

# **COMPARATIVE ASSESSMENT OF CURRENT INCIDENT REPORTING SYSTEM WITH THE EARLIER LEGACY SYSTEM IN A MULTI-SPECIALITY HOSPITAL**

Dissertation Submitted to



**The IIHMR University, Jaipur**

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Master of Business Administration (MBA)

in

Hospital and Health Management

By

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Under the Supervision and Guidance of

Dr Vinod Kumar SV

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**Certificate of Successful Completion of Internship**

To whomsoever it may concern

**Ms. Meragani Venkata Vasavi Sowjanya** has completed her internship in athmâ, at the Software Development Centre, Narayana Health, Bangalore, in the period of **1<sup>st</sup> April 2024** to **28<sup>th</sup> June 2024**.

During her internship, she worked with the Product team, and her project was **"To Enhance & Optimize the Automation of Incident Management Process In A Hospital And Assess The Existing System"**.

Sowjanya's contributions include:

1. The current incident management system, its utilization, constraints, and the necessity for a new system at present.
2. The enhanced efficiencies of the newly implemented incident management system in comparison to the previous one.
3. A comparative analysis of the advantages offered by the new system and strategies to facilitate a shift towards reporting all incidents.

Her performance is satisfactory, and we wish her the best for her future endeavors.

Yours faithfully,

for **Narayana Hrudayalaya Limited.**,

  
**Deepashree J**  
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### DECLARATION BY STUDENT

I hereby declare that this dissertation titled COMPARATIVE ASSESSMENT OF CURRENT INCIDENT REPORTING SYSTEM WITH THE EARLIER LEGACY SYSTEM IN A MULTI-SPECIALITY HOSPITAL is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

  
(Signature)

Name of Student - Meeragani Venkata Vasavi Sowjanya.

Date: 21/07/2024.

## CERTIFICATE

This is to certify that dissertation titled “**Comparative assessment of current incident reporting system with the earlier legacy system in a multi-speciality hospital**” is a record of the research work undertaken by **Meragani Venkata Vasavi Sowjanya** in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur under my guidance and supervision and ~~his~~/her approach to the research study has been sincere, scientific, and analytical.



Mr. Vinod Kumar SV  
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Date 07/07/2024

## **ABSTRACT**

Ideally, alert and knowledgeable staff at the point of care would identify all the events and occurrences in a health service causing patient harm or having the potential to cause harm. They carefully document and communicate their observations. They would be enthusiastic about reporting because they would have many examples of how such reports had been used to improve the safety of care. Analysis of incident reports would take place through a dedicated team of patient safety specialists, with the view to identify the most important risks to patient safety and, once ranked, coordinate efforts in a systematic way into those problems. Such an investigation would be objective, multidisciplinary, involving relevant clinical expertise but also, importantly, non-health expertise derived from those disciplines which have made a successful contribution to the reduction of accidents elsewhere. It is research aimed at developing and improving the patient safety role, incident and adverse event reporting, and the flow from it that remains somewhat undeveloped.

### **Objectives:**

- To compare the existing process flow efficiency of IMS with the previous legacy system.
- To Suggest the measures and to enhance & optimize the Automation of incident management process in a multi-speciality hospital.
- To understand the IMS process flow.

**Methodology:** This research is done by using a mixed-methods approach, combining qualitative and quantitative techniques. The study is conducted in few of the units of Narayana Health city and NH Corporate office. Study population will be done on Nurses, Hospital staff, Quality team and other relevant stakeholders involved in IMS. Purposive sampling will determine the sample size. The data collection procedure is done on the basis of historical data of the previous legacy system and the current data after the implementation of IMS from the Quality team and NH corporate office administered to Incidents related to patients, Interviews with key stakeholders involved in Incidents and analysis of historical incidents data.

**Results:** The comprehensive study shows that the automation of incidents reported through IMS has increased overall efficiency while compared to its previous legacy system sapphire. Automation of the incident management process where Automation allows for handling a larger volume of incidents without proportional increases in staff, enabling the committee team to scale their operations efficiently. Automated incident management systems often provide detailed reports on incidents, which can be used to identify trends, root causes, and opportunities for improvement. Since after the implementation of IMS in few of the units the reporting of the incidents are properly reported without any long process or time taking. As the results are total 54 incidents are reported through IMS wherein, 98% are patient related incidents and 2% is environmental related incident. These findings highlights that there is still need of automation of incidents to the benefits in terms of improved response times, reduced downtime, and enhanced operational visibility are well worth the investment for many of the units in NH.

**Conclusion:** This comprehensive study provides a understanding of the complex dynamics surrounding temporary migration. This in-depth study offers valuable insight into the complex dynamics related to temporary migration. The document is to urge them to understand the purpose, strengths, and limitations of patient safety incident reporting. If the properties of the data derived from incident reports are carefully reviewed and conclusions drawn with caution, then they can be very valuable in understanding the scale and nature of the harm arising from healthcare. The use of incident reporting systems for true learning with a view to sustainable risk reduction and improvements in patient safety is still work in progress. It can be and has been done, but not yet to the scale and with the speed comparable to that seen in some other high-risk industries. That must be what we all strive for. I hope this technical guidance will help pave the way for our journey toward clearly demonstrating to our patients and their families how these learnings really helped us to provide them with safe and reliable care every time.

**Keywords:** Nurses, Hospital staff, Quality team and other relevant stakeholders involved in IMS.

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## **ABBREVIATIONS**

|       |                                                   |
|-------|---------------------------------------------------|
| ATHMA | Advance Total Healthcare Management Application   |
| CAPA  | Corrective & Preventive Action                    |
| CX    | Customer Experience                               |
| DA    | Digital Adoption                                  |
| DEO   | Data Entry Operators                              |
| EMR   | Electronic Medical Records                        |
| HMIS  | Hospital Management Information system            |
| IMS   | Incident Management system                        |
| IW    | International Wing                                |
| LIS   | Laboratory Information System                     |
| MSMC  | Mazumder Shaw Medical Center                      |
| NAMAH | Nursing Automation and Medical Administration Hub |
| NH    | Narayana Health                                   |
| NICS  | Narayana Institute of Cardiac Sciences            |
| RCA   | Root Cause Analysis                               |
| RIS   | Radiology Information System                      |
| UAT   | User Acceptance training                          |

## **CHAPTER 1: INTRODUCTION**

Incident Management System is an event /condition that could have resulted or did result in harm to a patient. It can be, but is not necessarily, the result of a defective system or process design, a system breakdown, equipment failure, or human error. It is defined as reporting of any event in the process of patient care, that is inconsistent with the deserved patient outcome or routine operations of the healthcare facility.

An incident management system is a set of processes, tools, and protocols that hospitals use to respond to and resolve incidents, and prevent related events from occurring in the future. An incident can be defined as any event that disrupts the normal operation of a hospital. This could be anything from a patient falling in the hallway to a natural disaster affecting the hospital's power supply.

There are many different types of incidents that hospitals may need to deal with on a regular basis. Some common examples includes such as Infectious disease outbreaks, Power outages, Patient falls, Natural disasters, Cybersecurity breaches, Hospital-acquired conditions, Equipment failures, Workplace violence, Fire, Environment of care safety hazard. The modern patient safety movement began in the last few years of the 20th century and has gained momentum through the first two decades of the new century.

Incident management automation uses technology to streamline incident detection, response, and resolution. By automating repetitive tasks, teams can focus on high value activities like threat hunting and analysis, reducing response times and minimizing downtime as its key benefits are faster incident detection and resolution, lower risk of human error and improved efficiency and productivity.

Having been stimulated by greater involvement of academics and practitioners from the field of safety outside health care, and by public concern about the level of avoidable harm during patient care, many health care systems around the world launched programmes aimed at

improving patient safety. During this period of development in patient safety, it was widely stated – and uncritically accepted – that a key step in reducing the risks associated with health care was to learn from the things that had gone wrong. This rapidly led to the establishment of patient safety incident reporting systems at health care facility level and, in some countries, at national level. The optimism that fuelled the rush to place reporting systems at the heart of patient safety programmes around the world has been replaced by scepticism (born of over a decade's experience of such systems) that reporting is not a stand-alone mechanism for reducing risk and improving safety. It needs to be part of an overall culture of curiosity and understanding about how harm occurs, a determination to expose all sources of risk to patients, coupled with well understood rules and processes of investigation and effective methods to implement change based on these learnings (the most difficult part of all) to improve safety.

Additionally, a goal of many health systems is to greater empower patients and their families so that they play an important role in identifying sources of risk and potential harm and helping to design safer systems, in addition to being fully engaged in their own care to prevent harm and reduce the risk of harm to them while receiving health care.

Benefits of an Incident Management system are Patient safety, Employee safety, Efficiency, Reputation and Legal liability.

- **Patient safety:** The most important reason for hospitals to have an incident management system is to ensure the safety of their patients. Incidents can occur at any time and can have serious consequences if they are not promptly addressed. By having a system in place to identify and resolve incidents, hospitals can minimize the risk of harm to their patients.
- **Employee safety:** While patient safety is paramount, it's also imperative to have a system in place to manage any incidents that may occur to ensure that everyone in the care setting is safe, especially those providing the care. This includes things like dealing with acts of violence, fires, power outages, and natural disasters. By having a reliable incident management system in place, hospitals can minimize the risk of injury to staff and visitors and ensure that they are able to return to their normal operations as quickly as possible.

