extraction.
Suggestions for improvement	• Recommend development of a unified codebook and thematic structure to maintain consistency across analysts. • Suggest adoption of transcription software or speech-to-text tools for initial drafts to reduce manual load. • Incorporate inter-coder reliability checks to improve credibility and reduce subjective bias in qualitative analysis.
Plan for the next week	• Finalize thematic categorization and begin generating analytical summaries. • Continue with advanced SAS practice focused on inferential analysis. • Initiate working on literature review for the topic decided for my internship- “Digital competencies of FLWs and its role in health system strengthening (CHO, RMNCHA+N)”

Reporting Week-4

Name of the Organisation: Piramal Swasthya, Patna

Area/ Department/ Project of Summer Internship Program: Research, Monitoring, Learning & Evaluation (RMLE) Department

Name of the Student: Raman John Shrivastava

Roll no: 2046

Stream: HM 29

Week no: 4

From: 01/06/25 to 07/06/25

Activity Done	• Completed the transcription of qualitative interviews conducted with members of the SOGI (Sexual Orientation and Gender Identity) community, focusing specifically on male respondents. Ensured accurate reflection of verbal data and context-sensitive language. • Performed structured data labelling and organization of transcribed content in preparation for qualitative analysis. Developed initial codes aligned with thematic areas based on recurring patterns and context. • Conducted thematic extraction from the labelled transcripts to identify emerging insights and themes. Developed a thematic matrix to map codes to broader categories for analysis and reporting. • Conducted thematic extraction and analysis of Focus Group Discussion (FGD) data related to challenges faced by community women in joining Self Help Groups (SHGs). Identified key barriers such as social stigma, financial dependence, and lack of awareness, and categorized responses under relevant sub-themes. • Made summary reports of all the thematic coding done following thematic extraction. • Continued with the advanced SAS training sessions, applying learned techniques to sample health datasets and practicing commands related to data manipulation and exploratory statistics. • Attended a focused session on data cleaning in Excel, revisiting techniques such as duplicate removal, error detection, and use of logical formulas to enhance data integrity. • Participated in research methodology and qualitative analysis sessions. The discussions covered theory behind coding approaches, theme validation, saturation concepts, and data triangulation.
----------------------	--

Linking theory (Classroom learning) with practice at your organisation	• Applied qualitative research techniques taught in class including transcription protocols, thematic extraction, and coding frameworks. • Practiced SAS data functions and manipulations in alignment with classroom training to strengthen data interpretation capabilities. Applied Excel data cleaning practices taught in coursework to manage inconsistencies in large datasets. • Reinforced academic concepts related to qualitative rigor, such as saturation, inter-coder reliability, and thematic categorization.
Gaps identified on the working area.	• Difficulty in interpreting culturally sensitive responses from SOGI interviews due to absence of contextual annotations. • Lack of standard templates for transcription increased time spent on formatting and organization. • Need for more robust inter-coder agreement process to reduce subjective bias in theme extraction.
Suggestions for improvement	• Introduce training sessions on handling sensitive and identity-based qualitative data for increased empathy and accuracy. • Develop standardized transcription and labelling templates to streamline qualitative data handling. • Initiate team-based coding review meetings to improve reliability and consistency of thematic outputs.
Plan for the next week	• Finalize the thematic coding framework and prepare detailed analytical narratives for SOGI interviews and SHG-related FGD findings. • Continue SAS training focused on comparative statistical analysis. • Conduct a validation session for current findings with peers or mentors. • Begin preliminary drafting of insights and observations from the qualitative analysis for internal reporting.

Reporting Week-5

Name of the Organisation: PIRAMAL Swasthya, Patna

Area/ Department/ Project of Summer Internship Program: Research, Monitoring, Learning & Evaluation (RMLE) Department

Name of the Student: Raman John Shrivastava

Roll no: 2046

Stream: HM 29

Week no: 5

From: 09/06/25 to 14/06/25

Activity Done	• Compiled and developed a summary report based on the thematic extraction from the Focus Group Discussion (FGD) conducted with community women regarding challenges in joining Self Help Groups (SHGs). Structured the report into themes, sub-themes, and representative quotes to highlight critical insights and community-level barriers. • Continued participation in advanced SAS training sessions. Focused on applying statistical procedures, interpreting outputs, and integrating them into public health reporting formats. • Attended an Excel-based session focused on advanced data cleaning techniques including date and time formatting, removal of blank entries, use of autofill for series, and practical functions for efficient data management. • Participated in a research methodology session covering design considerations for advanced data analysis, including how to draw inferences from mixed methods and integrate qualitative insights into decision-making frameworks. • Joined a dedicated session on advanced data analysis, emphasizing triangulation of qualitative and quantitative data, synthesis of coded data, and interpretation of complex thematic matrices.
Linking theory (Classroom learning) with practice at your organisation	• Used theoretical understanding of qualitative reporting to structure and compile thematic summaries. • Applied SAS commands and analysis techniques learned in class to real-world datasets under supervision. • Leveraged Excel functions related to date-time formatting and blank management to prepare datasets for final analysis. • Reinforced knowledge of research design and interpretation through guided sessions on advanced data triangulation.
Gaps identified on the working area.	• Limited availability of structured templates for thematic summary writing created variation in reporting formats. • Data inconsistencies in field files (e.g., inconsistent date formats) required significant manual cleaning effort.

	• Lack of clarity in some coded entries highlighted need for standard definitions across data coders.
Suggestions for improvement	• Develop and circulate standard reporting templates for summarizing qualitative findings across teams. • Conduct inter-coder agreement checks more frequently during qualitative analysis phases.
Plan for the next week	• Complete literature review for the topic and start forming a research question. • Continue with remaining SAS modules and finalize Excel datasets. • Attend peer review sessions to gather feedback on FGD and SOGI-based findings.

