



THE SRI LANKA JOURNAL OF  
**MEDICAL**  
**ADMINISTRATION**

OFFICIAL PUBLICATION OF  
THE COLLEGE OF MEDICAL ADMINISTRATORS OF SRI LANKA

ISSN: 1391-2909

VOLUME 24, ISSUE I  
SEPTEMBER 2023



---

# **The Sri Lanka Journal of Medical Administration**

---

**'Rising through Challenges: Leading Towards Health System Resilience'**

**Volume 24**

**2023**

**Official Publication of the College of Medical Administrators of  
Sri Lanka**

## **Editor**

Dr Priyantha Athapattu

## **Editorial Board**

Dr SAP Gnanissara

Dr Sarath Samarage

Dr Neelamani Rajapaksha Hewageegana

Dr Sudath Dharmaratne

Dr Alan Ludowyke

Dr Priyantha Karunaratne

## **Secretariat**

Office of the College of Medical Administrators of Sri Lanka

Directorate of Health Care Quality and Safety

Castle Street Hospital for Women

Castle Street, Colombo 08.

[www.cmasl.lk](http://www.cmasl.lk)

Official Publication of the College of Medical Administrators of Sri Lanka

ISSN : 1391-2909



---

## Our Objectives

- To guide the health development in Sri Lanka.
- To assist in the implementation of national health policy.
- To promote postgraduate studies in the field of medical administration.
- To undertake health system research in the field of medical administration.
- To promote and foster professional advancement of Medical Administrators.
- To regularly review the status of Medical Administration in the country and analyse problems in the field.
- To guide the Ministry of Health and private sector on human resources development and resources mobilization in the field.
- To foster fellowship among the professionals engaged in the field of Medical Administration.
- To publish a journal of professional Medical Administration.

CONTENTS		Page
1	<b>Editorial - Strengthening Health Resilience through Medical Audits: A Pathway to Effective Medical Administration</b> <i>Athapatu P.L</i>	6
2	<b>Presidential Message</b> <i>Panapitiya Lal</i>	8
3	<b>Towards Health System Resilience beyond Boundaries</b> <i>Panapitiya L<sup>1</sup>, Samarakoon S<sup>2</sup>, Ranasinghe G S P<sup>3</sup>, Shiraj M<sup>4</sup>, Wijewikrama A<sup>5</sup>, Samarathna K<sup>6</sup>, Dr Rahulan K<sup>7</sup>, Thanreege S<sup>8</sup>, Singhprathapa K<sup>9</sup>, Gandeepan T<sup>10</sup></i>	10
4	<b>Training needs analysis for oxygen management and Emergency care</b> <i>Samarakoon M A S C<sup>1</sup>, Wanniachchi M<sup>2</sup>, Samarajeewa G<sup>3</sup>, Niyas R<sup>4</sup>, Ranathunga D<sup>5</sup></i>	22
5	<b>Distribution and Performance Evaluation of Radiology and Imaging Services in Line Ministry Hospitals in Sri Lanka</b> <i>Rathnakeerthi A<sup>1</sup>, Dolamulla S<sup>2</sup>, Panapitiya L<sup>3</sup></i>	30
6	<b>Maximum utilization of work capacity subject clerks through workload assessment and employee performance evaluation -A case study from Family Health Bureau</b> <i>Rajapaksha D.M.P.</i>	38
7	<b>Experience at Manor Hospital of Walsall Healthcare NHS Trust, United Kingdom on the application of simple tool of National Early Warning Score to reduce the Intensive Care Unit admissions.</b> <i>Pathirage I.D</i>	47
8	<b>Perspectives of Patient Engagement in Base Hospital Mirigama, Sri Lanka</b> <i>Malalasekara L.I<sup>1</sup>, Wijemanne W.M.S.U<sup>2</sup>, Mallawarachchi S.M.N<sup>3</sup>.</i>	53
9	<b>Feasibility of Implementing Cluster Laboratory System in Regional Directorate of Health Services, Gampaha district, Sri Lanka</b> <i>Jayasundara K.M.P.D<sup>1</sup>, Seneviratne Y.G.A.C.<sup>2</sup>, Dharmaratne S.K.<sup>3</sup></i>	58
10	<b>Complaint Book Grievance Management Process at District General Hospital Avissawella</b> <i>Sandanayake AP<sup>1</sup> Wellala E<sup>2</sup></i>	63
11	<b>Responsiveness in healthcare at Lanka Hospitals, Colombo: A review</b> <i>Senevirathne Y.G.A.C<sup>1</sup> Jayasundara K.M.P.D.<sup>2</sup>, Dharmarathne S.K<sup>3</sup></i>	71
12	<b>A review on the service utilization of the National Poisons Information Centre</b> <i>Attanayake H<sup>1</sup>, Wickremasinghe K<sup>2</sup></i>	74
13	<b>Feasibility Assessment of Revised Diagnosis Card to meet current issues relating to Patient Follow up</b> <i>Wijemanne W.M.U.S<sup>1</sup>, Wickremasinghe S.C<sup>1</sup></i>	84
14	<b>Novel Digital adherence Technologies for the Tuberculosis Treatment</b> <i>Ranawaka N<sup>1*</sup>, Nandasena S<sup>2</sup>, De Alwis S<sup>3</sup></i>	92

---

<b>15</b>	<b>Selected factors linked with treatment compliance among patients attending mental health clinic in National Hospital Kandy Sri Lanka</b> <i>Singhaprathapa SWMKK<sup>1</sup></i>	95
<b>15</b>	<b>Development of an Area Specific Monthly Dengue Case Target Calculator for Dengue Control in Sri Lanka</b> <i>Wijethunga WMTS<sup>1</sup> Kodituwakku KALC<sup>2</sup>, Francis GS<sup>1</sup></i>	104
<b>16</b>	<b>Assessment of Nursing Performance Management Practices in the National Hospital of Sri Lanka</b> <i>Dr Wijekoon W.M.C.R.<sup>1</sup>, Dr Wickremasinghe W.K.<sup>2</sup></i>	113
<b>17</b>	<b>Factors affecting occupational radiation safety among selected categories of staff of the National Hospital of Sri Lanka, Colombo</b> <i>Arachchi KANLK<sup>1</sup>, Dharmagunawardene D<sup>2</sup></i>	122
<b>18</b>	<b>Process improvement of fund allocations for in-service training programs at the Education, Training and Research Unit Ministry of Health Sri Lanka</b> <i>*G.S.P. Ranasinghe<sup>1</sup>, S.B. De Alwis<sup>2</sup>, P.V.D.S. Dharmagunawardene<sup>3</sup></i>	130

# **Strengthening Health Resilience through Medical Audits: A Pathway to Effective Medical Administration**

**Dr. Priyantha Athapattu, Editor, College of Medical Administrators of Sri Lanka**

In the face of ever-evolving healthcare challenges, the need for resilient health systems has become increasingly evident. As medical administrators, we have a crucial role to play in ensuring the preparedness and effectiveness of our healthcare organizations. One powerful tool at our disposal is the use of medical audits to identify areas for improvement, enhance quality, and ultimately strengthen health resilience. In this editorial, we delve into the significance of medical audits in fortifying our healthcare systems and highlight the transformative potential they hold for medical administration.

Medical audits serve as a cornerstone for building preparedness and response capabilities within healthcare organizations. By systematically reviewing processes, procedures, and outcomes, audits provide invaluable insights into the strengths and weaknesses of our systems. They help us assess the effectiveness of emergency response plans, identify gaps, and enhance coordination and communication. With the knowledge gained from audits, we can

proactively adapt our strategies to address emerging challenges, such as pandemics, natural disasters, or public health crises.

Quality improvement and patient safety are integral to resilient healthcare systems. Medical audits play a pivotal role in this regard by identifying errors, adverse events, and near misses. By uncovering these critical incidents, audits enable us to implement targeted interventions, improve clinical practices, and reduce patient harm. Through audits, we can continuously monitor and enhance the quality of healthcare services, ensuring that patient safety remains at the forefront of our efforts.

Medical audits shed light on systemic issues and inefficiencies that may hinder the smooth functioning of healthcare organizations. By analysing data and processes, audits help us identify bottlenecks in resource allocation, workflow procedures, or infrastructure. Armed with these insights, we can make evidence-based recommendations for improvement, leading to streamlined operations and enhanced

efficiency. Addressing these systemic issues not only strengthens the resilience of our healthcare systems but also improves the overall patient experience and outcomes.

As medical administrators, we recognize the importance of continuous professional development and training for our healthcare workforce. Medical audits play a vital role in this area by identifying knowledge gaps and areas for skill enhancement. By incorporating audit findings into training programs, we can foster a culture of learning, reflective practice, and evidence-based decision-making among healthcare professionals. This empowers our workforce to adapt to changing circumstances, embrace innovation, and deliver the highest quality care.

While the benefits of medical audits are undeniable, it is essential to acknowledge and address the challenges associated with their implementation. Resource constraints, data unavailability, and resistance to change are some of the hurdles we may encounter. However, by investing in capacity building, engaging stakeholders, and leveraging technology, we can overcome these challenges and maximize the impact of medical audits. Additionally, we must remain steadfast in upholding ethical

considerations, ensuring patient privacy, informed consent, and the confidentiality of data throughout the auditing process.

In the pursuit of resilient health systems, medical audits stand as a powerful tool for medical administrators. By harnessing the insights derived from audits, we can fortify our healthcare organizations, enhance preparedness, drive quality improvement, and promote patient safety. It is imperative that we embrace medical audits as an integral part of our medical administration practice, investing in their implementation, and utilizing their findings to effect positive change. Let us seize this opportunity to strengthen health resilience, ensuring that our healthcare systems are well-equipped to face the challenges of today and tomorrow.