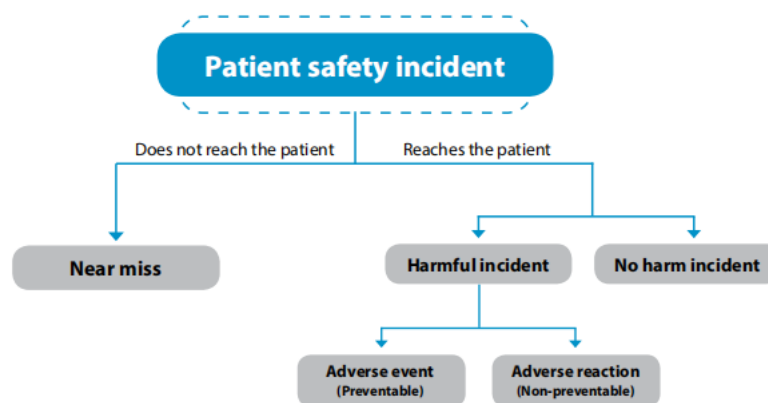
- **Efficiency:** An incident management system can help hospitals respond to incidents more efficiently. By having a set of established protocols to follow, hospitals can ensure that the appropriate response is taken in a timely manner. This can help prevent delays and reduce the impact of incidents on hospital operations.
- **Reputation:** Hospitals rely on their reputation to attract patients and maintain financial stability. Incidents that are not properly managed can damage a hospital's reputation and lead to a decline in patient trust. By having a reliable incident management system in place, hospitals can demonstrate their commitment to safety and quality care, which can help maintain their reputation.
- **Legal liability:** Hospitals are subject to a variety of legal regulations, including those related to patient safety and privacy. Failing to properly manage incidents can result in legal liabilities for hospitals, including fines and civil lawsuits. By having an incident management system in place, hospitals can help ensure that they are in compliance with legal requirements and minimize the risk of legal action.

There has been greater awareness of, and progress in, implementing and using patient safety reporting and learning systems in the 15 years since the draft guidelines were published. The guidelines have been widely used in different health care settings (national, local and facility levels) to establish priorities for data gathering and analysis in patient safety as well as in designing and evaluating reporting and learning systems. Much in these earlier guidelines is still relevant to the design and operation of patient safety incident reporting and learning systems. This document has two main purpose is to provide an up-to-date perspective on patient safety incident reporting and learning systems currently in place, including how to fill in existing gaps in these systems; and to provide practical guidance on the establishment and effective use of patient safety incident reporting and learning systems.

It is also helpful to keep in mind the conceptualization of patient safety incidents into three types – near miss, no harm incident, harmful incident – as explained in the World Health Organization (WHO) conceptual framework for the International Classification for Patient Safety. The definitions of these three types are:

1. **Near miss:** an incident that did not reach the patient (for example, a unit of blood being connected to the wrong patient's intravenous line, but the error was detected before the transfusion started);
2. **No harm incident:** one in which an event reached a patient, but no discernable harm resulted (for example, if the unit of blood was transfused, but was not incompatible);
3. **Harmful incident:** an incident that results in harm to a patient (for example, the wrong unit of blood was transfused, and the patient died from a haemolytic reaction). With regard to a harmful incident, an “adverse event” is an incident that results in preventable harm to a patient; an “adverse reaction” is non-preventable harm resulting from a justified action where the correct process was followed for the context in which the incident occurred.

**Figure 1. Classification of patient safety incidents**



### 1.1 Research problem:

“The lack of adequate support mechanisms at the grassroots level poses a significant barrier to accessing and benefiting from Incident reporting systems in hospital. The problems associated with incident reporting are remarkably consistent, whichever system design is adopted.

First, under reporting is the norm, although its degree varies. This depends mainly on the prevailing culture and whether incidents are considered as an opportunity to learn or as a basis for enforcing individual accountability and apportioning blame. It also relates to staff perceptions about the difference their reports will make and how easy it is for them to convey the information that they are required to.

Second, if the staff are fully committed to reporting, the volume of reports made can be very high; In such circumstances there may be insufficient time, resources and expertise dedicated or committed to carrying out the analysis required. However, most airlines collect large quantities of reports, but still find sufficient time and resources to investigate most incidents. This emphasizes the need to make an active decision to allocate the resources required to do this properly. It is not a weakness of reporting and learning systems, but rather of how they are instituted and managed.

Third, as is the case with other databases in health care, the balance of activity within reporting systems often goes on collecting, storing and analysing data at the expense of using it for improvement. Reporting rates are generally much lower in primary care services than in hospitals. This is not surprising, given the predominant focus on hospital-based safety. Even in high-resource settings, there is a need to develop an infrastructure for patient safety in primary care that can enable reporting from settings ranging from practitioners working single-handedly through to large consortia of collaborating practices. In low-resource settings, the challenge is to design systems that can adapt to the different forms of primary care with variable formats of patient records, including their absence.

### **1.2 Objectives:**

- Objective No. 1: To compare the existing process flow efficiency of IMS with the previous system.
- Objective No.2: To suggest the measures and to enhance & optimize the automation of IMS in a multi-speciality hospital
- To understand the IMS process flow.

### **1.3 Aim:**

The study aims to enhance the accessibility and effectiveness of using IMS automation and also to provide an up-to-date perspective on patient safety incident reporting & learning systems currently in place, including how to fill in existing gaps in these systems. The study aims to provide practical guidance on the establishment & effective use of patient safety incident & learning systems by identifying data from current software ecosystem which can help trigger incidents automatically. So that the team will find the product gaps in the current ecosystem which can be bridged to trigger more incidents automatically. Classifying and

documenting the incidents based on their scope for automation to increase the volume of reported incidents and to reduce the TAT for incident workflow. Together, these objectives aim to create a comprehensive support system for incident reporting and ensuring protection.

## CHAPTER 2: REVIEW OF LITERATURE

| S.No. | Author and Year       | Title/ Objectives of the study                                                                                                                                                                                                                     | Study           | Key Findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.    | Vincent Charles, 2023 | A comparative analysis to assess the efficiency of incident management systems (IMS) specifically in hospital environments. The study aimed to evaluate how different systems, particularly IMS and Sapphire, handle incident reporting processes. | Cross-sectional | <ul style="list-style-type: none"> <li>● <b>Under reporting Norm:</b> under reporting remains a significant issue across different incident reporting systems, influenced heavily by organizational culture and perceptions of accountability. This underscores the persistent challenge of encouraging staff to report incidents consistently.</li> <li>● <b>Resource Allocation:</b> The study highlighted that when staff are encouraged and committed to reporting incidents, the volume of reports can be substantial. However, there is often a shortfall in resources, time, and expert.</li> <li>● <b>Database Utilization:</b> Similar to other healthcare</li> </ul> |

|    |                          |                                                                                                                                                                                                                                                                            |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                          |                                                                                                                                                                                                                                                                            |                 | <p>databases, incident reporting systems tend to prioritize data collection and storage over using the data for actionable improvements. This imbalance indicates a need for systems that not only gather incident data but also facilitate its effective utilization for enhancing patient safety practices.</p>                                                                                                                                                                                                                                                |
| 2. | Jessica Greenfield, 2022 | <p>aimed to enhance and optimize the automation of incident management processes within hospital environments.</p> <p>The study focused on identifying gaps in existing incident reporting systems and developing practical strategies to automate incident detection,</p> | Cross-sectional | <ul style="list-style-type: none"> <li>● <b>Automation Potential:</b> By automating incident detection and initial reporting processes, hospitals could reduce the burden on staff and improve the timeliness of incident response.</li> <li>● <b>Technology Integration:</b> The study emphasized the importance of integrating current software ecosystems within hospitals to enable automatic incident triggers. This approach not only streamlines incident reporting but also enhances the accuracy and completeness of incident data captured.</li> </ul> |

|    |                    |                                                                                                    |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----|--------------------|----------------------------------------------------------------------------------------------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                    | reporting, and workflow management effectively.                                                    |                 | <ul style="list-style-type: none"> <li>● <b>Workflow Efficiency:</b><br/>Implementing automated incident management processes has the potential to reduce the Turnaround Time (TAT) for incident workflows. Greenfield highlighted that by classifying and documenting incidents based on their automation feasibility, hospitals can optimize their incident management systems for faster resolution and improved patient safety outcomes.</li> </ul>                                                                      |
| 3. | Emily Nguyen, 2021 | Culture and Accountability in Incident Reporting: A Comparative Analysis Across Healthcare Systems | Cross-sectional | <ul style="list-style-type: none"> <li>● <b>Cultural Influence:</b><br/>organizational culture significantly impacts incident reporting rates. Cultures that view incidents as opportunities for learning rather than assigning blame tend to have higher reporting rates. This highlights the importance of fostering a supportive reporting culture within healthcare settings.</li> <li>● <b>Accountability Dynamics:</b><br/>The study revealed that the perception of individual accountability also plays a</li> </ul> |

|    |                       |                                                                                          |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----|-----------------------|------------------------------------------------------------------------------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                       |                                                                                          |                 | <p>crucial role in incident reporting behaviors.</p> <p>Healthcare professionals are more likely to report incidents when they feel supported and believe their reports contribute to improving patient safety, rather than solely assigning blame.</p> <ul style="list-style-type: none"> <li>● <b>Improvement Initiatives:</b> Organizations with proactive strategies to promote a learning-oriented culture saw improvements in incident reporting rates and the quality of data collected. This suggests that initiatives focused on cultural change and accountability can positively influence incident reporting outcomes.</li> </ul> |
| 4. | Michael Johnson, 2020 | Utilization of Incident Data in Healthcare: Challenges and Opportunities for Improvement | Cross-sectional | <ul style="list-style-type: none"> <li>● <b>Data Utilization Challenges:</b> Healthcare organizations collect substantial amounts of incident data, there are significant challenges in effectively utilizing this data for improving patient safety. These challenges include data fragmentation, lack of</li> </ul>                                                                                                                                                                                                                                                                                                                         |