Reporting Week-6

Name of the Organisation: Piramal Swasthya, Patna

Area/ Department/ Project of Summer Internship Program: Research, Monitoring, Learning & Evaluation (RMLE) Department

Name of the Student: Raman John Shrivastava

Roll no: 2046

Stream: HM 29

Week no: 6

From: 16/06/25 to 21/06/25

Activity Done	• Initiated comparative analysis of existing data collection tools and digital health competencies used in other published studies with tools and competencies currently applied within the organisation. • Reviewed improvised tools and several internal reports to identify gaps and areas for enhancement in alignment with the best practices found in literature and similar program evaluations. • Participated in team meetings focused on the format and structure of the final internship report. Discussed reporting expectations, formatting guidelines, and timelines for submission. • Attended advanced data analytics sessions on SAS software. Gained exposure to practical functions relevant to health data including cross-tabulation, output interpretation, and reporting insights. • Attended an introductory session on biostatistics, focusing on descriptive statistics and foundational analytical concepts relevant for health data interpretation. • Participated in SAS training on the use of cross-tabulations and their interpretations, reinforcing understanding of variable relationships in survey datasets. • Attended extended sessions on biostatistics covering variable classification, central tendency measures, and hypothesis testing. • Completed practical exercises on data cleaning and management using Excel. Activities included logical sorting, error identification, and format standardization. • Learned and practiced new Excel functions for enhanced data handling, including CONCATENATE, IFS, SUMIFS, TEXT, and other text-processing and conditional aggregation formulas.
Linking theory (Classroom learning) with practice at your organisation	• Applied comparative analysis frameworks from research methods coursework to evaluate existing and external study tools. • Strengthened application of biostatistical concepts introduced in the classroom to real-world datasets during SAS exercises.

	Practiced advanced Excel functions and logical operations taught in class within actual health program datasets. Reinforced concepts of data visualization, tabulation, and statistical inference through continuous practice.
Gaps identified on the working area.	
Suggestions for improvement	
Plan for the next week	- Complete literature review for the topic and start forming a research question. - Begin drafting key sections of the internship report. - Start data analysis for the topic. - Continue with remaining SAS modules and finalize Excel datasets. Continue advanced SAS training focusing on inferential statistics.

Reporting Week-7

Name of the Organisation: PIRAMAL SWASTHYA, PATNA

Area/ Department/ Project of Summer Internship Program: Research, Monitoring, Learning & Evaluation (RMLE) Department

Name of the Student: Raman John Shrivastava

Roll no: 2046

Stream: HM 29

Week no: 7

From: 23/06/25 to 28/06/25

Activity Done	• Attended advanced training sessions on SAS focused on analytical procedures, including recoding variables and interpreting descriptive statistics. • Participated in a detailed session on the calculation and interpretation of the Wealth Index, which is commonly used to stratify populations in public health studies. • Created and reviewed comparative tables to analyse key indicators from Sample Registration System (SRS) data of Bihar for the years 2018 and 2022. These indicators were used to contextualize health system progress over time. • Attended biostatistics sessions focusing on concepts such as descriptive statistics, control and confounding variables, and their role in data interpretation. • Participated in a session on hypothesis formulation in biostatistics, learning how to frame testable research questions using null and alternative hypotheses. • Engaged in a training workshop on the “Compassionate Leadership” tool and were briefed on the methodology, objectives, and application in the healthcare context. • Attended an Excel training session that involved assignments using basic formulas and all data cleaning and management techniques covered to date, including CONCATENATE, IFs, SUMIFs, and logical functions. • Conducted field visits to collect primary data for the “Compassionate Leadership” study in the public health setting. • Interacted with key healthcare stakeholders including Medical Officers In-Charge (MOIC), Auxiliary Nurse Midwives (ANMs), Health Managers, Nurses, and other facility-level personnel. Fieldwork was carried out in Fatuha and Khusrupur blocks of Patna district, providing ground-level insights on leadership attitudes, facility functionality, and team dynamics within the rural health system.
---------------	---

Linking theory (Classroom learning) with practice at your organisation	• Applied theoretical knowledge of biostatistics including descriptive statistics and hypothesis formulation in field-based analytical planning. • Utilized SAS training to process real datasets and perform recoding and stratification of variables for analysis. • Integrated concepts of public health indicators from classroom into comparative analysis using SRS data. • Practiced Excel-based data management approaches to organize and clean datasets gathered from field visits.
Gaps identified on the working area.	• Inconsistent documentation of key performance indicators at facility level leading to data gaps. • Variability in understanding of leadership roles and responsibilities among field-level healthcare workers. • Unmatched roles-based questions with overlapping and confusing scenarios identified in tools for ANMs and Staff Nurses.
Suggestions for improvement	• Recommend structured training programs on data documentation and indicator tracking for facility staff. • Suggest implementing orientation modules on compassionate leadership for all healthcare cadres to promote uniform understanding. • Advocate for pilot adoption of digital leadership assessment tools for ongoing monitoring and improvement.
Plan for the next week	• More field visits for the on-going study on “Compassionate Leadership” in the remaining blocks and analysis. • Analyse and synthesise data collected from the field visits for the Compassionate Leadership study. • Continue advanced SAS sessions focusing on inferential statistics and regression analysis. • Prepare a brief report summarizing findings from SRS comparisons and their implications. • Attend further biostatistics and Excel training and apply lessons to internship deliverables. • Initiate drafting of the final internship report with a focus on thematic insights and recommendations.

