

DISSERTATION

At

U4RAD Technologies PVT LTD.

(24th February 2025- 24th May 2025)

**Identifying Key Operational Challenges in Health Camp Management:
A Study at**

U4RAD XRAI Digital

By

MUDASSHIR KHAN

(PG/23/067)

Hospital Management

Under the Guidance of: Dr. ALTAF YOUSUF MEER.

POST GRADUATE DIPLOMA IN HOSPITAL AND HEALTH MANAGEMENT 23-25



**INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT AND
RESEARCH**

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RESEARCH**



The certificate is awarded to

MUDASSHIR KHAN

In recognition of having successfully completed
his/her Internship in the department of

‘OPERATIONS’

and has successfully completed
his/her Project on

“Identifying Key Operational Challenges in Health Camp Management: A Study at U4RAD XRAI
Digital”

‘24TH FEB TO 24TH MAY 2025’

**‘U4RAD TECHNOLOGIES PVT LTD’.
GURGAON HARYANA.**

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

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

A handwritten signature in black ink, appearing to read 'Kaib'.

Training & Development

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Human Resources





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CERTIFICATE ON PLAGIARISM CHECK



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Course Specialization (Choose one)	Hospital Management ☒	Health Management	Healthcare IT
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Name of the Student: MUDASSHIR KHAN

Name of the Organisation in Which Dissertation Has Been Completed: U4RAD Technologies pvt ltd .

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Identify challenges for smooth operations.

Strengths: Sincere
Disciplined
Focused

Suggestions for Improvement:

To learn and study more case studies for better management of operations.

Suggestions for Institute (course curriculum, industry interaction, placement, alumni):

To include more ~~practical~~ visits for better preparation for job.

Signature of the Officer-in-Charge/ Organisation Mentor (Dissertation)

Certificate from Dissertation Advisory Committee

This is to certify that **Mr./Ms./Dr. MUDASSHIR KHAN**, a graduate student of the **PGDM (Hospital & Health Management)** has worked under our guidance and supervision. He/ She is submitting this dissertation titled "Identifying Key Operational Challenges in Health Camp Management: A Study at U4RAD XRAI Digital" at "YOUR ORGANIZATION" in partial fulfillment of the requirements for the award of the **PGDM (Hospital & Health Management)**.

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.


Dr. Kriti Aggarwal
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Dr. Altaf Yousuf Meer.
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Certificate of Approval

The following dissertation titled **IDENTIFYING KEY OPERATIONAL CHALLENGES IN HEALTH CAMP MANAGEMENT: A STUDY AT U4RAD XRAI DIGITAL at IIHMR Delhi** is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **PGDM (Hospital & Health Management)** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation.

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**INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH,
NEW DELHI**

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **Identifying Key Operational Challenges in Health Camp Management: A Study at U4RAD XRAI Digital** and submitted by **MR.MUDASSHIR KHAN** Enrollment No. **PG/23/067** under the supervision of **DR ALTAF YOUSUF MEER** for award of PGDM (Hospital & Health Management) of the Institute carried out during the period **from 24TH FEB 2025 to 24TH MAY 2025** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

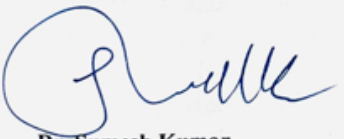

Signature

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. Mudasshir khan** student of Post Graduate Diploma in Hospital and Health Management (PGDHM) from International Institute of Health Management Research, New Delhi has undergone internship training at **U4RAD Technologies LLP** from **24th February 2025 to 24th May 2025.**

The Candidate has successfully carried out the study designated to him during internship training and his/her approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements.
I wish him all success in all his/her future endeavors.



Dr. Sumesh Kumar
Associate Dean, Academic and Student Affairs
IIHMR, New Delhi



Dr. Altaf Yousuf Meer.
Associate Professor / placement Dean
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I extend my words of thanks to all the staff for always being so cooperative and facilitating me. I am extremely grateful to my parents for their love, prayers, caring and sacrifices for educating and preparing us for our future. Finally, my thanks to all the people who have supported me to complete the research work directly or indirectly.

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ABSTRACT

This dissertation titled *"Identifying Key Operational Challenges in Health Camp Management: A Study at U4RAD XRAI Digital"* focuses on understanding and addressing operational inefficiencies in health camps conducted by U4RAD, a healthcare technology company that integrates AI-driven diagnostics with community outreach programs. Preventive health camps play a critical role in providing accessible healthcare services, particularly in underserved urban and semi-urban areas. However, these camps often face challenges such as registration delays, poor communication, uneven staff allocation, equipment breakdowns, and incomplete diagnostic coverage, all of which compromise patient experience and service quality.