## PRESIDENTIAL MESSAGE

### **Rising through Challenges; Leading towards Health System Resilience ('Beyond Boundaries')**

Dr. Lal Panapitiya

In the contemporary world, global health crises and challenges demand our utmost attention, it is crucial to explore the resilience of health systems beyond the boundaries. Global health systems encountered unexpected issues and challenges that have tested their strength and adaptability. The COVID-19 pandemic, in particular, has exposed the vulnerabilities of health systems and has highlighted the need for resilience that transcends geographical boundaries.

The healthcare system in Sri Lanka which has achieved numerous milestones with excellent health indicators, demonstrated its ability to withstand and manage the COVID pandemic successfully while maintaining its routine healthcare services both preventive and curative services. This resilience was evident not only during the crisis of the COVID pandemic

but also in the face of other recent challenges such as civil war, Tsunami, etc.

This was made possible due to the presence of a well-established healthcare system that offers specialized and doorstep services to individuals by healthcare professionals. These accomplishments, which include effectively managing the COVID pandemic with cost-effective services, underscore the significance of Medical Administration and leadership. Since, the healthcare domain shines as a dynamic arena, brimming with growth potential and a host of not only complex but constantly changing intricate challenges, it is the medical administrator's duty to adapt, innovate, and lead in this dynamic environment.

While appreciating the exceptional efforts of our past leaders *to navigated through troubled waters, developing health service to such standards, and establishing this esteemed college*, it's incumbent upon us today to confront impediments to *rise through challenges towards health system resilience, beyond boundaries*".

#### **College of Medical Administrators of Sri Lanka (CMASL)**

The college was formed as an Association of Medical Administrators (AMA) in 1974 and converted to the College of Medical Administrators of Sri Lanka (CMASL) in 1992 with 46 visionary leaders.

Over the years, our college has achieved the enrollment of the first batches of MSc and MD students in 1994 and 2004, respectively. Since then, we have witnessed the successful completion of 21 batches of MSc and 13 batches of MD, resulting in the emergence of 364 MSc

PG holders and 58 Board Certified Consultants in Medical Administration by year 2023 who contribute dedicated service for the betterment of the health service of the country.

#### **The country's Development and System Resilience**

As we contemplate the state of any nation, it is essential to recognize that the country's development rests on five key pillars: Health, Defense, Economy, Education, and the Judiciary system. These pillars serve as the bedrock of a nation's advancement and any disruption

in one can undermine the entire framework.

We have already witnessed the repercussions of disturbances in three of these pillars. The Defense Sector faced severe challenges due to 30 years of war and the Easter Attacks, hindering the country's development. The emergence and rapid spread of COVID-19 badly affected not only the health of citizens but also the social, and economic aspects and development of the country. Similarly, the nation witnesses the economic crisis and its outcome and impact on the health and well-being of citizens. This illustrates the interconnectedness and interdependence of these pillars, highlighting the critical importance of establishing resilient systems. Therefore, it is the duty of medical administrators to cultivate, safeguard, and sustain the resilience of all these aspects effectively.

### **Attributes of Health System Resilience**

Resilience is defined as the preparedness of

### **Building a Resilient Health System**

To build health system resilience, strategies have been developed based on the health system building blocks. These strategies include,

- Improved service delivery (Safe, Quality, Productive, Customer Focused) through innovative system development based on learning through past experience.
- Improved access to essential resources and services; medicines, vaccines, and technologies
- Commitment to health equity and social justice
- Community Empowerment and engagement
- Strengthened health workforce.
- Health information systems with improved surveillance systems
- Sustainable health system financing
- Empowered leadership and Improved Governance

a system and capacity to respond to a shock which is any known or unknown, sudden, and extreme changes in the environment. organization which impacts a system. The type, severity, and duration of the shock determine its effect on system performance and level of impact. Attributes of Health System Resilience are;

- ✧ Preparedness to absorb and adapt to shocks.
- ✧ Effective response to challenges and changes at different levels
- ✧ Adaptation and transformation through learning from past experiences
- ✧ Continuously providing critical functions and essential services
- ✧ A focus on delivering high-quality care services under varying conditions.

Resilience means not just withstanding shocks but also adapting and even transforming to a better state than earlier in response to changes.

Essential to a resilient healthcare system is the building of essential resources. Medical Technology Assessment together with resource mapping guides the way to the proper distribution and utilization of resources and services efficiently. Innovative system development based on learning through past experience for Safe, Quality, Productive, customer-focused service delivery is a must. A motivated and skilled health workforce is the cornerstone of success, not only during crises but also in preparedness and management. Accurate and timely information systems, integrated with alert mechanisms, are vital for early detection of emerging health threats.

Ensuring sustainable financing mechanisms, including resource pooling and alternative sources such as social health insurance and earmarked tax

system need to be explored. In addition, new avenues for income generation mechanisms, such as manufacturing medicines for exports, medical tourism, and education tourism should be considered. Our efforts must prioritize health equity and social justice, empowering and engaging communities in their health needs is an essential path for resilience. Empowered visionary leadership and improved governance underpin the success of all these strategies.

The country has a rich history of resilience and boundless experience in health system resilience, which is very much limited in the region and other parts of the world. The health system faced challenges, survived, and thrived in the past. Hence, health managers have to shift their focus beyond planning and implementing interventions to ensure that the healthcare system exhibits resilience when facing unforeseen circumstances.

Embracing new perspectives, such as International Collaboration (Breaking down silos, thinking, and collaborating across units, sectors, and ministries), Beyond Boundaries (collaboratively managing innovative alternatives and

expanding into the international arena), Teamwork (prioritizing team performance over individual achievements) will not elevate our profession within the healthcare sector but also extends its impact beyond these boundaries.

Presently, we are confronted with formidable challenges in delivering healthcare services, including the provision of essential medicine, laboratory services, brain drain of the health workforce, and financial hardship. On top of that, the risk of CBRNE (Chemical, Biological, Radiological, Nuclear, and yield Explosives) hazard is a major concern in the global context. Natural disasters build on additional risk to the health sector. These limitless obstacles hinder us from moving forward in our motherland as a whole.

As health professionals of the current era, we are at a crucial juncture where we need to make decisions like, “Now OR Never” considering all the above obstacles. *“Again, we struggled, we are surviving now, and we will definitely thrive soon as a country, that’s how the history says”*. But, we should not overlook the opportunity to sustain this time, for the betterment of the future generation.

***“The greatest threat to our society is the belief that someone else will save our country”.***

It is high time to call upon all the sectors of the nation, beyond the boundaries towards the common goal, **“One Country, One Health”** for the sake of our motherland and citizens, during this challenging period. Please remember that past success is the future killer. Think differently, act differently, and achieve differently since crisis, always a good opportunity for a good leader to create new future.

## **Towards Health System Resilience beyond Boundaries**

*Panapitiya L, Samarakoon S, Ranasinghe G S P, Shiraj M, Wijewikrama A, Samarathna K, Rahulan K, Thanreege S, Singhapathapa K, Gandeepan T*

### **Introduction**

COVID – 19 pandemic emphasized critical importance of building resilient health systems with capacity to withstand and respond to crises. Though it is strange to all health systems globally, Sri Lankan health system was able to face the pandemic successfully while maintaining its routine health care services, both preventive and curative. Health service of the country was able to withstand and manage the services smoothly and successfully not only in COVID pandemic but also during other recent crisis situations such as civil war, Tsunami etc., proving the resilience nature of our health system. However, western medicine allopathic system is considered to be the main player, and other systems being operated in the country such as Ayurvedic Unani Siddha and Homeopathy, have contributed to health system resilience especially in a crisis situation. COVID Pandemic has directed all countries globally to make their health systems better prepared for resilience against all forms of threats. This is much focused for securing health for all, assuring Universal Health Coverage and achieving the health-related Sustainable Development Goals.

Double Burden of Non-Communicable Diseases (NCDs) including Cancers, Chronic Kidney Disease (CKD) as well as emerging and currently affecting Communicable

Diseases, Epidemiological transition and Demographic Transition with more aging population, unplanned urbanization etc., are the usual challenges being considered for decades.

Among this routine, some new challenges occurring in this new volatile era such as, economic uncertainty, changing geopolitics, global warming as well as new epidemics & pandemics etc., which force national leaders and policymakers to make their health system resilient to face these challenges as their number one priority and responsibility while all other planned developments are taking place. The risk and frequency of shocks or crisis would appear to be increasing globally. Hence, this novel concept, Health System Resilience, is now, been emphasized all over the world.

### **Resilience and Health System Resilience**

Resilience means the preparedness of a system and capacity to respond to a shock, which is known or unknown, sudden, and extreme changes in environment of organization, which impacts on any system (National Research Council, 2012). Resilience in relation to health is described as Health System Resilience. It is important to note that facing a shock does not merely develop the health system as resilient. Developing system resilience with preparation for a future shock will definitely improve the system inherently linking with

universal health coverage and individual health security (protection against risk), though expected shock may not necessarily happen (OECD, 2023). It is different to a shock from a predictable and enduring health system stress, such as population ageing, increasing incidence of multimorbidity. Type, severity, and duration of the shock determine its effect to system performance, level of impact of the shock, how much resilience is needed to deal it (OECD, 2023). The type and severity of the shock, stage in the shock cycle, and the particular country context, decide the nature and level of strategic response (Thomas *et al.*, 2020).

Health System Resilience is defined as “The ability to effectively prepare for, withstand & manage the stress (absorb, adapt and transform) and respond to the health consequences of shock and learn from shocks focusing on a system of more prepared and better performing” (Kutzin & Sparkes, 2016), and also defined as “the proactive ability / capacity that organisations, units, teams and individuals enact to quickly adapt to any known or unknown changes and sudden shocks or crises in environment, in every day practices through holistic implementation of risk management, contingency, and continuity planning, rather than to resist them”.