Reporting Week-8

Name of the Organisation: Piramal Swasthya, Patna

Area/ Department/ Project of Summer Internship Program: Research, Monitoring, Learning & Evaluation (RMLE) Department

Name of the Student: Raman John Shrivastava

Roll no: 2046

Stream: HM 29

Week no: 8

From: 30/06/25 to 5/07/25

Activity Done	• Participated actively in the data collection drive for the ongoing study on “Compassionate Leadership” in the public health system. • Visited five blocks across Patna district to conduct structured interviews and gather insights from healthcare personnel. The blocks and facilities visited were: - Dulhinbazar PHC - Fatuwah CHC - Khusrupur PHC - Pandarak PHC - Mokama Referral Hospital • Conducted field-level discussions and interviews with various stakeholders including Medical Officer In-Charge (MOICs), General Nurse Midwives (GNMs), Auxiliary Nurse Midwives (ANMs), Pharmacists, Drug Storekeepers, Lab Technicians, Block Health Managers, and Accounts Managers. • Facilitated and documented the collection of qualitative and quantitative insights regarding leadership practices, team collaboration, facility operations, and staff perspectives. • Attended a session on Excel data cleaning and management. Practiced data standardization techniques and logical data correction to prepare datasets for analysis.
Linking theory (Classroom learning) with practice at your organisation	• Applied public health fieldwork methodologies and stakeholder engagement techniques learned in coursework during primary data collection. • Practiced interview techniques aligned with research ethics and qualitative data capture guidelines. • Reinforced Excel skills previously taught in class through application to field-generated datasets. • Connected leadership and health management theories to real-life facility dynamics and human resource interactions.

Gaps identified on the working area.	• Inconsistent understanding among facility-level staff about the concept of compassionate leadership. • Variability in leadership effectiveness and communication practices across visited blocks. • Limited presence of standardized tools for assessing leadership indicators at the facility level.
Suggestions for improvement	• Recommend conducting awareness and sensitization sessions for block-level staff on compassionate leadership principles. • Develop uniform assessment tools for tracking leadership performance and engagement outcomes. • Suggest periodic review and peer sharing sessions across blocks to promote cross-learning and leadership best practices.
Plan for the next week	• Begin analysis of both quantitative and qualitative data collected from field visits. • Continue refining Excel datasets and begin preliminary analysis of findings. • Participate in scheduled SAS and biostatistics training sessions. • Draft initial outline for final internship report including field study narratives and observations.

Reporting Week-9

Name of the Organisation: Piramal Swasthya, Patna

Area/ Department/ Project of Summer Internship Program: Research, Monitoring, Learning & Evaluation (RMLE) Department

Name of the Student: Raman John Shrivastava

Roll no: 2046

Stream: HM 29

Week no: 9

From: 07/07/25 to 12/07/25

Activity Done	• Participated in internal meetings related to the initiation of a new study. Received detailed briefing on the study's objectives, methodology, and the plan for tool development. • Studied supplementary materials and dictionaries related to the tool under development. Reviewed structure and content to support evidence-based design. • Attended a session on advanced analytics covering statistical methods including t-tests and independent t-tests. • Contributed to the tool development process for the "Compassionate Mindset in Nurses" study. Assisted in designing scenario-based questions and structured level-based quantitative response options. • Attended a biostatistics session focused on data normality, selection of parametric vs. non-parametric tests, and transformation techniques to meet test assumptions. • Observed and participated in real-time tool development activities and collaborative discussions regarding framing items for psychometric validation. • Prepared a field report based on previous field visits related to the Compassionate Leadership study, summarizing observations and interactions with healthcare personnel. • Initiated work on individual study project on "Digital Competency." Received relevant dataset and began familiarizing with its structure and variables. • Created a preliminary codebook for the digital competency dataset. Outlined variable names, definitions, labels, and coding schemes. • Attended a session on SAS focusing on the construction of wealth index. Learned procedures including variable recoding, use of log scale transformations, and formation of tertile scales. • Participated in a basic Excel training session on data cleaning and management. Practiced exercises involving filtering, sorting, conditional functions, and error handling.
----------------------	---

Linking theory (Classroom learning) with practice at your organisation	• Applied Organisation Behaviour and Principles of Management concepts to develop assessment tools related to nurse leadership and compassion. • Reinforced theoretical knowledge of inferential statistics by applying t-tests in health data analytics. • Utilized classroom concepts from digital health and data governance to begin analysing real-world competency data.
Gaps identified on the working area.	• Need for further clarity on establishing inter-rater reliability during scenario-based question development. • Inconsistent data formatting in digital competency datasets requiring thorough pre-processing. • Limited documentation for certain variables which made initial interpretation of the dataset more challenging.
Suggestions for improvement	• Recommend incorporating expert review and pilot testing for the compassionate mindset tool to ensure relevance and clarity. • Suggest standardizing all variable definitions in the dataset and updating the codebook accordingly. • Encourage integration of field feedback into iterative improvements in tool structure and content.
Plan for the next week	• Begin thematic and descriptive analysis of digital competency data. • Finalize the draft tool for compassionate mindset study and prepare for pilot testing. • Continue with SAS training and begin practicing logistic regression techniques. • Attend review meeting for progress update on individual project and finalize first analytical output. • Refine field report with feedback and integrate with overall internship deliverables.