The study adopted a mixed-method, descriptive design with both retrospective and prospective analysis of two health camps. Data collection tools included Excel-based operational records, field observation checklists, staff feedback forms, and semi-structured interviews. Findings from the first camp revealed key gaps such as lack of clear patient flow, inadequate signage, absence of a real-time tracking mechanism, crowding at certain service points, and significant shortfalls in pathology testing, where more than half of the patients missed their investigations. These operational shortcomings highlighted the need for structured planning and monitoring systems.

In response, several interventions were introduced in the second camp, including the use of a **Test Requisition Form (TRF)** to track patient services, clear signboards and visual aids for navigation, structured staff deployment with backup personnel, improved patient communication, and availability of standby equipment. These process redesigns led to remarkable improvements—service completion rates increased significantly, patient communication, and availability of standby equipment. These process redesigns led to remarkable improvements—service completion rates increased significantly, patient confusion was minimized, waiting times reduced, and satisfaction levels improved. The comparative analysis between Camp 1 and Camp 2 demonstrated that even modest operational redesigns can substantially improve efficiency, patient experience, and overall service delivery in health camp models.

The study concludes that health camp management requires a synchronized framework of logistics, technology, and human-centric communication. It emphasizes the importance of structured workflows, digital integration, and feedback mechanisms to ensure comprehensive service coverage and patient-centered care. While the study was limited to U4RAD's setting and covered a short duration, its findings provide actionable recommendations and a replicable framework for designing efficient, scalable, and sustainable health camp operations in India.

INTRODUCTION

- ▶ **U4RAD (You For Radiology and Diagnostics) is a pioneering digital healthcare company committed to enhancing diagnostic services through technology-driven solutions. It focuses on improving access, affordability, and efficiency of radiology and preventive health screening services across India.**
- ▶ **The core mission of U4RAD is to bring diagnostic services closer to the people, especially in underserved and semi-urban areas, by organizing health camps and point-of-care diagnostic solutions. Their model combines B2B and B2C partnerships to offer comprehensive health check-up packages, including:**
 - ▶ **Digital X-rays**
 - ▶ **ECG (Electrocardiogram)**
 - ▶ **PFT (Pulmonary Function Test)**
 - ▶ **Blood Tests**
 - ▶ **Vitals**
 - ▶ **Audiometry**
 - ▶ **Physician consultation**
- ▶ **These services are delivered in collaboration with trained healthcare staff, diagnostic technicians, and radiologists. The company uses a tech-enabled ecosystem to manage camp logistics, patient registration, report generation, and delivery through digital platforms.**

U4RAD XRAI Digital is a healthcare technology company that leverages **AI-powered diagnostic tools**, specifically in the domain of **radiology and preventive health screenings**. The company's core mission is to **revolutionize diagnostic imaging and health screening**

processes by integrating cutting-edge AI technologies with on-ground healthcare delivery mechanisms.

U4RAD stands for "**You For Radiology**," reflecting its commitment to empowering both radiologists and healthcare systems with efficient, fast, and scalable solutions. The company operates primarily through:

- **AI-powered diagnostic platforms**
- **Mobile health camp operations**
- **Corporate and institutional health screenings**
- **Remote and underserved area health outreach**

Key Services:

1. Health Camps (B2B and B2C Models):

- Organizes **preventive health check-up camps** at workplaces, educational institutions, and residential societies.

Services include **X-ray, ECG, blood tests, vitals, consultations**, etc.

- Rapid digitization of reports and automated analysis through AI tools.

2. AI-Powered Chest X-Ray Screening:

- Uses AI software to analyze chest X-rays for conditions like **TB, pneumonia, lung nodules, and other thoracic abnormalities**.
- Useful in **mass screenings** and **early disease detection**.
- Reduces dependency on radiologists for primary reporting, especially in rural or high-volume areas.

3. Teleradiology & Digital Reporting:

- Enables remote radiologists to view X-rays, provide second opinions, and finalize reports using cloud-based systems.
- Ensures faster turnaround times (TAT) and efficient case handling.

4. Corporate Wellness Solutions:

- Offers tailored health packages for companies, improving employee wellness and meeting CSR or ESG goals.
 - Delivers end-to-end execution from scheduling, on-site execution, and digital report delivery.
-

Technology Integration:

- **XRAI Platform:** Their proprietary AI platform, trained on lakhs of chest X-ray images, to detect abnormalities with high accuracy.
- **Automated Workflows:** From registration, imaging, data analysis, to report generation—all streamlined.
- **Cloud & Mobile Integration:** Cloud-based report access for doctors and patients; SMS/email-based digital report delivery.