A Resilient Health System is with the qualities prepared with capacity to absorb &

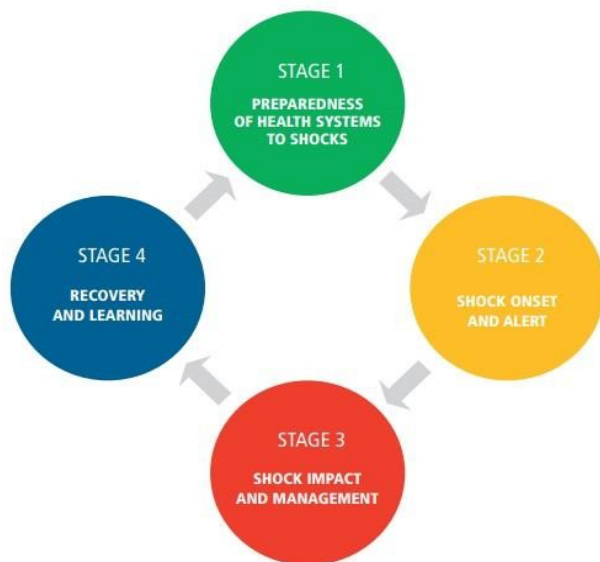
adapt and maintaining provision of critical functions & essential services even within a crisis as well as focusing to deliver high quality care services across varying conditions.

Shocks affect predominantly on balance between demand and supply of services and resources of health systems (Thomas *et al.*, 2020; Sagan *et al.*, 2022). The issues we experienced during the COVID – 19 pandemic were preparing for infrastructure and system for management for newly identified disease while managing & maintaining routine health care both in curative and preventive care and attend to safety, wellbeing and capacity of staff, facing to financial constraints and other straining resources, mostly disrupting the medical supply chain, also to attending to relieve unrest of staff & public especially to the vulnerable population categories (Sagan *et al.*, 2021; Binagwaho, Hirwe and Mathewos, 2022). Because of these issues, organizational performance in shock, from the onset of a crisis / shock is regressed. However, with proper absorption and adaptation, it will again be rising not merely to previous status but even transforming into better status depending on management dedication and ability of managers. Hence, management of shock in a methodical way is of utmost importance and is described as a cycle in this diagram below.

## Shock management as a cycle (Thomas *et al.*, 2020)

### Stage 1: Preparedness.

Preparedness of health systems to future shocks. Identifying vulnerable sectors / areas, preparing to get ready for shocks before they happen, analysing to identify optimal responses to strengthen health system consolidating existing resources.



Source: (Thomas *et al.*, 2020)

### Stage 2: Shock onset and alert

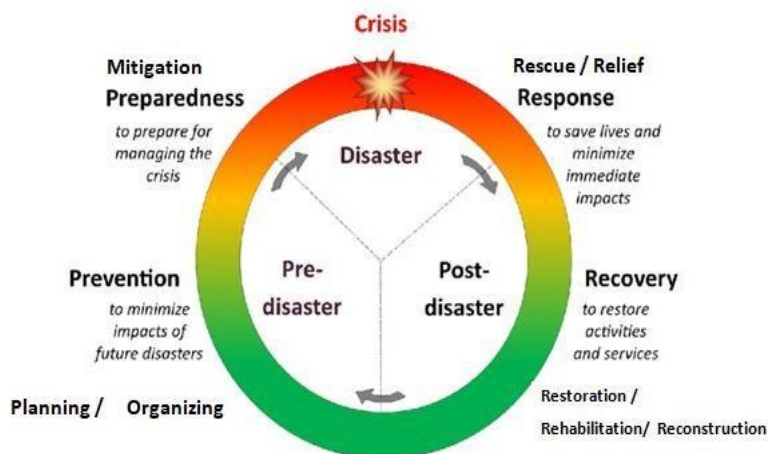
Timely identification of onset and type of shock. A system of comprehensive surveillance and early warning systems for faster and more effective response with Information flow; timely, complete, regular, and good-quality information & broad range of indicators (National + International) as well as triggered epidemiological investigations (Thomas *et al.*, 2020).

### Stage 3: Shock management and impact management (on System & Society)

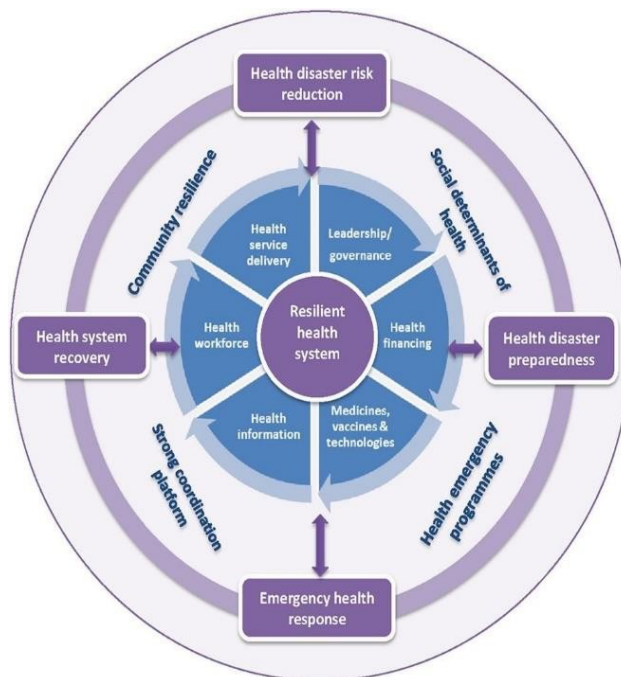
Shock absorbs, adapts, transforms, and ensuring to achieve health system goals. Absorption is incurring the system shock but protecting health system from profound resource imbalance by making available additional resources (from reserves or contingency funds, planning for cost reduction and other source of funds). Adaptation requires absorbing the additional demand or reduced supply or adapting delivery within the system by making the system more efficient (i.e., 'doing more with less') more rational and efficient use of existing services. Transform is to cope with the impact of the shock (Thomas *et al.*, 2020).

### Stage 4: Recovery and learning,

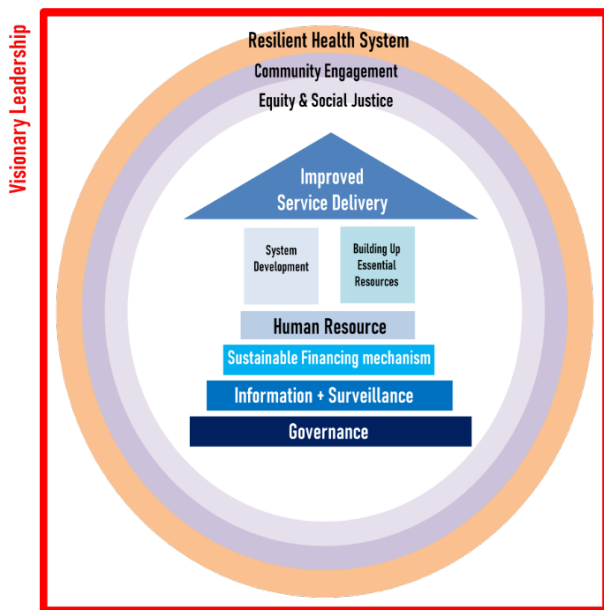
Return to some kind of normality but changes being continued as a legacy of the shock. Useful learning from the shock experience and its management is needed not only for improving the current system but also better handling of any future similar shock scenarios since any crisis can create another crisis. Returning to new normalcy towards ending of shock is not like the old since significant changes to the system may be needed to address the outcome / impact of the shock. Changes in institutions; organizational culture, systems, individuals as well as in community may need for resilience and ultimately leaders can get this opportunity to transform the organizations. It is almost like Disaster Management Cycle, which is displayed below (Thomas *et al.*, 2020).



Source: POLICY BRIEF 36, Strengthening health systems resilience, Key concepts and strategies (Thomas *et al.*, 2020)



Source: POLICY BRIEF 36, Strengthening health systems resilience, Key concepts, and strategies (Thomas *et al.*, 2020)



Source: Researcher's original work, 2023

### Strategies to overcome current issues towards Health System Resilience in Sri Lanka

Considering the above, strategies have been developed based on WHO identified Health System Building Blocks.

- Improved service delivery (Safe, Quality, Productive, Customer Focused)
- Improved access to essential medical products, vaccines, and technologies
- Strengthened health workforce.
- Health information systems (improved surveillance systems)
- Sustainable health system financing
- Empowered leadership and improved governance

In order to improve service delivery, it is necessary to develop the system as well as to build up essential resources that means improved access to resources and services. Success of all these strategies requires empowered visionary leadership with shared vision. Responsibility of leaders is to achieve the good governance and directing all stakeholders into a common goal; whole of society approach - One Country - One Health.

**1. Improved service delivery: safe, quality, productive, customer focused service in health system with alternative and flexible approaches to deliver care and improved access to essential medical products, vaccines and technologies.**

Considering resilience, service delivery is to be strengthened both in preventive and curative sectors together with improvement of healthcare infrastructure, medical equipment, and trained healthcare professional with satisfactory skill mix in

order to provide essential curative health services as well as successful public health to the population. With regards to quality and safety, Ministry of Health has established quality management units in all hospitals and initiated an accreditation programme. Measures such as assessing and monitoring with defined quality indicators and clinical audits, implementing protocols and management guidelines, introducing safety check list, and online tools for incident reporting and other patient safety measures are to be expanded more in future. These have been focused for clinical governance and High Reliable Organizations (HRO).

Success for current resilient that has been proven in past crisis is mainly contributed by the coverage and accessibility of health service, which has been achieved with scattered institutional networks all over the country in both preventive and curative





aspects connected with good road network and successful transport service. Health literacy contributes for good health seeking behaviour and compliance, which was mainly an impact of free education policy. Health Service affordability is achieved through Free Health & Free Medicine policy.

**Healthcare system development** is achieved especially through introduction of new technologies and innovations, improving

efficiency by optimizing processes and workflows, balancing disrupted supply and demand and with the ability and capacity to cope up the demand in a sudden surge. Reforms that are services focusing to optimize care delivery based on Health Technology Assessment, which can help identify cost-effective, cost benefit interventions balancing allocative and technical efficiency, improving the efficiency and effectiveness (productivity) are needed.