Reporting Week-10

Name of the Organisation: Piramal Swasthya, Patna

Area/ Department/ Project of Summer Internship Program: Research, Monitoring, Learning & Evaluation (RMLE) Department

Name of the Student: Raman John Shrivastava

Roll no: 2046

Stream: HM 29

Week no: 10

From: 14/07/25 to 19/07/25

Activity Done	• Attended meetings regarding tool development for the Compassionate Mindset in Nurses study. Discussed corrections in domain definitions, pro-domains, and response options. • Contributed to revision of the tool structure. Developed new scenarios and level-based options to improve contextual relevance and clarity. • Suggested modifications and helped frame definitions for specific sub-domains during tool development discussions • Continued analysis of the individual project on digital competencies. • Focused on initial understanding of the dataset, cleaning, and preparation for analysis. • Attended a session on biostatistics focusing on data normality and its interpretation using SAS. Applied learnings to assess assumptions for statistical tests. • Participated in SAS session on application of t-tests in healthcare data, further reinforcing practical understanding of statistical hypothesis testing. • Practiced data analysis in SAS for the digital competency project. Performed recoding and categorization of variables using newly learned SAS functions. • Created descriptive tables for summarizing key variables and started stratified analysis to explore subgroup differences in digital competencies. • Attended an additional SAS session on the use of recoding and data categorization functions. Continued studying and refining the dataset for interpretation. • Maintained progress in scenario design and tool development tasks alongside individual data analysis work.
Linking theory (Classroom learning) with practice at your organisation	• Translated behavioural science theory into structured tool components including domain definitions and scenario-based questions. • Applied biostatistical concepts such as normality testing and t-tests to live datasets within SAS.

	Designed descriptive and stratified tables in line with data presentation standards taught in analytics and epidemiology modules.
Gaps identified on the working area.	- Some ambiguity persisted in mapping field-based behavioural scenarios to structured psychometric domains. - Minor inconsistencies identified during recoding process that required further verification. - Stratified analysis required more contextual benchmarks to interpret results meaningfully.
Suggestions for improvement	- Recommend expert validation of revised tool components prior to finalization for pilot use - Incorporate more peer-reviewed references to support selection of variables and interpretation of subgroup comparisons.
Plan for the next week	- Finalize all revised scenarios and definitions in the Compassionate Mindset tool. - Complete descriptive and stratified analysis for digital competency project. - Prepare data visualization and interpretation summaries for project findings. - Begin drafting the final internship report including results from Compassionate Leadership and Digital Competency studies. - Participate in final peer review and faculty feedback sessions before submission.

Compiled Report

Name of the Organisation: Piramal Swasthya, Patna

Area/ Department/ Project of Summer Internship Program: Research, Monitoring, Learning & Evaluation (RMLE) Department

Name of the Student: Raman John Shrivastava

Roll no: 2046

Stream: HM 29

Activity Done	• ORIENTATION ○ Attended an introductory session that familiarized us with the Piramal Foundation's mission, core values, and ongoing public health initiatives. ○ Gained insights from an address by Dr. Tanmay Mahapatra (Director), who outlined the vision of the foundation and the goals of the internship, emphasizing the integration of theory and field exposure. ○ Received a comprehensive briefing on our roles and responsibilities, particularly focusing on secondary research assignments related to public health themes. ○ We were each assigned a specific public health topic to work on throughout the internship duration. ○ Mentorship structure was introduced- each intern was paired with an expert mentor for continuous support; I was assigned to Dr. Devashish Singh, who provided academic, operational and functional guidance for my research topic as well as on internship in-general. I also had Dr. Shuchi Sree Akhouri who provided me academic and functional guidance for different fields and projects I was associated with, tasks at hand, academics and normal day to day functioning. • RESEARCH METHODOLOGY SESSIONS ○ Attended both theoretical and applied sessions on research design and methodological principles tailored to public health systems research. ○ Gained clarity on the identification of research problems, including framing
---------------	---

	relevant and researchable issues within the public health context. ○ Learned how to develop research objectives and formulate hypotheses, aligning them with overarching study goals. ○ Explored quantitative, qualitative, and mixed methods approaches, understanding when and how to apply each based on research context. ○ Studied the principles of sampling, covering sampling types, sample size estimation, and representation in population-based studies. ○ Gained practical exposure to public health tool design, with a special focus on- validity and reliability, Tool pre-testing, pilot testing ○ Explored and compared observational vs. experimental study designs, including RCTs and quasi-experiments. ○ Discussed randomization techniques, controlling for confounding factors, and establishing causal inference. ○ Learned about common biases in public health research such as selection, measurement, and recall bias-along with strategies to mitigate them. ○ Covered advanced topics like temporal ambiguity, biological plausibility, and the ecological fallacy. ○ Calculated incidence and prevalence rates, crucial for disease burden assessment and strategic planning in public health. ○ Participated in detailed discussions on research ethics with focus on- ethical clearance, informed consent, and culturally appropriate engagement methods. ● SAS SESSIONS ○ Attended structured sessions focused on the theoretical foundations and practical applications of SAS in public health data analysis. ○ Gained familiarity with the SAS interface and navigation tools and understood coding strategies for importing, manipulating, and
--	---

	cleaning data, forming the base of any analysis. ○ Applied PROC- ▪ MEANS to compute key descriptive statistics such as: N, Sum, Mean, Median, Mode, Min, Max. ▪ UNIVARIATE for a deeper distributional analysis and detection of outliers and skewness ▪ Learned PROC FREQ to create frequency tables for categorical variables, useful for demographic and categorical health data breakdowns. ○ Data Display- PROC PRINT and PROC CONTENTS ○ DATA Step Operations: APPEND, MERGE, DELETE and DROP and Creating NEW VARIABLES, IF-THEN/IF-THEN-ELSE logic. ○ Others: Learned about calculating wealth index, tertiles, recoding, scoring, Cross Tabulation and its interpretation and use, log transformation to normalize skewed variables, Codebook Creation and Syntax Documentation, etc. • ADVANCED ANALYTICS SESSIONS ○ Learned about the biostatistics concepts and its use and interpretations using SAS software. ○ Application of T-Test and Independent T-Test ○ Building Descriptive Tables and Comparative Summaries ○ Learned about Regression Analysis Concepts and Application: ▪ Simple linear regression ▪ Multiple linear regression ▪ Logistic regression ▪ Build regression models in SAS (PROC REG for linear, PROC LOGISTIC for binary outcomes). ▪ Interpret coefficients, odds ratios, p-values.
--	---