|    |                     |                                                    |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----|---------------------|----------------------------------------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                     |                                                    |                 | <p>standardized reporting practices, and insufficient resources for data analysis.</p> <ul style="list-style-type: none"> <li>● <b>Opportunities for Improvement:</b> The study highlighted opportunities to enhance incident data utilization through better integration of reporting systems with clinical workflows, enhanced data analytics capabilities, and promoting a culture of continuous improvement based on actionable insights from incident reports.</li> <li>● <b>Impact on Patient Safety:</b> Effective utilization of incident data has the potential to significantly enhance patient safety outcomes by identifying systemic issues, implementing targeted interventions, and fostering a proactive approach to risk management within healthcare settings.</li> </ul> |
| 5. | Sarah Roberts, 2023 | to examine the impact of technology integration on | Cross-sectional | <ul style="list-style-type: none"> <li>● <b>Technological Advancements:</b> Roberts found that hospitals leveraging advanced incident</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

|  |  |                                                     |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--|--|-----------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  | incident reporting efficiency in leading hospitals. |  | <p>reporting software and integrated systems experienced improvements in reporting efficiency. These systems streamlined data capture, incident notification, and workflow management, reducing administrative burdens and improving timeliness in incident response.</p> <ul style="list-style-type: none"> <li>● <b>Real-time Reporting:</b> Integration of real-time reporting capabilities enabled hospitals to capture incidents promptly, enhancing the accuracy and completeness of incident data. This facilitated quicker interventions and mitigated potential risks to patient safety.</li> <li>● <b>User Interface and Adoption:</b> The study emphasized the importance of user-friendly interfaces and staff training in maximizing the adoption and effectiveness of incident reporting technologies. Hospitals that invested in training programs and</li> </ul> |
|--|--|-----------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|    |                   |                                                        |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----|-------------------|--------------------------------------------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                   |                                                        |                 | <p>intuitive software interfaces reported higher engagement and more consistent reporting practices among healthcare professionals.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 6. | David Smith, 2022 | Impact of Incident Reporting Systems on Patient Safety | Cross-sectional | <ul style="list-style-type: none"> <li>• <b>Risk Identification and Mitigation:</b> Incident reporting systems play a crucial role in identifying and mitigating risks. By capturing and analyzing incident data, healthcare organizations can proactively address systemic issues and implement targeted interventions to prevent adverse events.</li> <li>● <b>Quality Improvement Initiatives:</b> incident reporting systems support quality improvement initiatives by facilitating learning from incidents and implementing corrective actions. Continuous feedback loops enable healthcare teams to optimize patient care delivery processes.</li> </ul> |

## **CHAPTER 3: METHODOLOGY**

This study aims to investigate & understand the incidents by going through each and every detail & also to understand the Athma module to familiarise with workflow of the relevant module to observe the actual process by visiting the hospital to go through the actual workflow & ask probing questions to clarify doubts so that it would be easy to classify the incidents based on current & future scope for automation by documenting the observations, key findings, steps to automate, any product gaps, future recommendations & limitations.

The data collection procedure is done on the basis of historical data of the previous legacy system and the current data after the implementation of IMS from the Quality team and NH corporate office administered to Incidents related to patients, Interviews with key stakeholders involved in Incidents and analysis of historical incidents data.

During the study period, there were 105 incidents which are reported out of which considering the feasibility, randomly chosen incidents were 55. Primary data on incident reportings were done through process mapping based on departmental process flow and in-depth interviews were taken from the quality team.

Secondary data on incident reporting is collected from NH corporate office and Incident Management system data is collected from the Quality team.

The survey was carried out from April 1st, 2024, to June 30th, 2024.

### **3.1 Research Methodology:**

#### **3.1.1 Research Question:**

Q1. How can patient safety automation of IMS through ATHMA aims to provide a better way for patient care better than the legacy system?

Q2. What measures could improve the efficiency of IMS in a multi-speciality hospital?

**3.1.2 Study Design:** This is a departmental-based Observational and descriptive study.

**3.1.3 Type of study:** Mixed-method research

**3.1.4. Study Setting:**

This study was conducted with the coordination and support of the NARAYANA HEALTH organization and the study participants were taken from the different departments specially the quality team of the NICS Block and NH corporate office.

**3.1.5. Study location:**



### **3.1.6 Research Procedures/Approach:**

As we have two objectives, we decided to focus on the implementation of Incident Management System and automation of the incidents to detect and take the preventive action plan. split the Incident Management form into based on the severity, sequence, type, likelihood and status wise to keep a tracking status and also for better implementation of providing new measures. The first section focuses on type wise incidents that are happening as currently IMS deals with patient related incidents and environmental incidents. while the second section is dedicated to sequence wise count of the incidents that are reported, following up with severity wise, likelihood wise and status wise count for giving a better way of reporting and doing a root cause analysis and giving solution by implementing a (CAPA) Corrective and Preventive Action plan. During the study period, there were 105 incidents which are reported out of which considering the feasibility, randomly chosen incidents were 55. Primary data on incident reportings were done through process mapping based on departmental process flow and in-depth interviews were taken from the quality team.

Secondary data on incident reporting is collected from NH corporate office and Incident Management system data is collected from the Quality team using mixed-methods approach based on direct observation.

Through the sampling approach, 55 respondents from few of the units of NH has been reported the incidents based on the real time incident situation. Users had been selected from quality team and after few of the users who reported the incidents through IMS. Those incidents were chosen by random sampling technique based on the number of incidents. Concurrently, we conducted interviews and discussion with the quality team and did an observation on few of the departments to understand how the incidents are reported and in what ways the incidents can be automated.

### **3.1.7 Study Populations:**

Quality team from the NICS block and all the identified healthcare staff in different departments of Health city who have been reporting the incidents through Incident Management System and migrating almost 4-5 weeks back from Sapphire.

### **3.1.8 Sample Size:**

As we are focusing on the implementation of IMS, total 55 was the sample size considering the feasibility the sampling was chosen, incidents that have been reported after the implementation from different units of Narayana Health since past 5-6 weeks after the implementation and for the automation of Incident management system data is gathered based on the references. The sample size was determined based on feasibility considering the limited period of study.

### **3.1.9 Study Tools:** Structured interviews and Observational checklist

### **3.1.10 Duration of study:** 3 months

### **3.1.11 Sampling Technique:**

Simple random sampling was done to select the incidents.

### **3.1.12 Data Analysis Plan:**

- **Software:** Statistical analysis will be conducted using EXCEL.
- **Descriptive Statistics:** Descriptive statistics will be used to summarize the characteristics of the study sample, including frequencies, percentages, means, and standard deviations.
- **Level of Significance:** A significance level will be used to determine statistical significance for all analyses.

### **3.1.13 Data Collection and Management:**

Data collection was done after the implementation of IMS. The Quality team and structured interviewer-administered interview was used to collect information on awareness about incidents so that the committee team takes the preventive and corrective actions regulations. Data collection was done using the number of incidents reported from the IMS. Data was transferred to an Excel sheet which served as the database where the type wise incidents, severity wise incidents, sequence wise incidents, likelihood wise incidents and the upcoming tracking status of the incident data was undertaken on a fortnightly basis.

### **3.2 Hypothesis:**

#### **Observational study:**

- Null Hypothesis (H0): There is no difference with the current system in the process flow efficiency system when compared with the earlier system Sapphire
- Alternative Hypothesis (H1): Process flow efficiency of new system has a better outcome compared to earlier system.

### **3.3 Operational Definitions:**

- **Adverse event:** an incident that results in preventable harm to a patient
- **Adverse reaction:** unexpected and non-preventable harm resulting from a justified action where the correct process was followed for the context in which the event occurred
- **Ameliorating action:** an action taken or circumstances altered to make better or compensate any harm after an incident.

- **Contributing factor:** a circumstance, action or influence that is thought to have played a part in the origin or development of an incident or to increase the risk of an incident
- **Detection:** an action or circumstance that results in the discovery of an incident.
- **Error:** failure to carry out a planned action as intended or application of an incorrect plan.
- **Event:** something that happens to or involves a patient
- **Hazard:** a circumstance, agent or action with the potential to cause harm
- **Incident:** any deviation from usual medical care that either causes an injury to the patient or poses a risk of harm, including errors, preventable adverse events and hazards.
- **Incident characteristics:** selected attributes of an incident.
- **Incident type:** a descriptive term for a category made up of incidents of a common nature, grouped because of shared, agreed features.
- **Mitigating factor:** an action or circumstance that prevents or moderates the progression of an incident towards harming a patient.
- **Near miss:** an incident that did not reach the patient.
- **Never event:** a patient safety incident that results in serious patient harm or death (this refers to particularly shocking medical errors - such as wrong-site surgery, that should never occur)
- **Patient characteristics:** selected attributes of a patient.
- **Patient outcome:** the impact upon a patient that is wholly or partially attributable to an incident.
- **Patient safety:** a framework of organized activities that creates cultures, processes and procedures, behaviours, technologies, and environments in health care that consistently and sustainably: lower risks, reduce the occurrence of avoidable harm, make error less likely and reduce its impact when it does occur.
- **Root cause analysis:** a systematic iterative process whereby the factors that contribute to an incident are identified by reconstructing the sequence of events and repeatedly asking why? until the underlying root causes have been elucidated.