**Table 1. Health Development objectives and activities**

Objective	Activity
More productive Healthcare Delivery with reforms based on Health Technology Assessment	<ul style="list-style-type: none"> <li>• Improving Primary Care Services</li> <li>• Reorganizing the Care Pathways – step down hospitals</li> <li>• Family Medical clinics</li> <li>• Healthcare Quality and Patient Safety - towards HRO</li> </ul>
New technology and innovations	<ul style="list-style-type: none"> <li>• Home based care.</li> <li>• Oxygen management app</li> <li>• Telemedicine</li> <li>• Help Desk (Service e Information portal)</li> <li>• IT solutions</li> <li>• Online Inquiry system (TEC Connect, MS connect) Etc.</li> </ul>
Improved efficiency	<ul style="list-style-type: none"> <li>• Optimizing processes and workflows balancing disrupted supply and demand</li> <li>• Rearranging care pathways</li> </ul>

During the past crisis, some of innovative alternative and flexible approaches to deliver care were decentralization of follow up of non-complicated patients to peripheral PHC level with necessary investigation facility and medicines, mobile clinics for follow up

patients. Home Based Care with call centre facilities to manage uncomplicated patients at the comfort of their home but under medical officers and consultants’ supervision. Telemedicine and Tele consultation and home visit mechanism (Community based

system) step down concept with support of underutilized PHC institutions, more effective involvement of general practitioners. Our domiciliary health workers, then revitalization of PHC level system for efficient cost-effective service-better access to quality health care (Universal Health Coverage-UHC) and more rational and efficient use of existing services. This will be a more sustainable solution even for current and future crisis reducing workload to Secondary Care and Tertiary Care and improving customer satisfaction. Integrated PHC towards achieving UHC with newly organized care pathways through introducing Referral Back Referral mechanism, Essential Service Package, Shared Care Cluster, comprehensive holistic care with empanelled Family Medical Clinics with a database of population screened in Healthy Life Clinics, day stations for elderly patients, Step Down hospital model for suitable stroke, orthopaedic or chronic patients coupled with community base rehabilitation and distantly monitored Home Based care, Consultant services through Telemedicine, improved integrated Emergency Care Management.

It is proposed to plan and develop necessary service facilities such as Isolation centres, Emergency Unit in strengthened PHC institutions with telemedicine facilities, Chemical, Biological, Radiological, Nuclear, and Explosive (CBRNE) training based on with disaster management plans for each hospital etc. These will enhance the ability and capacity to cope up the demand in a sudden surge; balancing supply and demands in services and resources. Innovative interventions during pandemic crisis times

such as home-based care with community / home visits, Oxygen assessment digital tools /Mobile app, PHC improvement with identified strategies, telemedicine, online inquiry system (TCS Connect, MS connect) are still valid and suitable to be continued. Importance of building up essential resources and infrastructure through improving access to essential medicines, medical products, resources, and technologies is critical for providing quality healthcare to all individuals, regardless of their location or socio-economic status.

In a resilient system, ensuring adequate supply of resources, both human and physical with minimized waste and maximized use of available resources and distributed appropriately based on norms developed according to the level and to comprehensive service package with a focus of effective delivery of services is essential.

## **2. Strengthened health workforce.**

Motivated, flexible, and well-supported workforce with right skill mix that rationally distributed based on appropriate norms and cadre is an asset to health service and to be a critical element of system preparedness, which allows adaptability in response to any shock. Also, important to note following.

- Appropriate norms and distribution of human resources with the right skill mix ensuring right number of healthcare workers in the right places with the right skills to provide quality care to patients.

- Clinical update and capacity building with positive attitudes to match with current need and demand will empower healthcare workers to perform their roles effectively and with confidence and in a culture of continuous learning and improvement.
- Motivated health workforce is achieved through appreciation, grievance handling mechanisms, incentives, insurance, and other welfare benefits. By recognizing their hard work and providing them with the necessary support, we can help to keep them motivated and committed to their work.

### **Commitment to health equity and social justice**

Ensuring health equity and social justice is much important considering system resilience. Health equity means that everyone could achieve their full health potential, regardless of their background or circumstances. Social justice is about creating a fair and just society where everyone has equal access to the resources needed to live healthy and fulfilling life needs. Ensuring quality and safe healthcare services delivery is accessible and affordable to everyone including vulnerable population, especially during times of crisis with comprehensive health coverage ensuring appropriate level and distribution of human and physical resources and but also important to address social determinants of health which can impact on outcomes of health such as food, water, housing, education etc. Strengthened Social Care Services like

the developed countries also have a greater impact on public. Finally, it is necessary to ensure matching with health security demands of marginalized and vulnerable populations with a special focus on correct pre-existing inequities.

### **Community engagement and empowerment.**

Empowering communities to be proactive and responsible for their own health, needs and challenges and community engagement also helps to build trust and stewardship in health systems and improves the uptake of healthcare services. Communities have a unique perspective on their health needs and challenges and involving them in decision-making processes can lead to more effective and sustainable solutions.

### **3. Sustainable health system financing mechanism**

Without having a sustainable health system financing mechanism, it is not realistic to address many of other strategies. While ensuring stable sufficient monetary resources and reserves in the system, flexibility to reallocate and inject extra funds must be focused to meet changing needs for ensured supply chain. In a crisis, other than usual way of financing which is collection, pooling, allocation and distribution, there should be alternative ways of financing such as health insurance for health worker, contingency fund, National Health fund, taxation on tobacco and alcohol for emergency fund, and revenue generation through Medical Tourism and Educational Tourism are some suggestions for financing on resilience.

It was an opportunity for us to eye open for improving our finance mechanism on free health and free medicine; cost reduction through price regulations for service and medical items, efficiency improving (rationalizing lab and other diagnostic facility usage and rationalizing prescription patterns etc), reorganizing care pathways, home based care, Tele Medicine, community-based care in parallel to PHC improvement. New ways of revenue generation through Local manufacturing including for export, Medical Tourism, Educational Tourism, are alternative financing sources. The Social Health Insurance, Social Security System, National Health fund, taxation on tobacco and alcohol diverted for Contingency Fund, etc., and above-mentioned strategies are some suggestions for self-sufficiency towards financing resilience.

#### **4. Effective Health information systems and improved surveillance systems**

Accurate and timely information systems, and efficient flow of information in Health Information Systems together with a culture of sharing critical information with stakeholders is vital for rapidly transforming into useful information for effective decision-making and response planning in any policy process. A good integration of surveillance mechanisms, including alert mechanisms, clinical and laboratory services, survey results, data on resources, evidence synthesis on survey results and communication activities, is important to address emerging health threats, and investing in research and development is also essential in data gathering. Inefficient or absence of information system hinders the ability of countries to timely detect the onset of a shock

and provide timely meaningful information for management.

During COVID era, we had an effective surveillance system timely identifying threats and notifying. Incorporation of ICT for greater social outreach should be done developing a platform for service information for public. There were many interventions with IT solutions to improve Medical Information System such as, Dash boards for COVID management, Health Information Unit for COVID patients' statistics and surge capacity on preparedness, ICU Bed Surveillance system, Oxygen app to assess institutional availability and usage, Safe environment to assess and guide the safe environment, Health Net for mapping of resource, Equipment inventory management system. There were online training platforms, Hotlines for patient advice and consultation etc., and all these strategies helped in information for health system resilience.

#### **5. Empowered leadership and improved governance.**

Strong leadership with shared vision and effective communication is the main pillar to underpin many of the other factors that determine resilience such as deploying financial reserves and coordinating in mobilizing all available resources to organize and maintain service delivery, motivating a stretched workforce, developing teamwork etc. Leaders with participatory approach achieve success in rapid effective implementation of strategies identified on public health measures and health system operations through effective coordination and collaboration between all stakeholders aligning their priorities towards a common goal as well as in effective advocacy in

demonstrating crucial role of the health system. It was apparent during COVID-19 pandemic how successfully our health system developed resilience by the leaders at all levels institutions, wards, units.

Leadership with good reputation is essential for good governance where all, institutions, government, staff, public are to be accountable and transparent. Governance is another main contributing factor for resilience of which main features to be maintained are the Accountability, Transparency, Participation Integrity, and Stewardship. Not only the leaders but also all institutions, government, staff, public are to be accountable and transparent for good governance. Collaboration and coordination of activities across relevant sectors, non-government stakeholders, international institutions, development partners, interconnected government sectors in different levels who have responsibility for social dominants of health, such as food, water, housing, transport, and energy etc. are essential for resilience of the system through teamwork beyond boundaries and compartments. Leaders' role is to direct all stakeholders towards whole-of-society approach, where everyone working together towards a shared goal of promoting and protecting and health for all assuring health equity and social justice as a One Country One Health.

Success story of managing COVID 19 Pandemic was one example of the importance of medical leadership, and it was a lesson on strategic management how service delivery was planned and how human resource was managed. Developing system and improving infrastructure with medical and safety

equipment and other medical supplies for management of COVID while maintaining routine patient care, educating, and mobilizing of health staff and maintaining their safety etc. Identifying suitable care levels in each wave and innovative solutions such as Home-Based Care with a call centre, Step Down Centres, establishing Intermediate Care Centres through conversion of non-health centres, such as training centres, hotels etc. were other measures.

To manage high influx of patients, hotlines for patient advice and consultation etc., were some innovations done. All those cost-effective solutions were focused for minimum possible compromise to routine patient care and best possible care for COVID patients with medical staff cover and a bed for all indoor patients.

Strategies and measures taken on Oxygen management without any crisis, ICU development and management, COVID patient mobilization and isolation are other success stories. During all crisis, factors behind the success in management were experts support, dedication of all staff from consultant to lower-level health worker in a team effort and coordination of all health non-health stakeholders, armed forces, and development partners as well.