	• BIOSTATISTICS SESSIONS ○ Understood the basic concepts of types of variables: nominal, ordinal, interval, and ratio, and their implications for statistical test selection and data interpretation in public health research. ○ Learned about measures of central tendency (mean, median, mode) and measures of dispersion (range, variance, standard deviation), and how they are used to summarize health-related datasets such as haemoglobin levels, digital competency scores, and programmatic indicators. ○ Gained conceptual clarity on the normal distribution and its role in determining the applicability of parametric tests. Recognized the importance of data normality in guiding test selection and ensuring valid conclusions ○ Practiced testing for normality using both visual tools (histograms, Q-Q plots) and statistical tests like the Shapiro-Wilk and Kolmogorov-Smirnov tests. Learned how to interpret skewness, kurtosis, and p-values in this context ○ Explored the difference between parametric and non-parametric tests and understood when each type of test should be applied depending on the distribution of the data and sample size. ○ Studied and applied t-tests to compare means across groups, particularly using independent t-tests for unrelated samples (e.g., comparing male vs. female digital competency) and paired t-tests when observations are related. ○ Learned the concept of hypothesis testing, including formulation of null and alternative hypotheses, understanding type I and type II errors, significance levels (alpha), and interpreting p-values and confidence intervals. ○ Understood the concept and impact of confounding variables in biostatistics, and discussed approaches to control confounding
--	---

	through stratification, restriction, and statistical adjustment. • DATA CLEANING AND MANAGEMENT ON EXCEL SESSIONS ○ Learned the step-by-step process of preparing raw data for analysis: identifying inconsistencies, missing values, blanks, incorrect formats, and duplicate entries. ○ Practiced identifying and removing duplicate rows using- Remove Duplicates feature under the Data tab, formulas such as COUNTIF () to flag repetitions. ○ Used filters and conditional formatting to identify and isolate missing data, implemented IF(ISBLANK(...)) formulas to replace blank cells with default values or flags. ○ Applied conditional logic using: IF, IFS, SUMIF, SUMIFS, etc. ○ Worked with survey data requiring cleaning of names, responses, and coded variables using: TEXT (), CONCATENATE () / TEXTJOIN (), LEFT (), RIGHT (), MID (), LEN () ○ Learned about Date-Time management- Used functions such as TODAY (), NOW (), and date difference calculations (=DATEDIF) to derive duration-based variables ○ Use of Filter, Sort, and Conditional Formatting. ○ Learned advanced summary functions such as: SUMIF () / SUMIFS (), COUNTIF () / COUNTIFS (), AVERAGEIF () ○ Others: Autofill, Freezing Panes, and Data Structuring, practical Assignments and Hands-on Exercises • OTHER SESSIONS ○ Understood the concept of High-Risk Pregnancy, defined as pregnancies with increased risk of complications due to factors such as: ▪ Very young or advanced maternal age
--	--

	▪ Severe anaemia (low haemoglobin levels) ▪ Hypertension during pregnancy ▪ History of medical or obstetric complications. ○ Learned about BEmONC (Basic Emergency Obstetric and Newborn Care) and CEmONC (Comprehensive Emergency Obstetric and Newborn Care) services ○ Studied the IPHS (Indian Public Health Standards) Guidelines 2022, IYCF (Infant and Young Child Feeding) Guidelines, RMNCH+A 5x5 Matrix, MNH Toolkit, VHSND Guidelines, ABDM Guidelines. ○ Iron and Folic Acid Supplementations and the new implementation of Iron Sucrose and Ferric Carboxylic Maltose, Calcium supplements. ○ Family planning and Contraception methods • INVOLVEMENT IN PROJECTS ○ Qualitative study on SOGI (Sexual Orientation and Gender Identity) in the state of Rajasthan and Bihar. ▪ Translation and Transcription of in-depth interview and FGDs of community males, females, SHG Leaders, Government officials. ▪ Data Labelling. ▪ Thematic Extraction and Colour Coding. ▪ Report on thematic analysis ○ Study on Compassionate Care of Leadership ▪ Was part of the field data collection team across 5 blocks: Dulhinbazar, Fatuha, Khusrupur, Pandarak, and Mokama. ▪ Conducted interviews and interactions with- MOICs, ANMs, GNMs, Pharmacists, Lab Technicians, Block Health and Account Managers in PHCs, CHCs and Referral Hospital.
--	---

	▪ Observed FLW behaviour, work culture, and leadership traits in real public health settings. ▪ Created summary report of the Field Visit. ▪ Contributed by giving feedback for refining tools and field visit checklists. ○ Study on Nursing Competency Coding (Specifically on Area- Building Resilience) ▪ Helped in developing and refining scenario-based questions for competency of Self-Compassion and Self-Awareness. ▪ Drafted level-based options linked to behavioural sub-competencies according to the definitions. ▪ Suggested changes to definitions and scenarios after peer discussions ▪ Observed and Contributed to real-time tool development and designing through feedback loops ▪ Ensured the realism and flow of scenarios that were suitable for field level nurse setting in Bihar public health facilities. ○ Digital Competency of FLWs (Particularly CHOs) and Its Role in Health System Strengthening. ▪ Secondary Data Analysis of CHO digital health competency dataset. ▪ Understood the tool structure and devised scoring system across domains (C1 to C7) ▪ Carried out data cleaning, variable transformation, and recoding (binary, tertile, reverse coding) using SAS ▪ Created descriptive statistics ▪ Completed the result table and visual representation of the result and findings for interpretation reporting and discussion.
--	--