- **Sentinel event:** an unexpected occurrence involving death or serious physical or psychological injury, or the risk thereof. Serious injury specifically includes loss of limb or function. The phrase “or risk thereof” includes any process variation for which a recurrence would carry a significant chance of a serious adverse outcome.

### **3.4 Ethical Considerations:**

- **Informed Consent:**

Before participation in the study, all participants will be provided with detailed information about the purpose, procedures, risks, and benefits of the study. Informed consent will be obtained from each participant, ensuring that they understand their voluntary participation and their right to withdraw from the study at any time without consequence.

- **Protection of Participant Confidentiality:**

Measures will be implemented to protect the confidentiality and privacy of staff members whosoever reported the incident. Data collected will be anonymized and stored securely, with access limited to authorized research personnel, Assignee and investigator only. Staff who reported incident will be assured that their responses will be kept confidential and will not be shared with anyone except the assignee and committee team outside of the research team.

- **Voluntary Participation:**

Reporting and analysing the real incident reporting data in this study will be entirely confidential and staff will not face any coercion or fear to report. They will be informed that they can decline to participate or withdraw from the study at any point without consequence.

- **Respect for Cultural Sensitivities:**

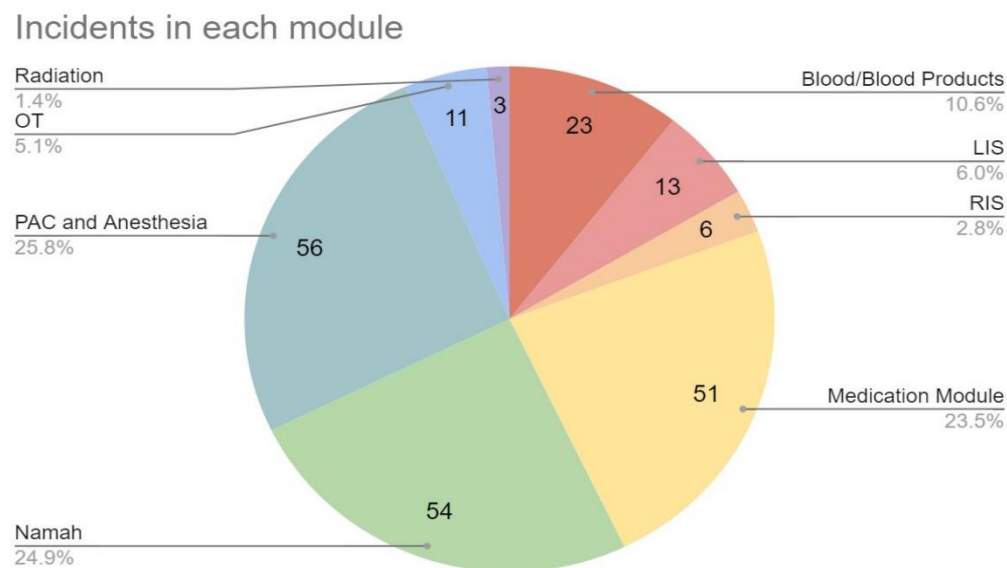
The Incident Management data will be taken with sensitivity to the cultural norms, beliefs, and practices of the communities involved, particularly considering the privacy of the

staff members in reporting. Researchers will seek to build rapport and trust with the staff members, respecting their preferences throughout the research process.

## CHAPTER 4: RESULTS

### 4.1 IMS Findings

#### 4.1.1 No.of identified incident types:



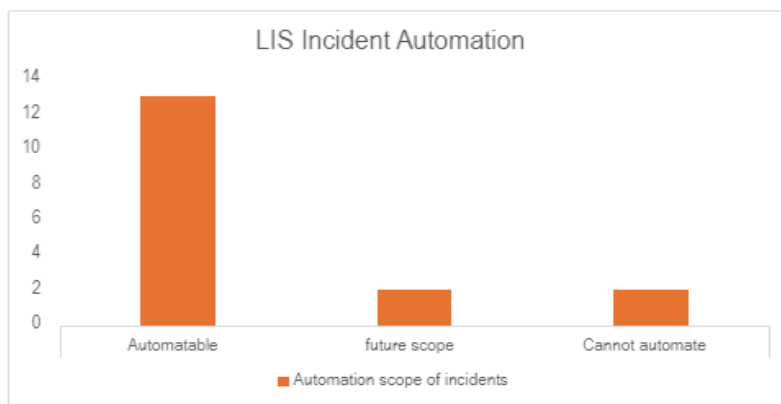
**Figure 4.1.1 Total no.of identified incident types.**

This section will present the findings about 218 incidents that are originating from 8 different departments in the NICS, covering aspects such as their current incident situation, Incident categorization, incident sub categorization and reasons behind their incident why it happened and how it happened.

The Pie chart highlights the total number of incident types that are to be addressed if any incident occurs in the respective departments. Predominant Incident subcategories

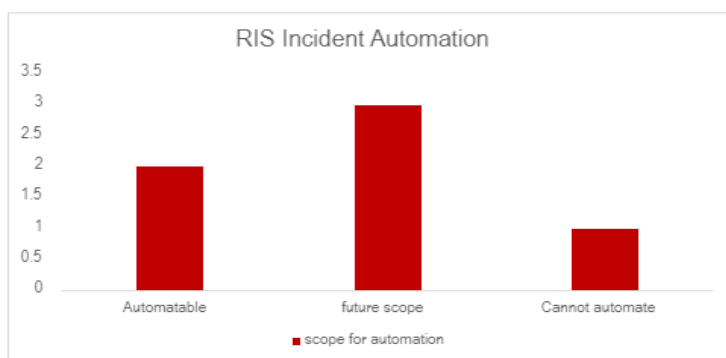
percentage denotes accordingly based on the types of incidents. PAC & Anesthesia denotes 25.8% where Namah incident sub category denotes 24.9% which includes care processing and all, with 23.5% of Medication module choosing with all the medication errors, while only 10.6% are blood/blood products, LIS incidents denotes 6.0% in which sample rejection, lab errors falls under these sub categories, while 5.1% incidents falls under OT, whereas RIS incident errors denotes 2.8% and Radiation errors denotes 1.4%. Among the total incidents surveyed, Total number of identified incident types are 218.

#### **4.2 Scope for incident Automation analysis:**



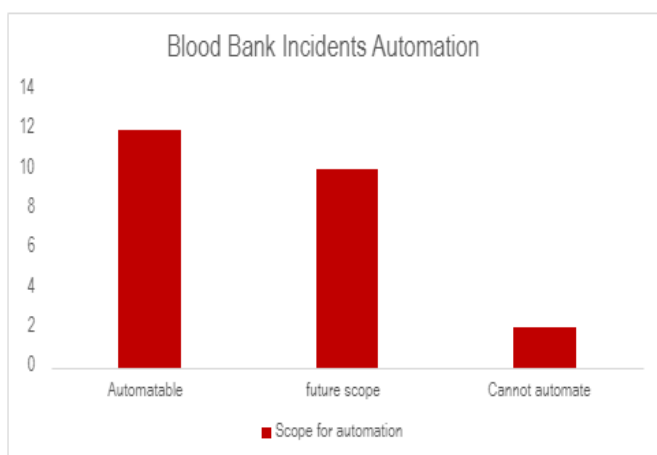
**Figure 4.2.1: Laboratory Information System ( LIS) Incidents.**

The survey encompassed 218 identified incident types. The data revealed a predominance of 13 identified incidents in LIS ( Laboratory Information system) in which 9 incidents are automatable, 2 of the incidents are future scope, 2 of the incidents cannot be automated. There are some of the reasons which leads to these incidents are such as like Instrument failures, Abnormal test results, Turn around time results, Specimen labelling errors, Quality control failures. The graph indicates the LIS incidents that are automatable, future scope and incidents which cannot be automated. Though it's noteworthy that these incidents has to be reported so that the assignee and investigator team takes the corrective and preventive action to ensure the patients safety.



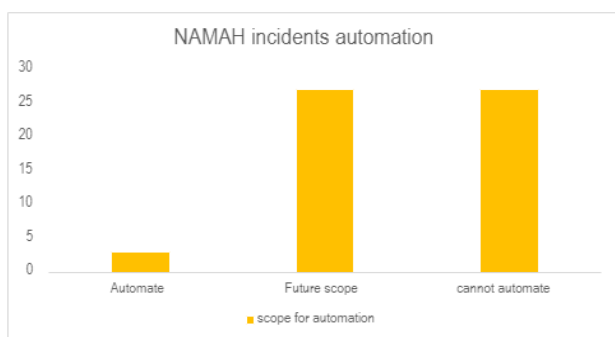
**Figure 4.2.2: Radiology Information System Incidents.**

Out of 218 identified incident types, the systems for reporting incidents such as patient safety issues, equipment malfunctions or data breaches. This can include integrating incident reporting forms directly into the Radiology information system (RIS) or electronic health record (EHR) system. Further 6 number of incidents are identified under RIS in which 2 incidents are automatable, 3 incidents are future scope and 1 incident cannot be automated. Radiology departments need to enhance patient safety, improve operational efficiency, comply with regulatory requirements.