### **Organizational learning culture**

In the face of crises such as pandemics, we need organizations that are adaptable, resilient, and capable of learning from both successes and failures throughout the shock cycle. Organizational learning culture should have attitude for learning, and to facilitate to be responsive to crises, which builds more

resilience with experience of learning, and adaptation through timely use of evidence and timely Identifying pre-existing health system weaknesses, correcting negative impact of recession on people for better service transformation in all areas. It is vital for learning from successes and failures to ensure more effective responses throughout the entire shock cycle.

### **Leadership in Resilience for future crisis**

It is the responsibility of leaders to identify early signs of future shocks or crisis and make the system prepare. In Sri Lanka, not only COVID, our leadership has expressed their capability and our health system capability for health systems resilience with many evidence in Tsunami disaster management, civil war period and in other disasters. Managing the crisis, while maintaining routine patient care through diverting mobilizing our resources including Human Resource was the success of leadership. Also, to face future disasters / crisis, it was proposed to planned and develop necessary service facilities such as Isolation centres, Emergency unit in strengthened PHC with telemedicine facilities as well as for any future disasters with CBRN training of staff together with disaster management plans for each hospital etc.

### **Sri Lankan Health system as resilient system**

As the positive side of COVID pandemic, we had the opportunity to identify our system gaps and initiate to make more efficient, more resilient solutions to cope up the crisis and maintain care during the crisis. Some of innovative alternative and flexible approaches introduced and managed during

pandemic period were decentralization of follow up of non-complicated patients to peripheries, strengthening PHC level with necessary investigation facilities and medicines, mobile NCD follow up clinics, Home Based Care with call centre facilities to manage uncomplicated patients at the comfort of their home but under medical officers and consultants supervision, introduction of Telemedicine and Teleconsultation, home visit mechanism (Community based system), step down concept with support of underutilized PHC institutions, more involvement of general practitioners and our domiciliary health workers etc.

For future, this will be a more sustainable solution even for current and future crisis with improved Emergency Medicine, empanelled Family Medicine clinics with Healthy Lifestyle Centres (HLC) Centres for screening, step down for stroke patients, day stations for elderly patients, as well as centre for community-based rehabilitations. These will enhance the ability and capacity to cope up the demand in a sudden surge; balancing supply and demands in services and resources. During COVID crisis, with assistance of development partners, donors and well-wishers as well as through government funds, we were able to improve hospital infrastructure, ward, ICU, & HDU equipment, Oxygen outlets, generators and improving storage capacities as well as infrastructure for Molecular Medicine system making our system more resilient.

Factors such as island wide preventive institutional network and curative care network, health service provided to doorstep by domiciliary health workers and their

dedication, free health and free medicine policy, other developed infrastructure such as road network and transport, general administration network, forces and police network etc., have made our system resilient to a satisfactory level which entertained in health service management during not only in COVID – 19 pandemic but also in war, Tsunami crisis as well.

## References

1. Binagwaho, A., Hirwe, D. and Mathewos, K. (2022) ‘Health System Resilience: Withstanding Shocks and Maintaining Progress’, *Global Health Science and Practice*. Johns Hopkins University Press. doi: 10.9745/GHSP-D-22-00076.
2. National Research Council (2012) *Disaster resilience: A national imperative, Disaster Resilience: A National Imperative*. National Academies Press. doi: 10.17226/13457.
3. OECD (2023) *Health Systems Resilience - OECD*. Available at: <https://www.oecd.org/health/health-systems-resilience.htm> (Accessed: 31 August 2023).
4. Sagan, A. *et al.* (2021) ‘Health systems resilience during COVID-19: Lessons for building back better’, *European Journal of Public Health*, 31(Supplement\_3). doi: 10.1093/eurpub/ckab164.285
5. Sagan, A. *et al.* (2022) ‘Strengthening Health System Resilience in the COVID-19 Era’, *Eurohealth*, 28(1), pp. 4–8.
6. Sagan, A. *et al.* (2023) ‘Assessing resilience of a health system is difficult but necessary to prepare for the next crisis’, *BMJ (Clinical research ed.)*, 382, p. e073721. doi: 10.1136/bmj-2022-073721.
7. Thomas, S. *et al.* (2020) ‘Strengthening health systems resilience, Key concepts and strategies. European Observatory of Health Systems and Policies.’, *Who*, p. 33. Available at: [https://apps.who.int/iris/handle/10665/332441%0Ahttps://apps.who.int/iris/bitstream/handle/10665/332441/Policy-brief 36-1997-8073-eng.pdf](https://apps.who.int/iris/handle/10665/332441%0Ahttps://apps.who.int/iris/bitstream/handle/10665/332441/Policy-brief%2036-1997-8073-eng.pdf).

## Conclusion

Only way is to rise through challenges Medical Leadership with its teams should focus to achieve good governance with transparency and accountability through coordination beyond boundaries and beyond compartments, and paradigm shifts beyond frameworks with innovative solutions is the way towards health system resilience.

# Training needs analysis for oxygen management and Emergency care

*Samarakoon M A S C, Wanniachchi M, Samarajeewa G, Niyas R, Ranathunga D*

## Abstract

Training Needs Analysis (TNA) provides information about the current employee efficiency level, the skill areas most in need of development and the ways in which this might best be achieved.

A series of training programs were scheduled to be conducted by the Sri Lanka College of Emergency Physicians to improve oxygen management and emergency care. It includes theoretical knowledge and skill building for emergency care, treating hypoxemia patients, and managing COVID19.

All medical and nursing officers currently performing emergency care-related activities in the country are the program's target audience. To determine which specialist areas should receive training first, a training need assessment (TNA) was done.

Hennessy-Hicks Training Needs Analysis Questionnaire is the basis for TNA. A specific online questionnaire was completed by 67 nurses and 53 doctors from hospitals that were recognized.

Gap of everyone's response to each questionnaire set (competency related to a topic/importance related to the same topic) was calculated manually, using the formula in excel (**'Gap Score'**). Average of Competency Scores for each Topic was calculated using formula and ranking of the topics was done based on the average competency scores.

The topic of "Emergency childbirth" has received the highest attention from both medical officers and nursing officers.

## 1. Introduction.

For all medical and nursing officers currently engaged in emergency care-related duties Island-wide, the College of Emergency Physicians plans to conduct a series of training programs covering theoretical and skills development related to emergency care, management of hypoxemia patients, and management of COVID19. The outcomes of the Training Needs Assessment will guide the selection of the training's modules (topics). To guide this project, a steering committee at the Ministry of Health was formed comprising representatives from FHI 360, emergency care physicians, and nursing.

## Objective of the TNA:

Based on their competence in each designated area and their own interests (importance), the objective is to ascertain the necessity for pertinent training Modules (Topics) to be included in the training manual for the training on Emergency Care and COVID-19 Management for doctors and nurses.

An online survey was used to gather the data, but no personal information was disclosed to the public. The same questionnaire was distributed to doctors and nurses, with a few questions on their roles in the workplace being slightly different. While identifying the indicated Modules (Topics) is the primary objective of this study, other training areas suggested



by the participants are also included. This report includes the questionnaire's results as well as some specific recommendations that will help in deciding which important Modules (Topics) should be covered in each training session for doctors and nurses as well as in upcoming courses on emergency care and COVID-19 management.

## **2. Scope and Methodology**

The College of Emergency Physicians, Sri Lanka, conducted a Training Needs Assessment (TNA) exercise, the results of which are analysed in this report. The team created a customized online survey with Google Forms. The questionnaire was initially shared with the identified subject-matter experts to get feedback and additions before being amended. The questionnaire was made up of a total of 13 questions, which were separated into two primary sections: competency and importance (interest) on Modules (Topics) in the context of emergency treatment. Questionnaire for doctors & nurses comprised of different 13 Modules (Topics). Basic demographic information (type of hospital working, years of experience, and previous training attended) was also gathered in addition to the questionnaires. Questionnaire is attached in *Annex 1 and 11*.

The questions were designed to gauge each respondent's present level of skill with relation to the Modules (Topics) and their level of importance (interest) in these Modules (Topics) for training. Please list any other training areas that are necessary.

Also requested to mention any additional training areas that are required. The online questionnaire was disseminated through

previously contacted persons via main related health institutions.

It should be emphasized that the Training Needs Assessment data has certain limitations because there weren't many responders and there wasn't sufficient time to complete it. Overall, 67 nurses and 53 doctors completed the online survey.

The Hennessy-Hicks Training Needs Analysis (TNA) survey is one of the most widely used validated instruments. The technology, which has received the World Health Organization's endorsement, aids in the design of personalized training to achieve professional development goals. (Markaki et al., 2021)

Training needs have been identified where there are the greatest differences between the significance attributed to a topic or item and how well a person believes they know the subject or have the necessary skills. The most significant gaps indicate the greatest need for training. This can be done for a group or a single person. Because you might notice a requirement for training for an activity that isn't seen as being incredibly significant, it's imperative to keep in mind the level of importance that has been allocated to each individual item; for example, an item might be given a 4 for importance but only a 1 for performance. This would indicate a training requirement, but not one that is urgent, given the task's assessed priority. (Arora, n.d.)

## **3. Data analysis**

The analysis of the data was divided into two components. Separate analyses were conducted on the responses of 67 nursing officers and 53 medical officers.

### A. Analysis of basic demographic data

Basic information collected through the disseminated questionnaire (working hospital, years of experience in emergency service) was analysed and explained through pie charts as percentages.

**B. Analysis of questionnaire responses**

Questionnaire was focused on two main items (Competency & Importance) and rated in 1-5 Likert Scale.