Target Clients:

- **Corporates and Industries**
- **Hospitals and Diagnostics Centers**
- **Government Health Departments (for TB or rural screening)**
- **NGOs and CSR Programs**
- **Public Screening Projects (such as for TB elimination)**

Impact:

- Screened **thousands of patients** across health camps in **urban and semi-urban areas**.
- Helped **reduce diagnostic turnaround time (TAT)** significantly using AI.
- Improved **access to early diagnosis**, especially in resource-poor settings.
- Played a role in supporting the **National TB Elimination Program (NTEP)** through AI-based TB screening.

Organizational Structure:

- **Founders:** Team of professionals from medical, radiology, AI, and operations backgrounds.
- **Teams:** Includes **radiologists, operations managers, health camp coordinators, technical executives, field health workers, and data analysts.**

ROLE & OBSERVATION

I am currently working as an **Operations Executive** at **U4RAD XRAI Digital Healthcare Pvt. Ltd.**, where I actively manage both **on-ground health camp operations** and **backend reporting tasks**. My role involves the complete coordination of preventive health camps, starting from **planning and site arrangements to final execution**.

I handle responsibilities such as **arranging medical and support staff**, ensuring smooth communication among team members, and taking regular follow-ups with camp employees to maintain proper workflow and service quality during camps. I stay engaged throughout the process to make sure that every aspect of the camp runs efficiently and patients receive proper attention.

Apart from managing camp execution, I also work on the **backend**. I use **Excel and specialized healthcare software** to generate, organize, and deliver patient test reports. I ensure that reports are accurate and shared with patients on time, supporting both **efficiency and patient satisfaction**.

My role requires strong **coordination, communication, and problem-solving skills**, and I continuously strive to improve the operational process. I work closely with other departments such as IT, data management, and radiology to ensure that everything runs seamlessly—from patient registration to final report delivery.

Through this experience, I have developed a deep understanding of **health camp logistics, digital reporting systems, and patient engagement**. I am proud to contribute to U4RAD's mission of **providing accessible, AI-enabled diagnostic services** across diverse communities.

SKILLS AND KNOWLEDGE

During my tenure as an **Operations Executive** at **U4RAD XRAI Digital**, I gained valuable skills and practical knowledge that strengthened my understanding of healthcare operations, technology integration, and field management. Some of the key skills and knowledge areas I developed are:

Operational Skills

- **Health Camp Management:** Learned to plan and execute end-to-end preventive health camps, including site preparation, staff arrangement, service flow, and post-camp follow-ups.
- **Coordination and Team Handling:** Developed strong skills in coordinating with cross-functional teams including medical staff, field executives, and support teams to ensure smooth operations.
- **Time Management:** Managed tight schedules and ensured timely delivery of services and reports during high-pressure health camps.

Technical Skills

- **Excel Proficiency:** Gained hands-on experience in using Microsoft Excel for patient data entry, test result compilation, and report generation with accuracy and speed.
- **Healthcare Software Handling:** Learned to work with proprietary software and digital platforms to generate and deliver diagnostic reports efficiently.
- **Report Management:** Understood the full cycle of test data handling—from input to final report sharing with patients via digital channels.

Communication & Soft Skills

- **Stakeholder Communication:** Improved verbal and written communication through regular follow-up with staff, patients, and internal teams.
- **Problem-Solving:** Learned to identify operational challenges quickly and take corrective actions on-site to prevent delays or errors.
- **Customer Service Orientation:** Gained experience in dealing with patients respectfully and providing clear information regarding services and reports.

Healthcare Knowledge

- **Understanding of Diagnostic Workflows:** Built knowledge of different health tests like X-ray, ECG, and blood tests, and how data is processed into final diagnostic reports.
- **Exposure to AI-Driven Healthcare:** Learned how artificial intelligence tools are being used to support radiology and reporting, especially in public health screening like TB detection.
- **Field-Level Public Health Delivery:** Understood the logistics, manpower, and technological support required to run effective healthcare delivery in camp-based setups.

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INTRODUCTION TO PROJECT

In India, preventive health camps play a vital role in bridging the gap between communities and accessible healthcare, especially in underserved regions. These camps offer essential diagnostic services such as blood tests, ECG, X-rays, and physician consultations in an organized, mobile setup. With the growing burden of non-communicable diseases and the need for early detection, health camps have become a practical tool for mass screening and public health intervention. Organizations like **U4RAD XRAI Digital** are pioneering a tech-enabled approach to health camps, aiming to deliver affordable, efficient, and timely diagnostic services through a blend of field operations and digital platforms.