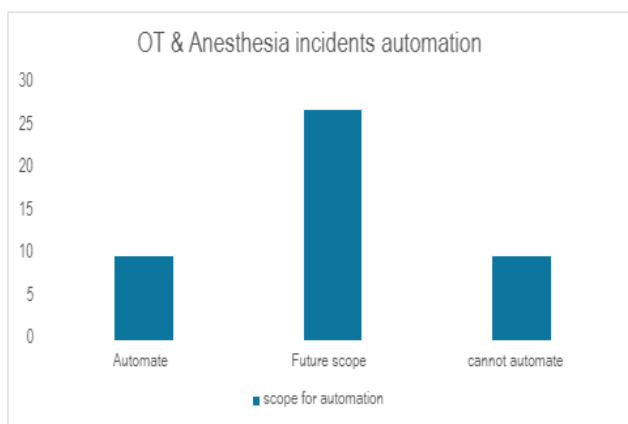
**Figure 4.2.3: Blood bank incidents.**

The graph illustrates the number of automated blood incidents that are happening, There are 24 identified Blood bank incidents indicating that 12 incidents are automatable, 10 incidents are future scope and 2 incidents cannot be automated. So basically 10.6% of the incidents are automated incidents by the blood bank. Incidents that gets reported in blood bank are most probably on transfusion reaction, Blood product tracking etc. Automation of incident management systems need to streamline processes but also foster a culture of safety, Quality and continous improvement within the blood banking environment.



**Figure 4.2.4: NAMAHA Incidents.**

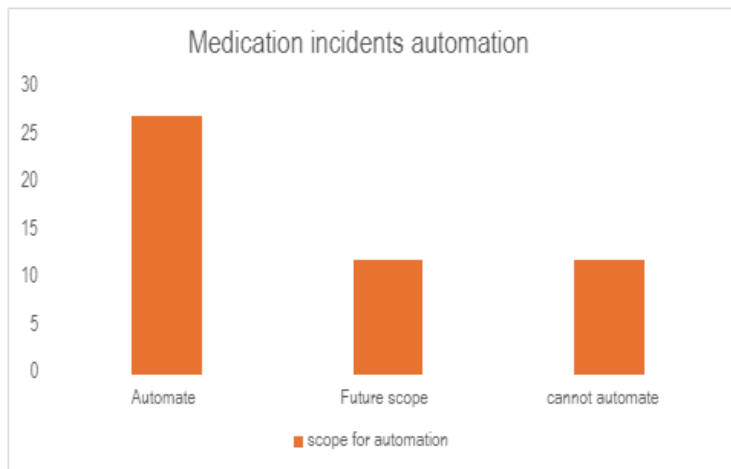
The majority of the automation of incidents that are identified in NAMAHA are 51 incidents in which 3 incidents can be automatable, 27 are future scope incidents and 27 cannot be automatable. The incidental errors that mostly occur in NAMAHA are I/O Chart, patient handover, Nurse category not being mapped and failed to create vitals. By integrating automated tools and systems, businesses can achieve faster response times, reduce human error, and improve overall operational efficiency. This approach not only enhances the ability to detect and mitigate incidents promptly but also facilitates continuous improvement through data-driven insights and streamlined workflows. By leveraging NAMAHA incident automation offers substantial benefits to organizations by streamlining incident detection, response and resolution processes. NAMAHA incident automation empowers organizations to better protect their systems, data and operations in an increasingly dynamic and challenging digital landscape.



**Figure 4.2.5: OT & Anesthesia Incidents.**

Among the 218 identified incident types, 47 identified incidents comes under OT & Anesthesia in which 10 incidents are automatable, 27 incidents are future scope and 10 incidents cannot be automated. Incidents involving OT (Operating Theater) and anesthesia can be critical and require careful management due to their potential impact on patient safety and outcomes.

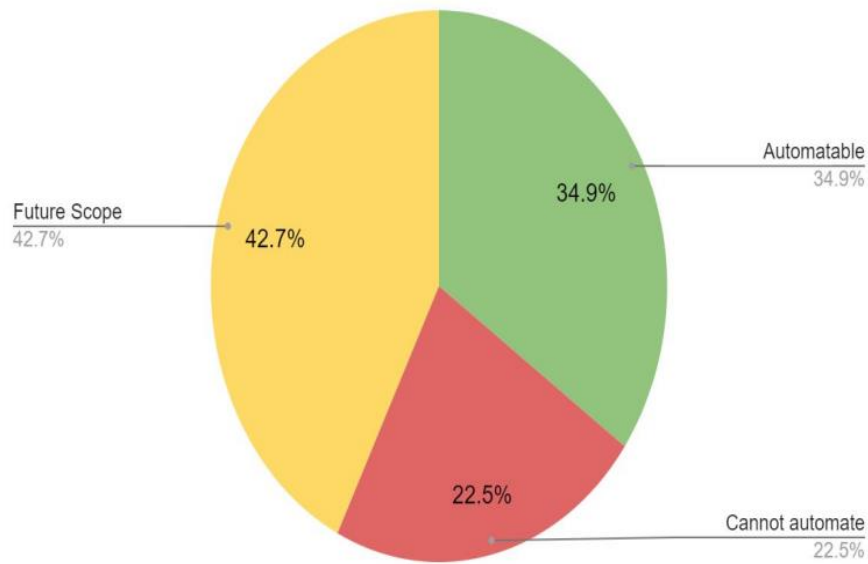
Analyzing the pie chart, the identified incidents among the different departments we can depict that Mistakes or incidents related to Operating Theater (OT) procedures and anesthesia administration can vary in nature and severity. These incidents may involve different aspects of patient care, procedural protocols, equipment failure, or human errors.



**Figure 4.2.6 Medication incidents.**

The pie chart denotes that 51 identified incidents comes under Medication in which again 27 incidents are automatable, 12 incidents are future scope and 12 incidents cannot be automated. Medication incidents refer to errors or adverse events related to the administration, prescribing, dispensing, or monitoring of medications. These incidents can occur at various stages of the medication process and can have significant implications for patient safety.

Automation Scope of Incidents



**Figure 4.2.7: Automation scope of incidents.**

Incidents can be directly automated with existing data points available in the software by founding minimum scope to automate incidents. Incidents can be partially automated with existing data points or with few additional features but would need extra steps to completely automate them.

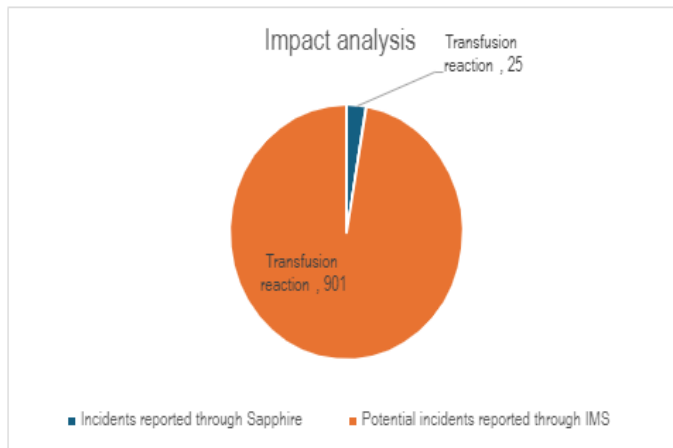
The pie chart denotes that 34.9% incidents are automatable, 42.7% incidents are future scope, 22.5% incidents cannot be automated.

**Table- 4.1 Comparison table of Sapphire & IMS**

| sr | Sapphire                                                 | IMS                                                         |
|----|----------------------------------------------------------|-------------------------------------------------------------|
| 1  | Minimum 15-20 clicks to report an incident               | Minimum 2-3 clicks to report an incident                    |
| 2  | Choosing service, category, subcategory can be confusing | Better way to report any incident without any complications |
| 3  | Need to login to a different link                        | Direct installation in ATHMA                                |

|   |                                                             |                                                       |
|---|-------------------------------------------------------------|-------------------------------------------------------|
| 4 | Raising incidents needs training due to complexity          | It does not need any training to report               |
| 5 | Wrong mapping for doctors who work from multiple facilities | Mappings are done exactly to their departments        |
| 6 | Time taking process to report an incident                   | Time consuming for users while reporting any incident |

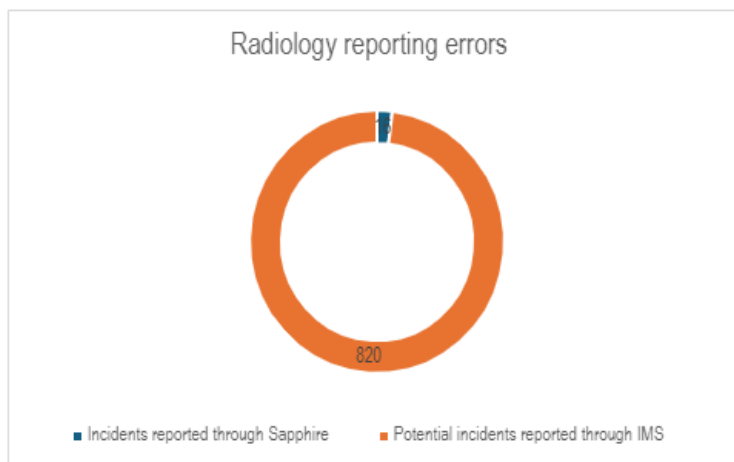
#### **4.3: Incident Automation- Impact analysis of IMS through ATHMA:**