Rating of competency provides an index of *what extent* each individual think that he or she has the skill, while Rating of importance provides an index of *how important* the skill to the successful performance of his/her job. Comparing the scores for status of competency /status of importance of the skills provides an assessment of where the greatest training needs lie. The *greater the difference in scores, the greater the training need*

**Table-1 Prioritization of 13 Topics on competency and importance (Medical Officers/Nurses)**

Competency 1- Very poor, 5- Very competent		Importance 1- Very poor, 5- Very competent	
Medical Officers	Nurses	Medical officers	Nurses
Drowning and electrocution	Poisoning or overdosed	Drowning and electrocution	Poisoning or overdosed
Advance life support	Blood gas interpretation	Advance life support	Blood gas interpretation
Advance Pediatric Life Support	Advance Pediatric Life Support	Advance Pediatric Life Support	Advance Pediatric Life Support
Basic Trauma Care	Basic Trauma Care	Basic Trauma Care	Basic Trauma Care
Snake Bite	Snake Bite	Snake Bite	Snake Bite
Patient with Arrhythmia	Patient with Arrhythmia	Patient with Arrhythmia	Patient with Arrhythmia
Patient with chest pain	Patient with chest pain	Patient with chest pain	Patient with chest pain
Patient with SOB	Patient with SOB	Patient with SOB	Patient with SOB
Patient with reduced consciousness	Advance life support	Patient with reduced consciousness	Advance life support
Non-invasive ventilation	Non-invasive ventilation	Non-invasive ventilation	Non-invasive ventilation
Basic invasive ventilation	Basic invasive ventilation	Basic invasive ventilation	Basic invasive ventilation
Basic USS skills	Patient with reduced consciousness	Basic USS skills	Patient with reduced consciousness
Emergency childbirth	Emergency childbirth	Emergency childbirth	Emergency childbirth

Responses of both medical officers and nurses were transferred and analysed in two separate spreadsheets. Gap of everyone's response to each questionnaire set (competency related to a topic/importance related to the same topic) was calculated manually, using the formula in excel ('Gap Score')

When the gap is 0 or -1, -2, -3 or -4, it means there is no training need for the individuals

on those topics. Therefore, responses of the individuals with a gap score of 0 or - scores were taken out from the analysis.

Gap score +4 ----->Maximum training need

Gap score +1 -----> Minimum training need

'Gap Scores' & 'Competency' for each Topic rated by all respondents were

transferred into a new spreadsheet. Average of Competency Scores for each Topic was calculated using formula. Further analysis is based on average competency scores and therefore, average competency score for each topic was compiled in a separate sheet.

The topic with the lowest average competency score should be the most important for the training, while the topic

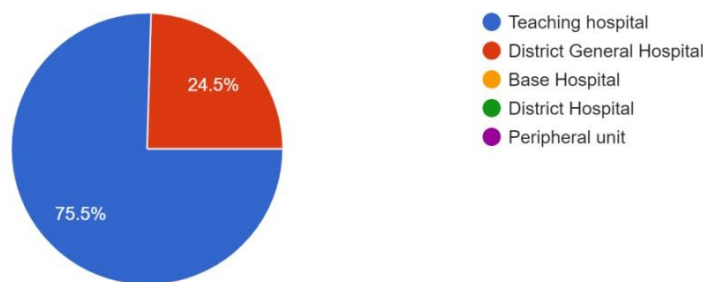
with the highest average competency score should be the least important, according to the 1–5 Likert Scale. The training needs were then ranked and prioritized using these average scores, which were then ordered in ascending order.

#### 4. Results- TNA of Medical Officers

##### A. Basic demographic data

##### Type of hospital

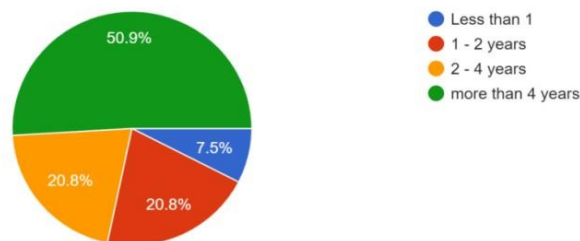
What is the level of hospital you are working?  
53 responses



The majority of the doctors who participated in the survey (75.5%) came from Teaching Hospitals, while 24.5% came from district general hospitals. These doctors are better suited because they are employed by emergency care institutions as consultants and participate in emergencies while they are at work.

##### Years of experience in emergency service

Years of experience  
53 responses



Around 50 percent (50.9%) of the physicians reported having worked in emergency care settings for more than 4 years. Only 7.5% of respondents reported having less than a year's

experience in the emergency care industry. Both groups of experience levels—1-2 years and 2-4 years—revealed the same number (20.8%).

## B. Questionnaire responses

**Table-2 Ranking of Topics based on average competency scores**

	Topic	Average Competency	Rank
13	Emergency childbirth	2.51	1
3	Advance Pediatric Life Support	2.67	2
12	Basic USS skills	2.68	3
11	Basic invasive ventilation	2.96	4
6	Patient with Arrhythmia	2.97	5
1	Drowning and electrocution	3.09	6
9	Patient with reduced consciousness	3.10	7
10	Non-invasive ventilation	3.12	8
5	Snake Bite	3.13	9
8	Patient with SOB	3.22	10
4	Basic Trauma Care	3.25	11
7	Patient with chest pain	3.25	11
2	Advance life support	3.26	13

The TNA of Medical Officers' results showed that "Emergency childbirth" is the training topic with the highest importance, while "Advanced life support" had the lowest priority. 'Basic trauma care' and 'Patient with chest pain' were given the same priority level (11).

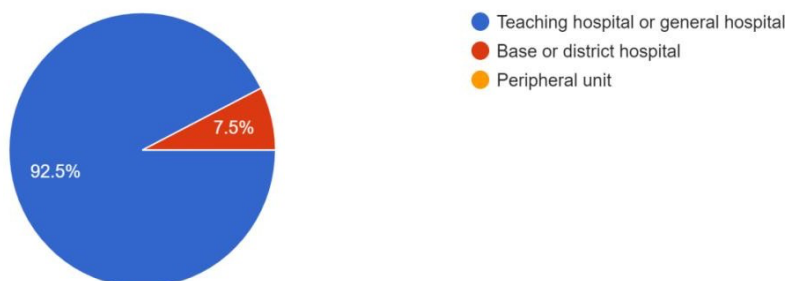
## 5. Results- TNA of Nursing Officers

### A. Basic demographic data

#### Type of Hospital

What type of a hospital you are working currently?

67 responses

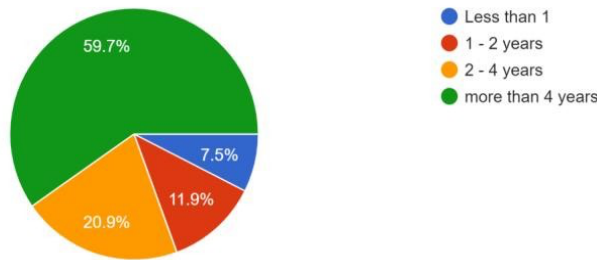


7.5% of the nurses who participated in the survey were from base or district general hospitals, while the majority (92.5%) was from teaching hospitals or general hospitals in Sri Lanka. They

were none of them from Peripheral units. These nurses are better suited because they work during emergencies and are associated with emergency care facilities under the supervision of a specialist.

Years of experience in emergency service

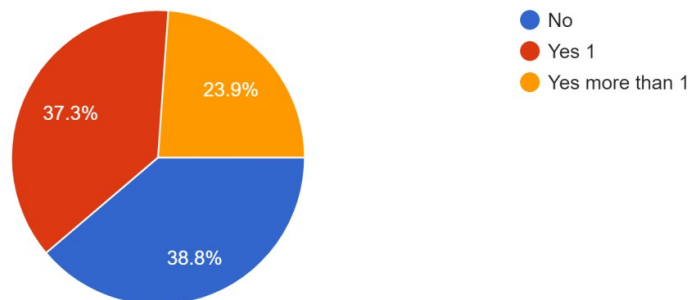
Years of experience  
67 responses



Nearly 59.7% of the nurses indicated that they had more than 4 years of experience providing emergency treatment. Twenty.9% of respondents reported having 2-4 years of experience, while 11.9% said they had only 1-2 years. Only 7.5% of those who responded to the study claimed to have less than a year's experience in emergency treatment, the same percentage as physicians.

Previous training on emergency care

Have you attended any training in primary or emergency care before  
67 responses



38.8% of nurses working in this profession have not previously received any emergency care training. 37.3% have already received emergency care training, and 23.9% have received more than one.

B. Questionnaire responses.

**Table- 3 Ranking of Topics based on average competency scores**

	Topic	Average Competency	Rank
12	Emergency childbirth	2.0	1
11	Blood gas interpretation	2.58	2
4	Snake Bite	2.59	3
9	Non-invasive ventilation	2.65	4
5	Patient with Arrhythmia	2.66	5
10	Basic invasive ventilation	2.72	6
13	Poisoning or overdosed	2.79	7
6	Patient with chest pain	2.94	8
1	Advance life support	2.94	8
8	Patient with reduced consciousness	3.02	10
2	Advance Paediatric Life Support	3.10	11
7	Patient with SOB	3.10	11
3	Basic Trauma Care	3.13	13

The TNA of Nursing Officers' results showed that "Emergency childbirth" is the training topic with the highest importance, while "Basic Trauma Care" had the lowest priority. The priority level assigned to "Advance Paediatric Life Support" and "Patient with SOB" was equal (11).

## 6. Conclusions & Recommendations.

Fifty-three (53) doctors and 67 nurses working in emergency care settings at various hospitals in Sri Lanka participated in a training need analysis. Some broad conclusions have been reached despite the small number of respondents, in addition to recommendations for training needs and training methodology based on the findings.

Although only 53 doctors and nurses participated in the survey, the bulk came from Sri Lankan teaching hospitals and had more than 4 years of experience.

There was a total of 13 training modules (topics) identified, 11 of which were comparable, but only two of them the emergency delivery and patient with arrhythmia modules were prioritized differently by doctors and nurses. This can be explained by focusing on two key elements of the Sri Lankan healthcare system. First, the discrepancy may be caused by the tasks and responsibilities that these two categories have been given in

regard to the emergency care services that are offered. Even within the same category, roles may fluctuate due to the number of staff members employed and the amenities offered in various hospital emergency care settings. Therefore, in addition to offering staff training, other factors such as human resource & facilities also need to be considered in order to increase oxygen management and emergency care services in Sri Lanka.