However, while health camps offer a flexible and scalable model of outreach, they are also susceptible to **operational inefficiencies** that can affect service delivery, patient satisfaction, and clinical outcomes. These challenges range from inadequate staff allocation, delayed reporting, and poor communication, to inconsistent test completion rates. In the absence of structured processes, patients often miss critical services, and the intended benefit of these camps is compromised.

Health camp management, unlike static hospital environments, depends heavily on dynamic coordination, timely decision-making, and efficient resource mobilization under constrained timelines and variable conditions. Issues such as **lack of signage, untrained or underprepared staff, absence of tracking systems, or equipment malfunction** not only hinder smooth functioning but also risk the credibility and effectiveness of these outreach models.

A well-organized camp requires more than just logistics—it demands a **synchronized framework** of workflows, digital integration for reporting, and human-centric communication. As seen in the camps conducted by U4RAD, a small gap in planning—such as unclear patient flow or lack of real-time monitoring—can lead to missed tests and patient dissatisfaction. On the other hand, structured interventions such as TRF forms (Test Requisition Forms), clear visual aids, and backup equipment have shown measurable improvements in operational flow and patient experience.

Thus, understanding the **operational challenges in health camp execution** is essential to designing sustainable, quality-driven, and patient-focused outreach programs. This study seeks to examine the real-world issues faced during health camp operations and explore actionable strategies to enhance efficiency, reduce errors, and ensure that every patient receives timely and complete care.

Literature Review

Health camps play a vital role in extending healthcare services to populations with limited access to hospitals and clinics. The WHO India Health Camp Toolkit (2015) emphasizes that successful camps depend on three key elements: thorough pre-camp planning, smooth process flow during the event, and strong post-camp follow-up. Studies in the Indian context highlight recurring operational challenges such as delayed registration, unclear patient pathways, uneven staff deployment, inadequate signage, and inconsistent record-keeping (Patil, Pandey, & Joshi, 2021). These issues often lead to missed services, longer waiting times, and reduced patient satisfaction.

To address such challenges, researchers recommend simple but effective tools like checklists, clearly defined station-wise responsibilities, and patient tracking forms (TRFs) to monitor service completion in real time. Digital technologies, including teleradiology and AI-assisted reporting, have been shown to reduce turnaround times and standardize reporting quality. Such innovations are especially useful in large-scale screening and occupational health camps, where high patient volumes can strain manual processes.

Capacity-building measures, such as staff training, role clarity, and feedback mechanisms, have also been linked to better operational efficiency and improved patient experience (Agarwal et al., 2024). Despite these advancements, gaps remain in the literature, particularly in the use of standardized operational metrics like service completion rates, time-motion analysis, and cost-effectiveness studies. Addressing these gaps would enable a more evidence-based approach to designing and managing health camps, ensuring both efficiency and quality in service delivery.

Objectives of Study

‘To identify key challenges that negatively impact the operational flow of health camp management at U4RAD XRAI Digital

Methodology

Study Setting

Health camps conducted by **U4RAD XRAI Digital** at various urban and semi-urban locations across India. These camps provided preventive diagnostic services using a technology-enabled model.

Camp Type

Camps were conducted under both:

- **B2B model:** For corporate clients and employees
- **B2C model:** For local residents and communities

Study Population

- **Employees involved in camps** (registration staff, technicians, coordinators)
- **Patients attending the camps** for diagnostic services

Study Design

- **Mixed-method, descriptive study**
- Included both **retrospective** (past data review) and **prospective** (real-time observation) components to analyze camp operations