**Figure 4.3.1: Impact analysis of IMS through ATHMA in Blood transfusion.**

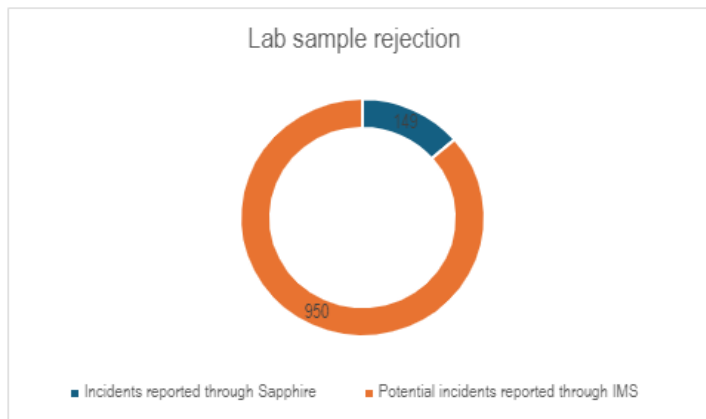
This graph provides insights into the incidents that can be automated through IMS- ATHMA wherein through sapphire only a very few incidents are reported which is 25 incidents from November 2023 to April 2024 under these blood bank category. It was seen that additional 901 incidents could have been reported using IMS but in the Nursing station most of the times transfusion reaction is showing yes but still the incidents have not been generated if the incidents have been automated by the time the transfusion reaction was clicked on yes then by now from November 2023 to april 2024 the potential incidents which can be detected through IMS would be 901 incidents. So this shows that there are many such kind of incidents happening but only a few or major kind of incidents are being reported through sapphire as sapphire is a a very long time taking process and each and every thing has to be

mentioned in detail so most of the users don't try to report because the users always look for a easy and better way to report the incident that is where IMS came in place where the incident can be reported in few clicks and then the incident can be reviewed by the investigation team as soon as possible and they will do the Root Cause Analysis, resolve the issue and take the preventive measures to not repeat the incident by implementing a Corrective And Preventive Action (CAPA) plan.



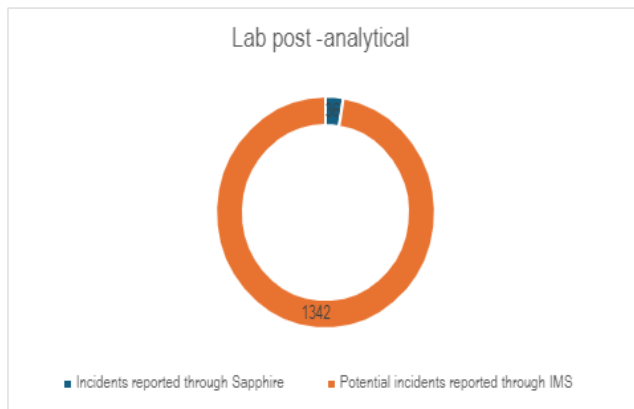
**Figure 4.3.2: Impact analysis of IMS through ATHMA in Radiology reporting errors.**

This graph provides insights into the incidents that can be automated through IMS- ATHMA wherein through sapphire only a very few incidents are reported which is 16 incidents from November 2023 to April 2024 under these Radiology reporting errors. but in the Radiology reporting worklist most of the times after the reports are certified the reports are again amended/ addendum due to some of the error in reports but these incidents are not been reported through sapphire. If the incidents have been automated by the time the reporting error has been amended then by now from November 2023 to april 2024 the incident rate through IMS would be 820 incidents to be detected, automated and reported. So this shows that there are many such kind of incidents happening but only a few or major kind of incidents are being reported through sapphire as sapphire is a a very long time taking process and each and every thing has to be mentioned in detail so most of the users don't try to report because the users always look for an easy and better way to report the incident that is where IMS came in place where the incident can be reported in few clicks and then the incident can be reviewed by the investigation team as soon as possible and they will do the Root Cause Analysis, resolve the issue and take the preventive measures to not repeat the incident by implementing a Corrective And Preventive Action (CAPA) plan.



**Figure 4.3.3: Impact analysis of sapphire & Automated IMS through ATHMA in Lab Sample rejection.**

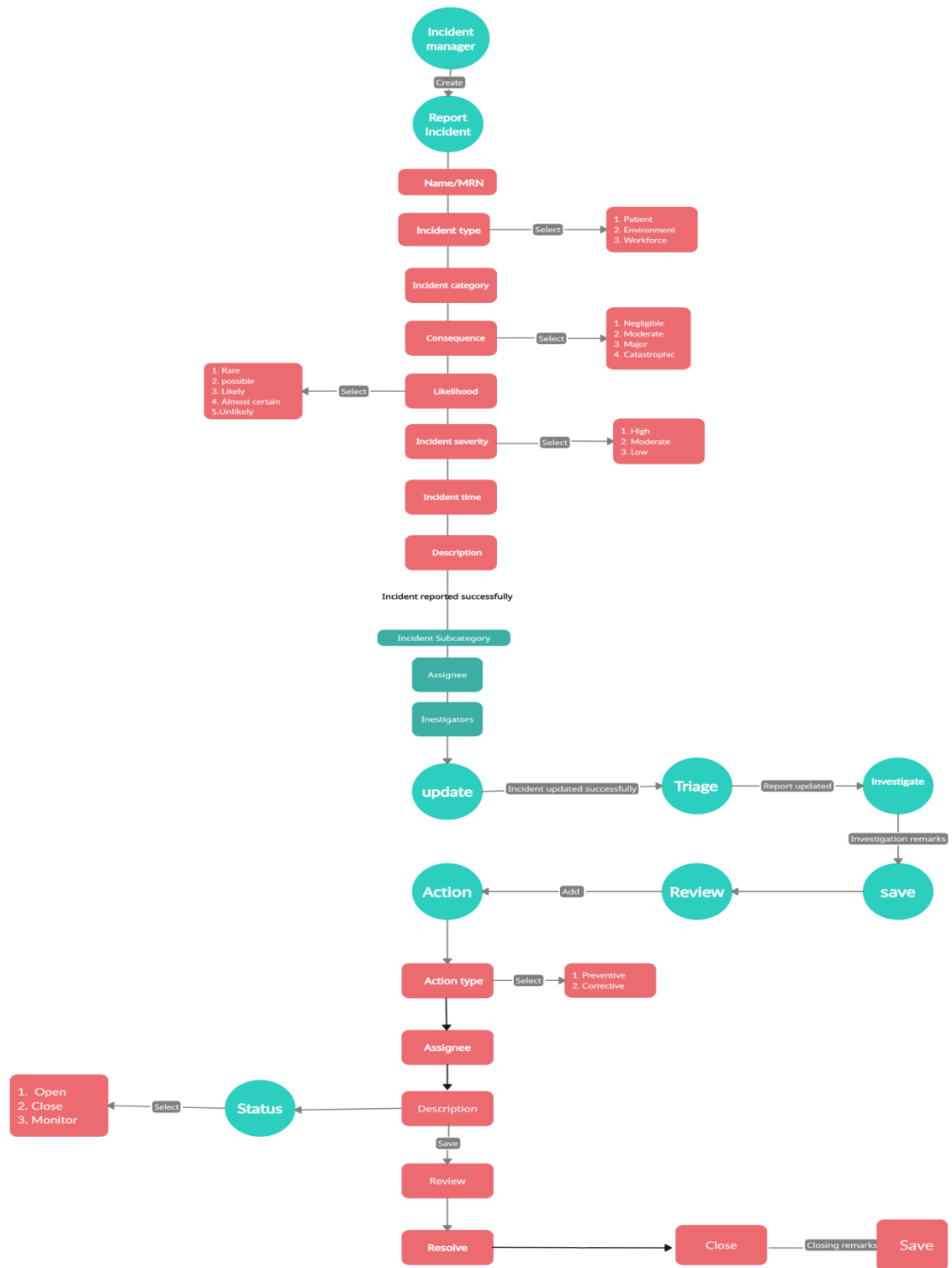
This graph provides insights into the incidents that can be automated through IMS- ATHMA wherein through sapphire only a very few incidents are reported which is 149 incidents from November 2023 to April 2024 under these Lab sample rejection. but after the lab sample is received most of the samples have been rejected after the receival due to some of the barcode error or there might be some other reason but these incidents are not been reported through sapphire. If the incidents have been automated by the time the lab sample has been rejected then by now from November 2023 to april 2024 the incident rate through IMS would be 950 incidents to be detected, automated and reported. So this shows that there are many such kind of incidents happening but only a few or major kind of incidents are being reported through sapphire as sapphire is a a very long time taking process and each and every thing has to be mentioned in detail so most of the users don't try to report because the users always look for an easy and better way to report the incident that is where IMS came in place where the incident can be reported in few clicks and then the incident can be reviewed by the investigation team as soon as possible and they will do the Root Cause Analysis, resolve the issue and take the preventive measures to not repeat the incident by implementing a Corrective And Preventive Action (CAPA) plan.