	• Field Visits ○ Observed VHSND in Dulhinbazaar block of Patna ▪ Witnessed real-time service delivery by ANMs and ASHAs at the Anganwadi Centre. ▪ Observed routine immunization, nutrition counselling, and maternal care activities. ▪ Learned about FLWs' use of digital tools like M-ASHA, ASHWIN, U-WIN, etc. ▪ Identified service gaps such as: Lack and improper counselling about KMC (Kangaroo Mother Care) and HRP cases, incomplete instructions to mothers, low awareness about Godbharai ceremonies due to cultural beliefs like (nazar lagna). ▪ Prepared an observation report of the visit. ○ Observed Data Collection, Listing and Sampling for Household Survey for Bihar Technical Support Program. ▪ Observed listing and data collection among mothers of children aged 0–23 months (divided into age brackets: 0–5, 6–11, 12–23 months). ▪ Reviewed the survey tool for clarity, sequencing, and cultural relevance. ▪ Identified a major gap: lack of digital aids used by FLWs for health education. (During informal interaction with the residents) • OTHER ACTIVITIES- ○ Created and reviewed comparative tables to analyse key indicators from Sample Registration System (SRS) data of Bihar for the years 2018 and 2022. These indicators were used to contextualize health system progress over time. ○ Studied materials provided from the organisation including the digital tools being
--	--

	utilised by FLWs, materials related to the other projects, etc.
Linking theory (Classroom learning) with practice at your organisation	• Applied knowledge from the concepts of Research Methodology like study design, tool development, sampling, ethics (informed consent), data collection methods (qualitative and quantitative), literature review and finding and presenting findings, etc. • Applied theoretical knowledge about the various health programs with special focus on RMNCHA+N program and various guidelines stated or studied in the classroom sessions of National Health Policy, Health Policy to real world field visits and in projects. • Utilised the concepts from Biostatistics to analyse results to calculate the Digital Health Competency of CHO for my project. Also, it was relatable during the sessions conducted during the internship. • Utilised the concepts from demography to relate, find and make the comparison table, of the key indicators from SRS Report 2018 and 2022. • Applied the theoretical knowledge of digital health from classroom learning practically to my project on Digital Health Competency of CHOs and ABDM understanding. • Applied the concepts learnt during organisation behaviour to develop the tool for Study on Nursing Competency Coding (Specifically on Area- Building Resilience) and also identified the gaps in the tools utilized for Study on Compassionate Care of Leadership.
Gaps identified on the working area.	• During Field Visits- ○ VHSND Observation- Lack and improper counselling about KMC (Kangaroo Mother Care) and HRP cases, incomplete instructions to mothers, low awareness about Godbharai ceremonies due to cultural beliefs like (nazar lagna), Lack of urgency in handling high-risk maternal health cases (e.g., severe anaemia not escalated).

	○ Household Survey Observation- lack of digital aids used by FLWs for health education. (During informal interaction with the residents) • In Projects- ○ SOGI- Interview data presented variation in quality due to inconsistent probing during data collection, manual transcription proved time-consuming and may benefit from semi-automated tools, lack of a centralized framework for coding across team members may lead to interpretive variability in theme extraction. ○ Compassionate Care Of Leadership- The tool lacked depth in each domain and co-domain. ○ Study on Nursing Competency Coding- The definitions of the domains and the codomains along with the options in which the scenarios and the options were to be developed were overlapping, creating confusion among the team during designing the scenarios. ○ Digital Competency of CHO- The designing and structuring of the tool was complicated that posed difficulty and time consuming in analysing the data, reverse coded and multi-option MCQs created confusion, the tool also lacked depth and number of questions in sub-competency level making it difficult to assess sub-competencies, competencies levels and overall competency.
Suggestions for improvement	• Provide simple, picture-based counselling guides for ASHAs and ANMs. • Provide IEC material like short videos and picture messages to ANMs and ASHAs for helping them counsel the mothers. • Use short health education videos or WhatsApp content to support FLWs • Create basic coding guide before initiating any qualitative analysis. • Use AI based software for transcription and translation process reducing manual labour. • For the compassion and related studies, in-depth and brief session on the concepts from Organisation

	Behaviour can be incorporated before initialising tool development. • Organize regular digital training sessions for FLWs on government apps. • Increase the training sessions of FLWs to orient them to the digital apps and the processes involved. • Keep on rectifying the identified gaps.
Key Learnings	• Exposure to office environment, team dynamics and working, coordination and interaction. • Witnessing ground realities of public health- understood and identified the challenges faced by FLWs and other staffs of the facilities, observed gaps in service delivery, counselling, cultural barriers, social barriers, etc. • Experienced tool development hands-on and learnt the steps involved in this. • Exposure to communication- interacted with MOICs, ANMs, ASHAs, AWWs and other public health staffs and also collaborated with Senior researchers, Mentors, Seniors and Colleagues. • Experienced hands-on analytics (both qualitative and quantitative) in both software and manual way.