Sampling Method

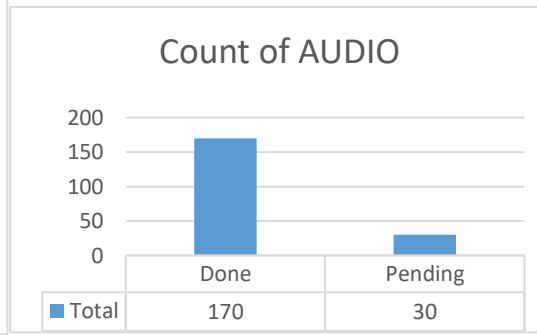
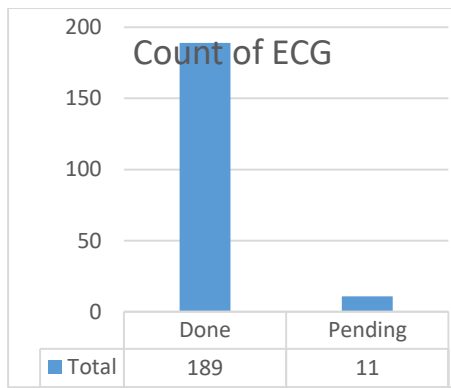
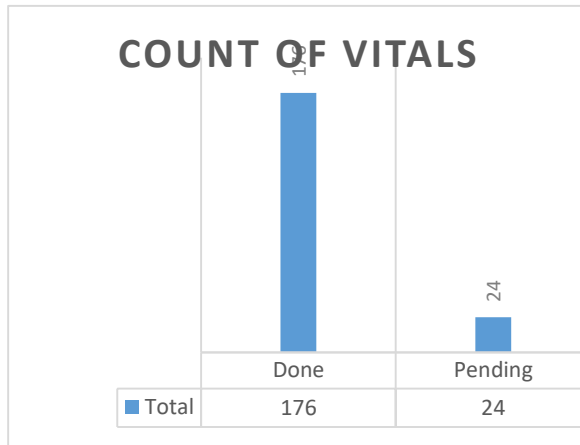
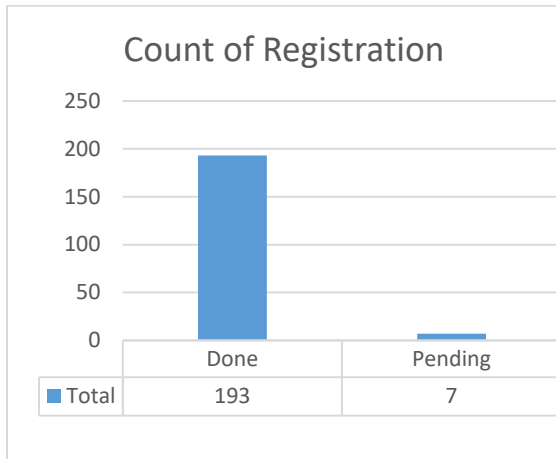
- **Convenience sampling** was used
- Camps were selected based on availability of data and feasibility of observation

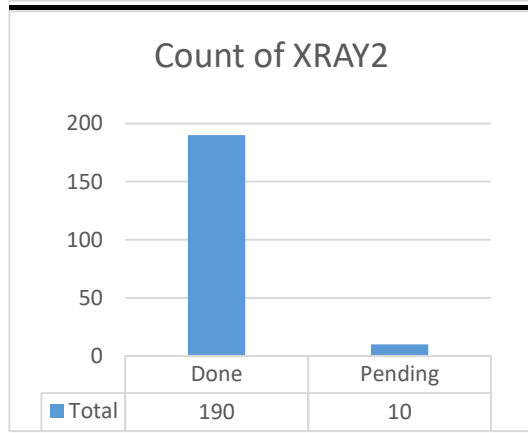
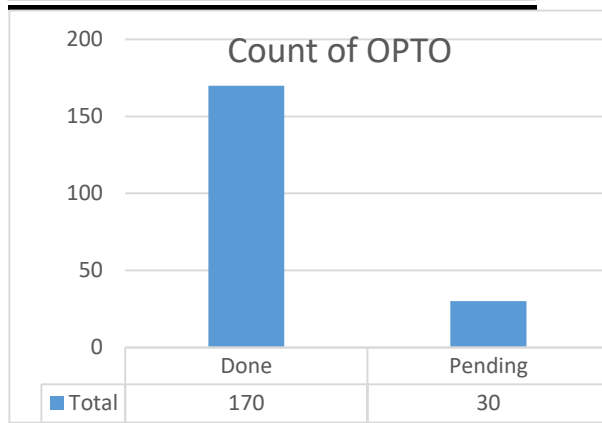
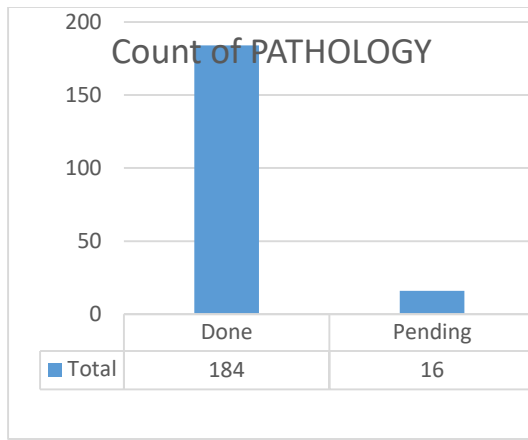
Data Collection Tools