Based on the TNA results, it is recommended that different training manuals be created for each group of employees, together with instructor manuals, to conduct two ToT workshops one for doctors and one for nurses and collect feedback from the trainers to further improve the training manuals. The College of Emergency Care Physicians may also consider common cascade training for both physicians and nurses on the Modules (Topics) with the same priority, using appropriate training approaches.

Additionally, it's advised to routinely check on the trainees' knowledge and abilities

using a standardized technique (such as the Kirkpatrick model of training evaluation).

## Reference

- 1) Markaki, A., Malhotra, S., Billings, R. and Theus, L. (2021). Training needs assessment: tool utilization and global impact. *BMC Medical Education*, 21(1). doi:10.1186/s12909-021-02748-y.
- 2) Arora, V. (n.d.). HENNESSY-HICKS TRAINING NEEDS ANALYSIS QUESTIONNAIRE AND MANUAL For use at a local level to identify training and development needs. *www.academia.edu*. [online] Available at: [https://www.academia.edu/7588447/HENNESSY\\_HICKS\\_TRAINING\\_NEEDS\\_ANALYSIS\\_QUESTIONNAIRE\\_AND\\_MANUAL\\_For\\_use\\_at\\_a\\_local\\_level\\_to\\_identify\\_training\\_and\\_development\\_needs](https://www.academia.edu/7588447/HENNESSY_HICKS_TRAINING_NEEDS_ANALYSIS_QUESTIONNAIRE_AND_MANUAL_For_use_at_a_local_level_to_identify_training_and_development_needs).

# Distribution and Performance Evaluation of Radiology and Imaging Services in Line Ministry Hospitals in Sri Lanka

*Rathnakeerthi A, Dolamulla S, Panapitiya L*

**Abstract:** Radiology and imaging services play a pivotal role in modern day healthcare services as the use of radiology and imaging equipment is essential to diagnose and treat most health conditions. Nonetheless, a substantial portion of the government's healthcare budget is allocated each year towards the acquisition, upkeep, servicing, and logistical support required to deliver these services.

**Objective:** To assess the distribution and conduct a performance evaluation of radiology and imaging services in line ministry hospitals in Sri Lanka

**Methodology:** A cross sectional descriptive study was conducted in all the line ministry hospitals of Sri Lanka. A retrospective study was conducted using standard pro-forma for data collection from Bio-Medical Engineering Department.

**Results:** Only a few hospitals had MRI machines functioning for more than 350 days a year. Further, daily performance ranged from 78 to 5 scans per day. DGH Polonnaruwa has the highest per day performance for CT scans which is 146, whereas DGHH Hambantota shows less than

1 scan per day. There were Teaching Hospitals that performed mammography scans on 345 days of the year, whereas a few Teaching Hospitals performed mammography scans only on 41 days of the year. When there were two mammography machines in one institution, it was seen that the 1<sup>st</sup> machine had functioned for only 250 days within the year and the second machine being even more underutilized and

has functioned less than 100 days in the year 2021. Mammography machines also show a similar daily performance variation in National level hospitals which is approximately 18 scans per day whereas most hospitals have performed less than 10 scans per day.

**Conclusion:** There is a marked difference in the performance of MRI machines within the line ministry hospitals. Some hospitals have shown high number of scans performed per day as well as they have functioned daily throughout the year. CT and mammography also show a similar trend.

**Recommendation:** To improve performance in imaging services it is noteworthy to study resource availability, distribution, and utilization of medical technologies within Sri Lanka.

## 1.1 Introduction

Radiology and imaging services play a pivotal role in modern day healthcare services as the use of radiology and imaging equipment is essential to diagnose and treat most health conditions. As a result of the rapid changing technologies in modern medical science, the clinical imaging services have been constantly and dramatically sophisticating for the last two decades. This has increased not only the accuracy of testing but also the cost, demand, and the utilization of these imaging modalities. Nonetheless, a substantial portion of the government's healthcare budget is allocated each year



towards the acquisition, upkeep, servicing, and logistical support required to deliver these services. The productivity and efficiency of services depend on utilization of the equipment, and underutilization indicates higher cost of healthcare which is a global issue but most of the poorly utilizing countries are also situated in SouthAsia and Africa.

The Ministry of Health is the responsible healthcare organisation and the principal health service provider for the citizens of the country. Though Sri Lanka has been providing free healthcare at the point of delivery, the out-of-pocket expenditure is as high as 52 percent. Sri Lanka also spends a significantly low, less than 3 per cent of the gross domestic product (GDP) for health. Nearly forty percent of government health budget is spent on the pharmaceuticals and medical devices.<sup>1</sup>

The government hospitals mainly provide curative health care facilities in the allopathic system through a tiered system with defined levels of care. These levels of care range from tertiary care hospitals (National Hospitals, Teaching hospitals, and specialized hospitals) to secondary care hospitals (District General Hospitals and

Base Hospitals), and primary care through divisional hospitals with non-specialist care and primary medical care units. According to the Service Availability and Readiness Assessment (SARA) survey conducted in 2017, 628 hospitals provide in-patient care facilities and have a combined total bed strength of 83,275 with an average of 3.9 beds per 1000 population. Imaging services such as computed tomography (CT), Magnetic Resonance Imaging (MRI), angiography and Positron Emission Tomography scans (PET), and mammography are mainly available at tertiary care facilities and several specialized hospitals and selected DGH's.<sup>2</sup> To understand the strength of the imaging services, it is important to compare the availability of radiology and imaging equipment compared among Asian countries (Table 1).

It had been reported that in 2013, per 1 million persons, there were 1.7 CT scanners, 0.4 MRI machines, 0.6 radiation therapy units, and 2.8 mammography machines per 1 million females 50–69 years.<sup>3</sup>(OECD/WHO, 2016).

The availability of data comparison is as mentioned below.

**Table – 1 Availability of imaging equipment per million population in selected countries in Asia compared to the average of OECD countries in 2014.**

Country	CT	MRI	Mammography*
Sri Lanka**	1.7	0.4	2.8
Thailand	6.0	-	27.9
Myanmar	0.1	0.1	0.7
Malaysia	6.4	2.9	86.7
Singapore	8.9	7.8	127.7
Philippines	1.1	0.3	13.1
OECD	25.0	14.8	176.7

\*Per million females between 50–69 years\*\* 2013 data Source: OECD/WHO, 2016

## 1.2 Literature Review

Accurate and timely radiological imaging results are essential for most health disciplines yet continue to be neglected in most parts of the world. It is clear as the 3<sup>rd</sup> Sustainable Development Goal (SGD) which is to reduce disease burden has 13 targets and 26 performance indicators, yet not one which mentions imaging services.<sup>4,5,6</sup> It has been stated that investing in imaging services produce economic benefits as it outweighs the initial cost when compared to reduction of future expected expenses with an estimated net survival benefit.<sup>7</sup>

A study done in the central province of Sri Lanka using a self-administered questionnaire for radiographers in the units has shown that all basic radiological imaging services are available in a balanced manner throughout the province while Mammography and MRI facilities were confined only to Kandy district.<sup>8</sup> In a study done in a radiology department of a tertiary care hospital in India stated that they have selected only 4 types of imaging services and reviewed retrospective data on two consecutive years to compare the performance<sup>9</sup>. There has been an increase in the utilization of CT scans (12.55%) and MRI scans (18.77%) during the two years.

### **1.3 Justification**

Considering the ongoing economic crisis Sri Lanka is facing, rational use of technology is of utmost importance. Health Technology Assessment (HTA) analyses and interprets evidence from the research findings and determines how these results could be applied to the local health context and therefore is useful in informed decision-making.

The financing for the healthcare system in Sri Lanka consists mainly of general

taxation and out of pocket payments from households. With rapidly changing epidemiological and demographic patterns and the challenges of facing emerging and reemerging diseases, it is timely to consider the current financing mechanisms and decisions for allocations of health resources at both national and provincial levels. Failing to address this would lead to inefficient service deliveries and increase out of pocket expenditure.

However, in the current context, HTA is not used in the decision-making process in Sri Lanka and HTA is not performed formally during the procurement process or during the technical evaluation process. Health systems everywhere in the world are under huge pressure due to unlimited user expectations and goals to achieve in the context of finite budgets and limited resources. Hence, the burden of healthcare systems to change has also been mounting. As such, the Ministry of Health has to explore ways to transform our healthcare systems to ensure sustainability in the coming years. Establishment of Health Technology Unit will be the way forward to meet the future challenges. There are many international literatures available in this area, however many studies in the local context is scarce.