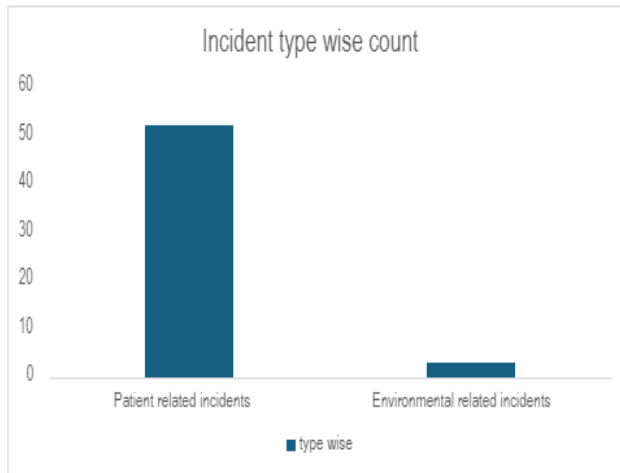
**Figure 4.3.4: Impact analysis of sapphire & Automated IMS through ATHMA in Lab post- analytical.**

This graph provides insights into the incidents that can be automated through IMS- ATHMA wherein through sapphire only a very few incidents are reported which is 36 incidents from November 2023 to April 2024 under these Lab post-analytical. but after the investigation result entry after the lab values are certified then again the samples going for resampling process which is post analytical is something a major error which happened over there but these incidents are not been reported through sapphire. If the incidents have been automated by the time the lab reports have gone for resample then by now from November 2023 to april 2024 the incident rate through IMS would be 1342 incidents to be detected, automated and reported. So this shows that there are many such kind of incidents happening but only a few or major kind of incidents are being reported through sapphire as sapphire is a a very long time taking process and each and every thing has to be mentioned in detail so most of the users don't try to report because the users always look for an easy and better way to report the incident that is where IMS came in place where the incident can be reported in few clicks and then the incident can be reviewed by the investigation team as soon as possible and they will do the Root Cause Analysis, resolve the issue and take the preventive measures to not repeat the incident by implementing a Corrective And Preventive Action (CAPA) plan.

**Diagram 4.1- FLOW CHART OF INCIDENT MANAGEMENT SYSTEM (IMS)**



#### **4.4: Implementation of IMS.**



**Figure 4.4.1: Type wise incident reports.**

This graph depicts that the incidents are related with two types of factors one is patient related incidents and the other one is environmental related incidents. So based on these two factors the incidents are being reported through IMS. It shows that 98% of the incidents are patient related and rest 2% of the incidents are environmental related.



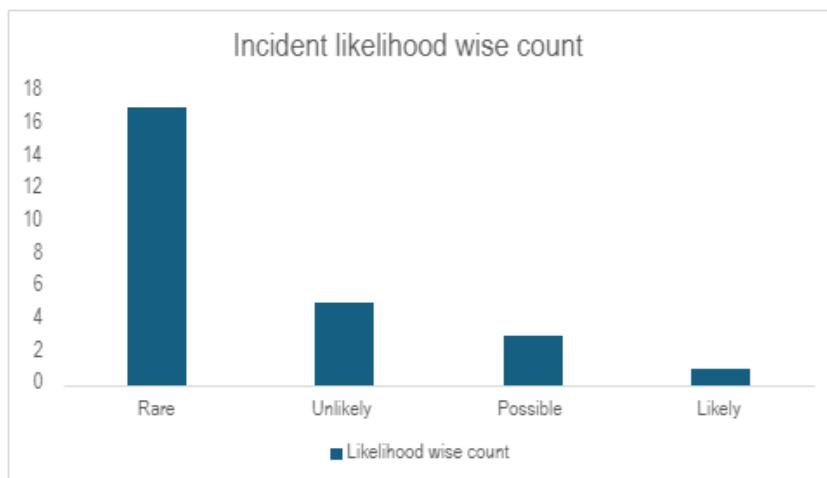
**Figure 4.4.2: IMS sequence wise count.**

This graph provides insights into the sequence of the incidents that are reported through ATHMA. The incident sequence that occurred is might be either minor, negligible and moderate. So based on the incident that occurred in any of the unit or department, need to analyse and give the sequence accordingly. After analyzing the graph can say that minor incidents that are reported through IMS are 6, negligible incidents reported through IMS are 3 and moderate incident reported through IMS are 2.



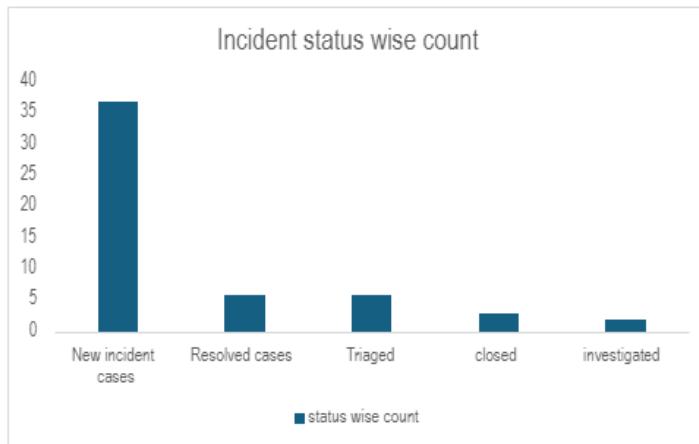
**Figure 4.4.3: IMS Severity wise count.**

This graph highlights the severity wise incidents that are reported through IMS to identify whether the incident that is reported under low category or moderate category or high category. There are total 55 incidents that are reported after the implementation of IMS in which 16 incidents are low, 8 incidents are moderate and 2 incidents are high.



**Figure 4.4.4: IMS Likelihood wise count.**

This section analyses the likelihood wise count of the incidents that are reported through IMS after the implementation of IMS to analyze that incidents that occur in most possible cases or in rare cases or likely or unlikely cases. So here the graph depicts that rare cases that are reported through IMS are 17, Unlikely incidents that has been reported through IMS are 5, possible incidents that are reported through IMS are 3 and likely incidents reported through IMS are 1.



**Figure 4.4.5 IMS status wise count**

The graph illustrates the status of the incidents after reporting to know the current status and upcoming track of the incidents that are reported through IMS. As the graph depicts that new incident cases that are reported through IMS are 37, whereas resolved cases in IMS are 6, traiged cases are also 6, closed incident cases are 3 and the incidents which are still on the investigation process are 2. this gives the upcoming tracking status of the incidents which are reported, traiged, resolved, closed, investigation still going on etc.

## CHAPTER: 5 DISCUSSIONS

To effectively compare the efficiency of an automated Incident Management System (IMS) process flow with a legacy system Sapphire , several key findings typically emerge TAT flow of Incident Reporting compared to IMS & sapphire whereas IMS Utilizes less time to report an incident through IMS and in Sapphire maximum 20 clicks to report an incident by mentioning each and every point in detail. Accuracy and Consistency in Incident Triage in IMS predefined rules and automated workflows for incident triage, ensuring consistent and accurate prioritization. Resource Optimization and Allocation in IMS Optimizes resource allocation based on incident severity and impact, ensuring efficient use of personnel and equipment whereas in Legacy System the resource allocation decisions are often ad-hoc and may not be optimized for maximum efficiency during incident response. Reporting and Analytics Capabilities in IMS provides real-time incident reports and analytics, facilitating proactive identification of trends and root causes. Scalability and Adaptability in IMS scales effectively to handle increasing incident volumes without proportional increases in resources, adapting workflows and processes as needed. The user also feels less burden while reporting the incident as it is less time consuming and no need of logging into an another website while we can report the incident through IMS in ATHMA whereas in Sapphire we need to login to a different website and add on the incident categories and sub categories. Continuous Improvement in Patient Care in IMS Supports a culture of continuous improvement by providing an easy and better way to report an incident by taking feedback loops from incident reports to enhance patient care processes and protocols. Legacy System improvement initiatives may be slower to implement without clear, structured feedback mechanisms from incident data because in Sapphire to report an incident or to give any feedback it takes hardly 10-15 clicks so most of the times the user feels not so important to give time to this whereas in IMS its an easy way of reporting and giving feedback. Levels of incident reportings are very low; to a large extent, this reflects a fear by staff of retribution against them as individuals. A lack of consistent leadership in patient safety at national and local levels means that awareness of the value of reporting is low.

Reporting is too much time consuming through sapphire by logging into a different website to report the incident for staff who are already dealing with very high workloads. There is a great need for more information technology support.

**Drawbacks of Sapphire:**

1. Minimum 20 clicks to report an incident
2. Choosing service, category, sub category can be confusing
3. Need to login to a different link
4. Raising incidents needs training due to complexity
5. Wrong mapping for doctors who work from multiple facilities
6. No notifications
7. Time taking process to report an incident

**Incident Management System benefits:**

1. Better way to report an incident without any complication
2. Direct installation in ATHMA
3. Minimum 2-3 clicks to report an incident
4. It does not need any training to report the incident

Comparing Incident Management System process flow efficiency with its previous legacy system Sapphire highlights the transformative impact of incident management. The Incident Management System significantly enhances speed, accuracy, and consistency in incident detection, response, and resolution, while also optimizing resource allocation, improving reporting capabilities, and ensuring scalability and operational efficiency. These key findings underscore the advantages of adopting modern Incident management solutions over the previous legacy systems in effectively managing and mitigating incidents within organizations.

The IMS patient safety incident reporting system aims to provide a more efficient, accurate and proactive approach to managing patient safety incidents compared to its sapphire. IMS enhances incident reporting, communication, data analysis, compliance, and overall patient care, ultimately leading to improved outcomes and increased trust in healthcare delivery.

The study highlights the potential of enhancing and optimizing the automation of incident management process in a hospital by improving and optimizing the automation of incident management processes in a hospital setting is crucial for ensuring efficient and effective patient care, staff management, and overall operational excellence.