1. **Operational Data Sheets**
 - Excel-based camp records containing patient registration and test details
2. **Field Observation Checklists**
 - Used to observe patient flow, delays in services, and staff coordination during live camps
3. **Semi-Structured Interviews**
 - Conducted with staff to understand their experiences and identify operational challenges
4. **Staff Feedback Forms**
 - Collected feedback on workload, clarity of roles, and difficulties faced during camp execution

DATA ANALYSIS

CAMP 1 –





DISCUSSION

Camp 1: Retrospective Data Analysis

An analysis of patient service completion in Camp 1 was conducted using retrospective data from a total of **200 registered individuals**. The findings reveal both successful service delivery and notable gaps in execution across various diagnostic services.

Out of all attendees, **193 patients completed the registration process**, while **7 remained unregistered**, indicating a fairly high initial compliance rate of 96.5%. A similar trend was observed in the **Pulmonary Function Test (PFT)**, where again **193 individuals underwent the procedure**, leaving 7 pending, possibly due to overlapping delays or patients opting out.

The **X-Ray service** saw slightly reduced coverage, with **190 patients successfully screened** and **10 cases left unaddressed**, reflecting a minor fall in operational efficiency or technical constraints.

A major discrepancy was found in the **Pathology segment**, where only **84 tests were completed**, while **116 cases remained pending**—accounting for over 58% of the camp population. This significant shortfall indicates either logistical inadequacies, supply chain limitations, or miscommunication during patient flow management.

Audiometry tests were completed for **170 participants**, with **30 pending**, suggesting that audiology services were comparatively well-executed, though time or manpower constraints might have contributed to the residual cases.

The **ECG services** recorded **181 completions**, leaving **19 pending**, which is consistent with the general trend of moderate pending cases in technologically driven services. Meanwhile, **Vitals assessment** was carried out for **176 patients**, with **24 cases left incomplete**, hinting at possible crowd flow issues or insufficient coverage in triage areas.

In summary, while most services demonstrated a reasonably high completion rate, **Pathology emerged as a major area of concern**, demanding immediate operational attention. The cumulative pending cases across services point to systemic issues in time management, staffing, or equipment availability, which need to be addressed in future camp planning.

Key Observations and Identified Challenges

During the retrospective review of Camp 1 operations, several critical gaps in coordination and service delivery were identified, impacting the overall efficiency and patient experience.

One of the foremost issues observed was the **lack of effective communication between the camp staff and the patients**. Many individuals reported uncertainty about the sequence of diagnostic procedures, leading to confusion and delays. This confusion was compounded by the **absence of clearly marked signage or visual guidance materials**, such as boards or directional posters, which could have helped patients navigate the testing stations more easily.

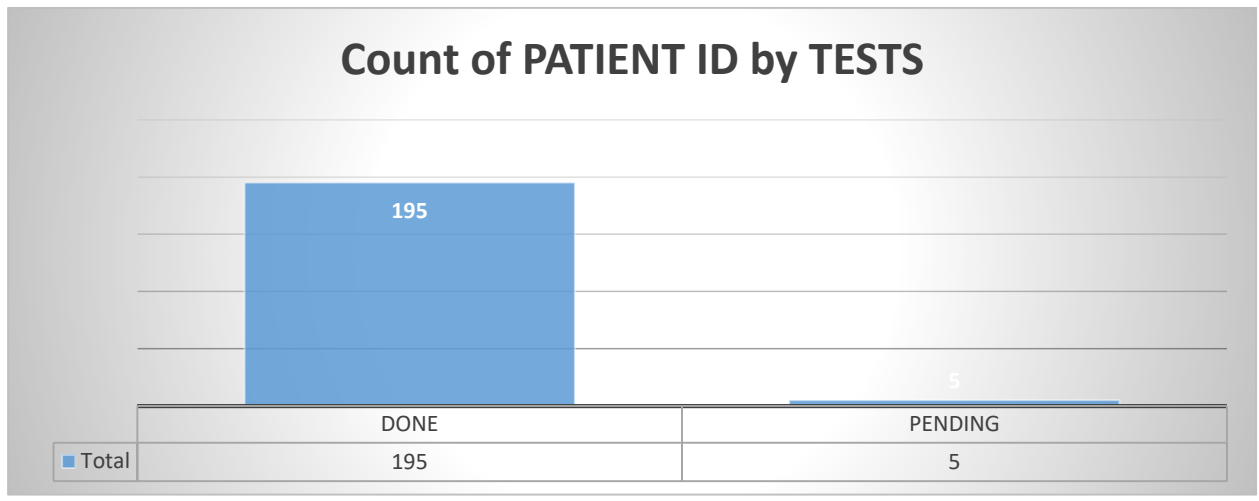
Another significant concern was the **lack of a systematic method to track completed and pending tests**. In the absence of a real-time tracking mechanism, staff members often struggled to verify whether patients had undergone all required investigations. This led to both overlaps and missed services.