Project- Digital Health Competency of CHOs of Bihar and Its Role in Health System Strengthening

- **Introduction**

Digital transformation is rapidly shaping the global healthcare and in LMICs like India, initiatives like Ayushman Bharat Digital Health Mission (ABDM) are the main driving force for creating and providing this platform. Integrating digital tools- from Electronic Health Records to Telemedicine to Mobile Applications- greatly improves the service delivery, data collection and management, analysis and hence the evidence-based decision making. Researches show that utilising digital health benefits patients, reduces costs, and enhances efficiency, especially in LMICs like ours.

Community Health Officers (CHOs), vital to **Ayushman Bharat - Health and Wellness Centres (AB-HWCs)**, are particularly critical between healthcare and communities and especially in remote areas. They are responsible for delivering primary care, implement national programs and collect health data. As India's healthcare system is moving towards digital transformation, CHOs' digital health competency becomes paramount for success. A digitally competent CHO streamlines tasks, improve patient care, and build a stronger, more responsive health system. Evidence shows digitally skilled frontline workers are more

effective in data reporting for national programs, disease surveillance, and community engagement via platforms like the E-Sanjeevni, ABHA app. Conversely, a lack of digital skills can hinder digital health initiatives, leading to inefficiencies and undermining health system strengthening. Research shows that insufficient digital literacy can lead to underutilisation of tools, erroneous data collection and analysis ultimately leading to decreased accuracy and hinder in policy making and implementation. This project assesses CHOs' digital competency in Bihar, India and explores how their skills can fortify the public health system.

- **Objectives**

The primary objectives of this study are

- To measure the overall digital health competency of CHOs across various domains as defined by the dictionary of Digital Health Competency Building (DHCB) framework that is being utilised by the UP and Bihar TSUs.
- To infer the implications of assessed competencies on broader health system strengthening.

- **Research Methodology**

- Study Design- This is the secondary data analysis of quantitative, cross-sectional study design to assess the CHOs' digital competencies.
- Study Area- The data was collected across the 45 blocks across 13 districts, ensuring representation from all 9 administrative divisions of Bihar.
- Study Sample- A total of 275 CHOs from the Health and Wellness Centres across Bihar, India.
- Data Collection Procedure- This study involved secondary data collection, meaning the original data was accessed and utilised. The original data was collected by Piramal Swasthya, Patna, Bihar. For this secondary data analysis, appropriate permissions were obtained to use the dataset.
- Data Analysis- Descriptive Statistics were utilised
 - Frequencies and Percentages: Used to describe sociodemographic characteristics and responses to skill-based and knowledge-based questions.
 - Mean, Median, Mode, Standard Deviation, Minimum, and Maximum: Used to summarize continuous variables such as age, course duration, and experience.
 - Mean, Minimum, and Maximum Scores: Calculated for each digital competency domain (C1, C2, C3, C5, C7) and for overall digital health competency, expressed on the scale of 100.
 - Lower Confidence Interval (LCI) and Upper Confidence Interval (UCI): Provided for percentage values to indicate the precision of the estimates.

- **Result**

Variable	Description	N	Mean	Minimum	Maximum
c1_score_p_100	C1- Using digital devices and applications	275	84.36	0.00	100.00
c2_score_p_100	C2- Data collection and management using digital devices	275	73.53	20.00	100.00
c3_score_p_100	C3- Data Analysis and Communication	275	81.36	0.00	100.00
c5_score_p_100	C5- Ethics, legal and regulatory considerations including data protection, privacy and consent	275	57.45	0.00	100.00
c7_score_p_100	C7- Introduction to Digital Health	275	54.00	0.00	100.00
Overall_score_p_100	Overall Digital Health Competency	275	75.32	23.53	100