Integration of Technology in Electronic Health Records (EHR) through implementing automation can start with integrating incident reporting directly into EHR systems. This allows for seamless documentation and tracking of incidents, which is essential for analysis and improvement. IoT devices utilizing Internet of things devices can automate incident reporting by detecting abnormalities in patient vitals, equipment malfunctions, or environmental issues such as temperature or humidity levels.

Automated Alerts and Notifications by setting up automated alerts for critical incidents can ensure that healthcare providers respond promptly, reducing the response time during emergencies

Streamlined Incident Reporting through user-friendly interfaces by designing user-friendly interfaces for incident reporting systems encourages staff to report incidents promptly and accurately. Mobile applications can be particularly useful for this purpose. Standardized Incident Categories: Having a standardized list of incident categories helps in categorizing and prioritizing incidents for appropriate responses and analysis. Real-Time Reporting: Automation can enable real-time reporting of incidents, providing immediate visibility to hospital administrators and managers.

Data analysis and continuous improvement Analytics Tools by implementing analytics tools can help identify trends in incidents, root causes, and areas for improvement. This data-driven approach can guide decision-making and resource allocation. Feedback Loops by establishing feedback loops where incident reports lead to actionable insights and improvements in hospital protocols and procedures. Benchmarking comparing incident management performance against benchmarks and industry standards can provide insights into areas where further automation or process refinement is needed. Compliance and Risk Management through regulatory compliance automation can help ensure that incident reporting meets regulatory requirements and standards, thereby reducing legal and compliance risks. Risk Assessment automated incident data can feed into risk assessment processes, enabling proactive risk management strategies. Providing training on incident reporting systems and procedures ensures that staff are equipped to use automated tools

effectively. Involving frontline staff in the design and improvement of automated incident management processes increases engagement and adoption rates.

Automating the scope of incidents can be directly automated, automated if changes are made, or cannot be automated at all and steps to automate from where in the software can we automate the incident by noticing the existing product gaps and implementing high level ideas that are for the future.

Enhancing and optimizing the automation of incident management processes in hospitals requires a holistic approach that integrates technology, data-driven decision-making, staff engagement, and compliance with regulatory standards. By leveraging automation, hospitals can improve patient safety, operational efficiency, and overall quality of care. Continuous monitoring and adaptation of these automated systems will ensure they remain effective in an ever-evolving healthcare environment.

## CHAPTER 6: CONCLUSION

The Incident Management System is an effective tool for coordinating one or more humanitarian agencies responding to a major humanitarian emergency. The IMS is based on the following key points are the Incident Management System (management, operations, logistics, planning, and administration) is the ideal structure for any disaster response and the management system is expanded from the bottom to the top (“bottom-up”). As needs change, the systems expands (or contracts) as required. In conclusion, implementing an automated incident management system (IMS) at ATHMA ensures patient care, operational efficiency, and staff engagement. IMS can streamline incident reporting, improve response times, and enhance data accuracy. Ultimately, ATHMA's investment in Incident Management System stands to enhance patient outcomes, optimize resource allocation, and elevate overall hospital performance in incident management. IMS can automate incident reporting, facilitating real-time data capture and analysis. Furthermore, the systematic analysis of incident data using robust analytics tools enables IMS to identify underlying trends, root causes, and areas for continuous improvement. This data-driven approach not only enhances risk assessment capabilities but also supports evidence-based decision-making in refining hospital protocols and procedures. By establishing clear feedback loops from incident reports to actionable insights, IMS promotes a culture of continuous learning and proactive risk management among its healthcare staff.

Moreover, IMS commitment to staff engagement through comprehensive training programs and intuitive user interfaces fosters greater adoption and proficiency in using incident management systems. This engagement is pivotal in ensuring that frontline healthcare providers are equipped with the knowledge and tools necessary to effectively respond to incidents, thereby further enhancing patient care outcomes.

In conclusion, the implementation of an automated incident management system at hospital represents a strategic investment in optimizing healthcare delivery. By harnessing automation, Incident Management System not only improves operational efficiencies and resource allocation but also reinforces its commitment to patient safety and regulatory compliance.

Corrective actions are based on an adverse event that happened in the past. Preventive actions are based on thwarting an adverse event in the future. Corrective Action Preventive Actions, typically referred to as CAPA, are integral parts of our continual improvement process. The success of RCA requires careful management of the action plan. So the next stage of the RCA process is to establish a proposed action plan defining the list of corrective actions and preventive actions. The action plan should define the time frame in which the actions will be completed and who handles each task.

Root cause analysis (RCA) is a systematic approach that drills deep to identify the root cause of an incident by repeatedly asking “why” questions until no additional diagnostic responses can be provided. It typically involves an analysis or a discussion soon after an incident has occurred. An additional resource, the incident state document, serves as a written record of what happened before and during the incident, and gives answers to the questions necessary to conduct a root cause analysis. The incident state document, also known as an incident report, is the best place to start with root cause analysis. However, it is critical to dig deeper than just what the form states. RCA is conducted to determine the factors that resulted in the incident and to take corrective actions rather than to simply treat the symptoms. A successful RCA is performed systematically with conclusions backed by real evidence. Most often, there is more than just one root cause for an incident.

The most important capability of a patient related incident should be reported because it must surely be the effectiveness in reducing future harm of the kind that is being reported to it. Unfortunately, there are few places around the world where there is a powerful flow of reporting incidents that moves from identifying instances of avoidable harm, through understanding why they did or could happen, to successful and sustainable elimination of the risk for future patients.

Creating a positive environment for reporting -All reporting and learning systems, whether large or small scale, must create first a positive culture in which reports are encouraged and valued, and staff are praised for participating.

The patient safety incident reports that make visible the sources of actual and potential risk and harm in a health service heavily depends upon the observations and experience of staff that are close to the point of care. Whether they make reports will depend on many factors.

Some will be profound, such as the values and culture of their organization. Where there is an atmosphere of blame and retribution, reporting and learning will not flourish. Patients are likely to be at greater risk in such services because mistakes will not be admitted. A positive reporting environment will be nurtured if education and training have equipped staff with an understanding about how systems fail, how harm occurs in health care, and how the impact of both can be reduced. Other influences will be more technical and practical, such as how much workload pressure operating environments are under, and how easy it is to file an incident report. So, reporting must make a major contribution to revealing the risks that health care poses for patients (and health workers) in all the settings in which care is delivered. This is most likely to happen if five supporting processes are in place:

1. robust ways of identifying new and existing risks
2. clear prioritization of risks
3. mechanisms to escalate serious risks
4. methods for analyzing and investigating sources of risk
5. systematic monitoring of existing risks.

Reporting should also inform local responses to risks and drive the improvement in safety.

Five processes could support this:

- a) setting of a clear safety agenda
- b) communication of risks to relevant staff
- c) allocation of accountability for resolving risks
- d) engagement of local staff in risk analysis and improvement processes
- e) production of actionable and practical information.

Uses of incident reports are important because the information contained in, or extracted from, patient safety incident reports, sometimes added to by further information gathering or investigation, can be used for formulating action to prevent (or reduce the risk of) a similar

incident in the care setting where it occurred, to communicate information that could lead to the prevention of a similar incident elsewhere.

IMS is Ideal for hospitals seeking specialized incident management reportings, robust reporting tools, and compliance-driven workflows.

By prioritizing incident reporting through investigations, continuous improvement, and a patient centered approach, healthcare facilities can mitigate risks and enhance patient safety. Enhancing operational efficiency of automation through IMS optimizes workflows, reducing manual effort and enabling staff to focus more on patient care and less on administrative tasks. Empowering staff members by giving adequate training and user-friendly interfaces in IMS empower hospital staff to effectively utilize the integrated system, fostering a culture of proactive incident management and patient safety by creating a positive environment for reporting any kind of incident.

Ultimately, Incident Management System (IMS) stands poised to elevate its overall hospital performance and patient satisfaction through the systematic integration of advanced technology and data-driven processes in incident management.

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## **Annexure**

**Table 8.1: Overall description of the automation of incidents of each department.**

| <b>Sr.no.</b> | <b>Department</b> | <b>No. Of incidents identified</b> | <b>Automatable incidents</b> | <b>Future scope incident</b> | <b>Non-automatable incidents</b> | <b>Total days Required</b> | <b>Start Date</b> | <b>End date of survey</b> |
|---------------|-------------------|------------------------------------|------------------------------|------------------------------|----------------------------------|----------------------------|-------------------|---------------------------|
| <b>1</b>      | RIS               | 6                                  | 2                            | 4                            | 0                                | 6                          | 23-May-24         | 1 <sup>st</sup> June -24  |
| <b>2</b>      | LIS               | 13                                 | 13                           | 0                            | 0                                | 6                          | 23-May-24         | 1 <sup>st</sup> June -24  |
| <b>3</b>      | Blood Bank        | 24                                 | 12                           | 10                           | 2                                | 6                          | 23-May-24         | 1 <sup>st</sup> June -24  |
| <b>4</b>      | NAMAH             | 54                                 | 0                            | 27                           | 27                               | 5                          | 23-May-24         | 1 <sup>st</sup> June -24  |
| <b>5</b>      | OT&Anesthesia     | 47                                 | 10                           | 27                           | 10                               | 4                          | 23-May-24         | 1 <sup>st</sup> June -24  |
| <b>6</b>      | Medication        | 51                                 | 27                           | 12                           | 12                               | 5                          | 23-May-24         | 1 <sup>st</sup> June-24   |