Additionally, **certain service points experienced crowding**, while others remained underutilized. This uneven distribution of patients resulted from **poor crowd flow regulation**, leading to long waiting times at specific stations and underperformance at others.

Operational efficiency was further hampered by **equipment-related issues and delayed staff arrivals**, which disrupted the schedule and delayed service delivery. These setbacks not only caused frustration among patients but also led to a backlog in some service areas.

Lastly, it was noted that **some patients missed tests either due to unintentional oversight or by choosing to skip them**. The former was often a result of disorganized queuing and lack of guidance, while the latter pointed to possible gaps in patient counseling or motivation.

These operational shortcomings collectively highlight the need for improved planning, better staff-patient communication, structured process flow mechanisms, and enhanced monitoring tools to ensure comprehensive service coverage in future camps.



Camp 2: Improvements Following Process Redesign

Building on the operational challenges identified during Camp 1, several targeted interventions were introduced in Camp 2 to enhance service delivery and patient experience. These improvements focused on restructuring process flows, strengthening communication, and addressing previous gaps in coordination and resource availability.

A key innovation was the introduction of the **Test Requisition Form (TRF)**. Each patient was issued a TRF at the registration counter, listing all required diagnostic services. As patients moved through various service stations, staff marked each test upon completion. At the end of their visit, patients returned the form to the registration desk for final verification, ensuring that no test was missed or repeated. This not only improved service tracking but also empowered patients to be more aware of their test journey.

To further optimize operations, **staffing was restructured**. Adequate personnel were assigned to each diagnostic area, and **standby staff** were kept ready to fill in for any unexpected absences. This proactive approach helped prevent service delays and ensured that every testing point functioned without disruption.

Efforts were also made to strengthen **communication and patient navigation**. Prominent **signage and directional boards** were placed across the venue, and trained **volunteers** or designated staff members actively guided patients through each step of the process. This measure significantly reduced confusion and enhanced the overall experience.

In addition, a more **structured system for patient movement** was implemented to regulate footfall and avoid overcrowding. Patients were directed in a staggered and organized manner, ensuring smoother transitions between stations and minimizing waiting times.

Another important improvement was the **availability of backup diagnostic equipment**. Extra machines were stationed on-site as a precautionary measure, so that any sudden equipment failure could be addressed immediately without interrupting patient testing.

Outcome of Camp 2

These process enhancements led to measurable improvements. **Nearly all patients were able to complete their full set of tests**, with only a small number of exceptions. Importantly, the few incomplete cases were **attributed to patient decisions** rather than system or staff shortcomings.

Overall, the redesigned process significantly **reduced operational bottlenecks**, enhanced **clarity in patient movement**, and resulted in **higher satisfaction levels among both patients and staff**. The successful implementation of these interventions in Camp 2 provides a replicable framework for future health camps aiming to achieve efficiency and complete service coverage.

RESULT-

The retrospective and comparative analysis of two health camps organized by U4RAD XRAI Digital revealed significant insights into the operational performance, service coverage, and impact of process improvements on health camp outcomes.

Camp 1 Results: Baseline Performance

In Camp 1, a total of **200 patients** were registered for diagnostic screening across multiple services. However, the data indicated various levels of service completion, with several patients missing one or more tests. Notably:

- **Registration and Pulmonary Function Test (PFT)** had a high completion rate of **96.5%** (193 out of 200).
- **X-Ray services** were completed by **190 patients**, leaving **10 pending**.
- **Audiometry and ECG** saw decent uptake, with **170 and 181 completions**, respectively.
- **Vitals assessment** reached **176 patients**, whereas **Pathology testing** saw a major shortfall, with only **84 tests completed**—leaving **116 patients untested**, marking it as the most underperforming service.

The incomplete coverage was largely attributed to communication gaps, absence of visual guides, and a lack of tracking mechanisms to monitor test completion. Operational bottlenecks like overcrowding at certain stations, equipment issues, and inconsistent staff availability further contributed to service disruption. As a result, several patients either unintentionally missed services or opted out due to confusion and delays.