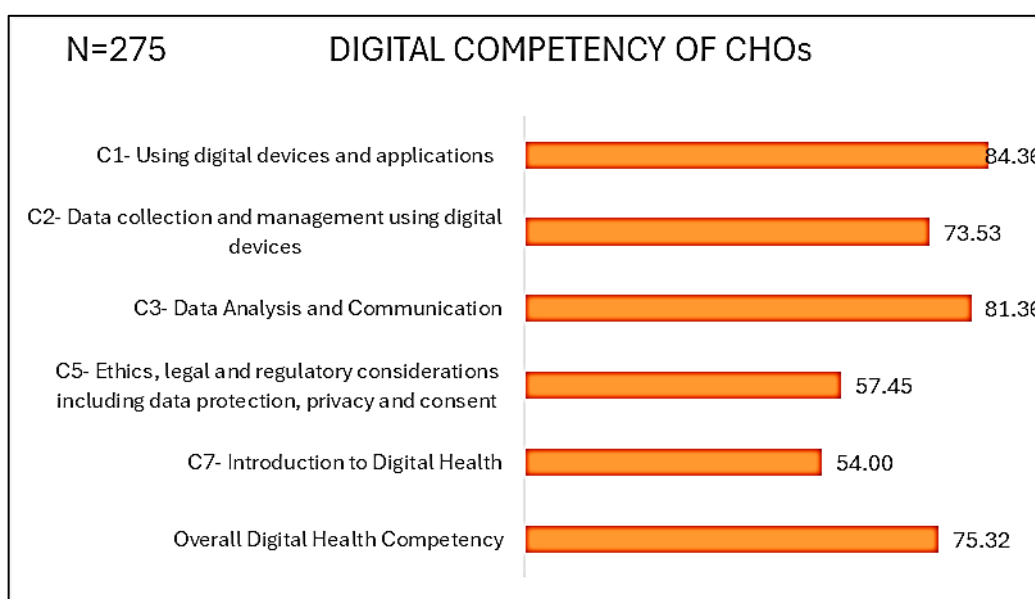


Fig: Graph representing Mean Scores of CHOs: competency wise and overall

- Sociodemographic Details- A total of 275 CHOs participated in the study. The mean age of the participants was approximately 30.03 years. The gender distribution was nearly equal, with 50.55% male and 49.45% female participants. The majority of CHOs (93.82%) identified as Hindu. Regarding educational qualifications, 66.29% held a B.Sc. Nursing degree, while 32.58% had other degrees. A significant proportion (84.09%) had completed a certification course for community health before joining their current role. The average duration of this course was 6.22 months. On average, CHOs had been recruited for the post in HWC for 30.76 months.
- Competency Wise and Overall Scoring-
 - **C1 - Using digital devices and applications: 84.36**
 - **C2 - Data collection and management using digital devices: 73.53**
 - **C3 - Data Analysis and Communication: 81.36**
 - **C5 - Ethics, legal and regulatory considerations including data protection, privacy and consent: 57.45**
 - **C7 - Introduction to Digital Health: 54.00**
 - **Overall Digital Health Competency: 75.32**

The highest competency was observed in "Using digital devices and applications" (84.36%), followed by "Data Analysis and Communication" (81.36%). The lowest scores were in "Introduction to Digital Health" (54.00%) and "Ethics, legal and regulatory considerations including data protection, privacy and consent" (57.45%). The overall average digital health competency was 75.32%.

- **Inference**

- The analysis indicates that CHOs generally possess a decent level of digital competency, reflected in an overall average score of **75.32**. This suggests that CHOs have a good grounding in the use of digital tools, which is essential for their pivotal role in delivering technology-enabled healthcare services.
- When examined across specific competency domains, CHOs performed particularly well in *Using Digital Devices and Applications* (C1), with a better score of **84.36**. This indicates that they are quite confident and comfortable with the basic operation of digital tools-such as mobile phones, health apps, and other digital platforms-which lays a foundation for advanced digital health functions. They also showed notable strength in *Data Analysis and Communication* (C3), scoring **81.36%**, suggesting that they are capable of understanding and using data effectively for simple informed decision-making and communication within the health system.
- Despite these strengths, some important areas emerged where CHOs may need additional support and training. The domain of *Ethics, Legal and Regulatory Considerations-including Data Privacy, and Consent* (C5) scored **57.45%**, while *Introduction to Digital Health* (C7) scored **54.00%**-

both significantly lower than the other domains. These findings point towards a potential gap in their theoretical understanding of the broader digital health ecosystem. While CHOs are proficient in using digital tools, they may not be fully aware of the ethical, legal, and regulatory principles that govern their use-such as data privacy, patient consent, and digital accountability. Strengthening their knowledge in these areas is critical to ensure responsible and secure use of digital technologies in healthcare.

- Another area that could benefit from further reinforcement is *Data Collection and Management using Digital Devices (C2)*, where the score stood at **73.53%**. Although this is relatively decent, it suggests there may be some room for improvement in ensuring consistent data quality, standardisation, and efficient data handling.
- Overall, the findings present a positive picture of CHOs' digital readiness in the measured levels of competencies while also highlighting key areas for capacity building, particularly in the foundational understanding of digital health principles and responsible data practices.

- **Discussion**

- This section delves deeper into what the findings from the analysis means and its incorporation into strengthening the Health System, specifically in Bihar, India. Their demonstrated ability to operate digital devices, manage health data, and communicate information effectively positions them as key enablers in the state's digital health journey.
- Role in Health System Strengthening in Bihar-
 - **Improved Data Accuracy and Timeliness:** Their digital proficiency can help ensure more accurate and up-to-date health data collection from the grassroots level. This, in turn, supports timely and evidence-based planning and interventions across Bihar.
 - **Enhanced Service Delivery:** CHOs are well-placed to support teleconsultations, digital follow-ups, and remote patient monitoring-initiatives that are especially vital in remote and underserved regions of the state where access to healthcare remains a challenge.
 - **Stronger Disease Surveillance:** Their ability to report and communicate health trends digitally can significantly improve the speed and accuracy of disease surveillance, enabling quicker public health responses during outbreaks.
 - **Support for Evidence-Based Decision-Making:** With access to real-time data, CHOs can contribute to informed decision-making at the local level, whether it be for resource allocation, identifying service gaps, or evaluating ongoing health programs.
- However, while these strengths are commendable, the study also reveals important areas where further support is needed. Notably, gaps were observed in domains such as digital health ethics, data privacy, and the

legal and regulatory frameworks that govern digital health systems. This suggests that while CHOs are technically skilled, there remains a need to build their understanding of the broader digital health ecosystem and the responsibilities that come with handling sensitive patient information.

- Also, according to the dictionary by DHCB framework, further levels in the assessed competency domains and the other competency domains that haven't been assessed are to be included for satisfactorily calculating the overall digital health competencies of the CHOs and in general, the frontline workers.
- To truly maximize the impact of digital health initiatives in Bihar, it is essential to address these gaps through targeted capacity-building efforts. Focused training modules that cover data protection laws, ethical considerations, Digital leadership and management, national digital health frameworks such as the Ayushman Bharat Digital Mission, Telehealth, Artificial intelligence & Machine Learning, will be crucial and will open new gates. Importantly, such training should not only teach how to use digital tools but also instil a strong understanding of *why* and *how* of the aforementioned and assessed competencies for strengthening the health system and improve quality of care.
- Empowering CHOs with this holistic digital competency-combining practical skill with deep knowledge-will ensure that they can serve not just as efficient users of technology, but as responsible digital health stewards. This will be a key step toward building a resilient, data-driven, and digitally sound health system for Bihar.

Signature of the Student

Raman John Shrivastava

MBA HM-29

IIHMR University

Approved by the IIHMR University's Mentor