Camp 2 Results: Post-Intervention Outcomes

Following the process redesign, Camp 2 demonstrated a significant improvement in service delivery. Key operational changes—such as the introduction of the **Test Requisition Form (TRF)**, improved **staff deployment**, structured **crowd control**, and proactive **patient guidance**—helped streamline workflow and reduce friction across the service delivery chain.

The results showed that **almost all patients completed their prescribed diagnostic tests**, with only a negligible number of cases left incomplete. Importantly, the few missed tests were the result of **patient choice**, not operational failure. There were no major equipment downtimes reported, and the availability of **backup machines** prevented potential service interruptions.

Feedback from field observations also suggested a clear enhancement in **patient satisfaction**, reduced waiting time, and a better-organized flow of activities. The intervention not only addressed the earlier gaps but also created a replicable model for future camps.

Comparative Summary

Parameter	Camp 1 (Before Intervention)	Camp 2 (After Intervention)
Avg. Test Completion Rate	Moderate to Low	High
Pathology Coverage	42%	Significantly Improved
Missed Tests	Due to Confusion/Delays	Only by Patient Choice
Equipment Issues	Yes	Managed with Backup Devices
Communication & Navigation	Poor	Signboards & Volunteer Support
Tracking Mechanism	Absent	TRF Introduced
Patient Satisfaction	Mixed	Markedly Improved

Limitations:

1. Single-Setting Scope

The study was limited to health camps organized by U4RAD XRAI Digital. As operational practices and resources can differ across organizations, findings may not be fully generalizable to other settings.

2. Short Study Duration

Data collection covered only a three-month period. This short timeframe restricts the ability to assess long-term patterns, seasonal effects, or recurring operational challenges.

3. Limited Variable Analysis

While operational issues were identified, deeper analysis of contributing factors—such as staff experience, patient demographics, or specific environmental conditions—was not performed.

4. Before–After Design Without Control

The redesign was evaluated using a before–after approach without a control group, which may allow other unmeasured variables to influence the results.

5. Narrow Outcome Measures

The study focused mainly on service completion rates and basic turnaround time. Metrics like cost-effectiveness, patient follow-up, or clinical outcomes were not included.

Recommendations

Based on the findings and improvements observed during Camp 2, the following recommendations are proposed for future camps to ensure optimal performance and patient satisfaction:

- **Adopt the TRF (Test Requisition Form)** across all upcoming camps to monitor diagnostic test completion and prevent service gaps.
- **Establish a standardized patient journey**, outlining a clear, logical sequence for tests to be followed by all attendees.
- **Install easily visible signboards and visual aids**, preferably in the local language, to guide patients at every testing point.
- **Ensure the deployment of trained staff** for each service station, with clear task allocations to prevent confusion or overlap.
- **Assign backup personnel** to account for last-minute absences and ensure continuity of services.
- **Conduct a pre-camp orientation or briefing session** with all staff to review roles, responsibilities, and the process flow.
- **Carry reserve equipment**, especially for high-usage or critical diagnostic services, to mitigate the risk of technical failure.
- **Appoint an on-ground operations coordinator** to oversee real-time camp activities and resolve emerging issues promptly.
- **Implement patient feedback mechanisms** at the end of each camp to gather insights and continuously refine operational planning.

These actionable recommendations aim to strengthen the planning and delivery of health camps, ensuring they are not only efficient but also patient-centered and inclusive.

Conclusion

The comparative evaluation of Camp 1 and Camp 2 highlighted how operational design directly influences the efficiency and effectiveness of health camp service delivery. **Camp 1 exposed several structural weaknesses**, primarily stemming from a lack of clear communication, inadequate process visibility, and suboptimal staff and resource allocation. The absence of a well-defined patient journey led to **missed diagnostic tests, confusion among attendees, bottlenecks at service points, and underutilization or overburdening of staff**.

After a thorough assessment of these challenges, strategic interventions were applied in **Camp 2**, including the introduction of a **Test Requisition Form (TRF)** for test tracking, **clear signage** for navigation, **systematic staff deployment**, and the provision of **backup equipment and personnel**. These process enhancements created a more structured environment and improved coordination across all service points.

As a result, **Camp 2 demonstrated a marked improvement** in test completion rates, reduced patient confusion, and significantly enhanced overall operational flow. The successful outcome confirms that **structured planning, efficient resource distribution, and guided patient movement** are fundamental to conducting well-organized and outcome-driven health camps. This study reinforces the idea that even modest operational redesigns, when implemented effectively, can drive substantial improvements in public health outreach efforts.

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