### **2.1 Objective**

To assess the distribution and conduct a performance evaluation of radiology and imaging services in line ministry hospitals in Sri Lanka

### **2.2 Specific Objectives**

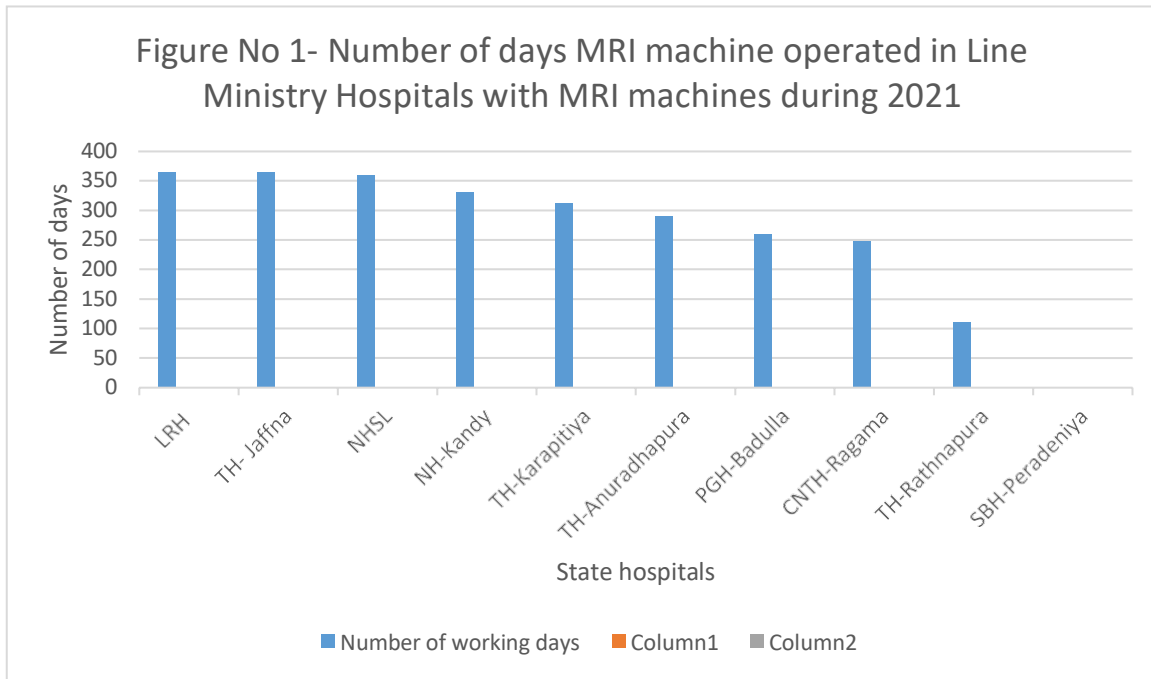
- To study the availability and distribution of CT, MRI, and Mammography services in line ministry hospitals.

- To study the present utilization pattern of CT, MRI, and Mammography services in line ministry hospitals.

### 3. Methodology

A cross sectional retrospective study was done using a desk review including secondary data review. All line ministry institutions including National Hospitals, Teaching Hospitals, Provincial General Hospitals and District General Hospitals and Specialized hospitals were taken into the study sample. Key informant interviews were held to assess factors affecting performance indicators. Statistical data of Line ministry hospitals were collected from 1st January 2021 to 31<sup>st</sup> December 2022

#### MRI performance



**Figure No 1: Number of days MRI machine operated in Line Ministry Hospitals with MRI machines during 2021**

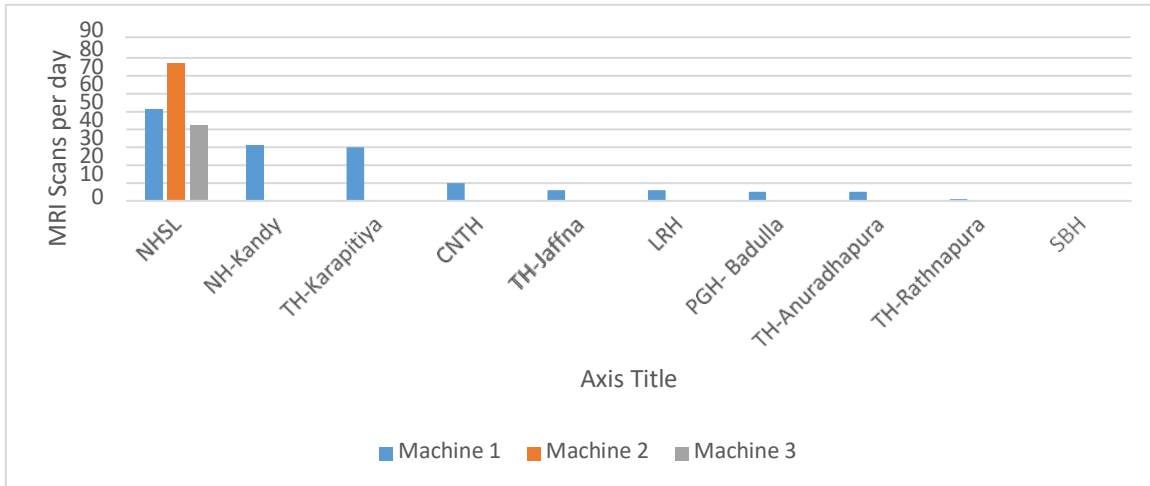
According to figure No 1, TH Jaffna and LRH have the highest number of working days for 2021 as both have performed on 360 days. National Hospital Kandy has been

from Biomedical Engineering Department. Data relevant to MRI, CT and mammography were obtained for the purpose of this study. A well-structured data collection form was used to collect data and it was analysed using spread sheets and expressed using descriptive statistics. An interview guide was used to perform the key informant interviews.

### 4. Results and Findings

For this study following high-end Medical Technologies were considered. They are namely MRI, CT, and Mammography.

working for 330 days. The MRI machine at SBH Peradeniya has been out of order since 12<sup>th</sup> March 2018.

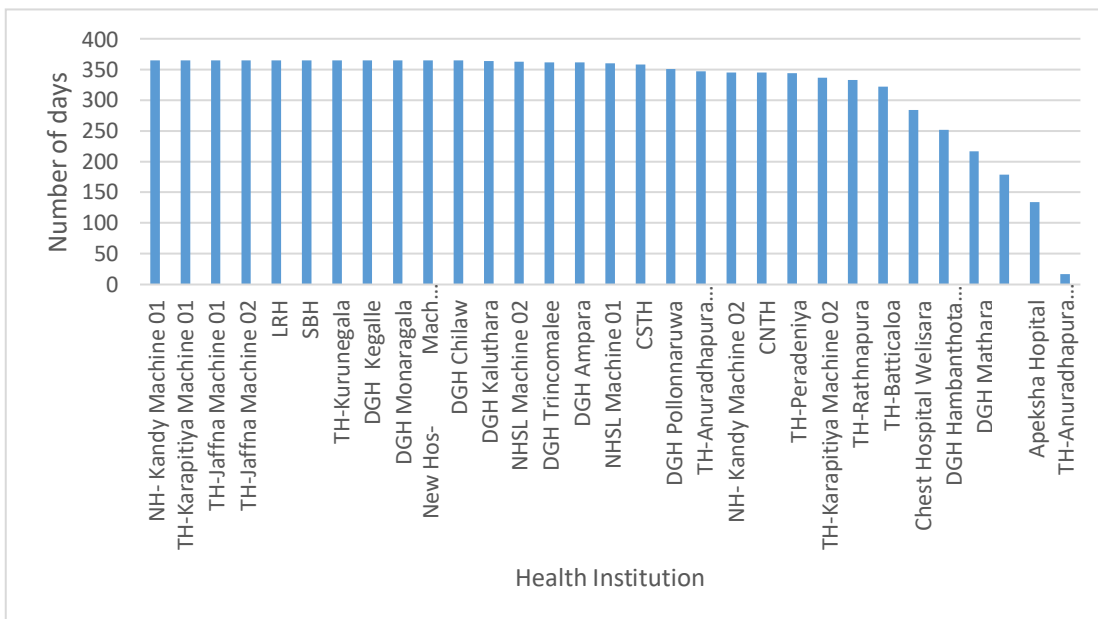


**Figure 2: Number of MRI Scans performed per year in Line Ministry Hospitals in 2021**

According to Figure 2, all MRI machines in NHSL performs more than 50 MRI scans per day, followed by National Hospital Kandy which is 33 MRI scans per day and

TH Karapitiya with 30 MRI scans per day. Most of the other hospitals perform less than 10 MRI scans per day when considered annually.

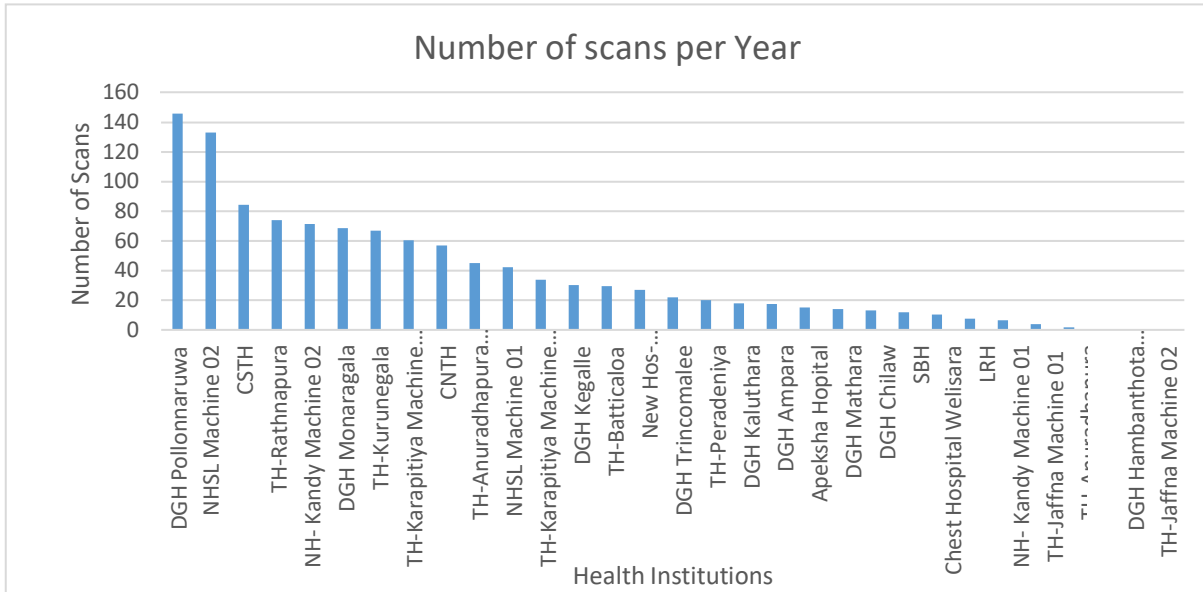
### CT Machine performance



**Figure 3. Number of days CT machines functioned in Line Ministry Hospitals in 2021**

According to Figure 3, most hospitals performed CT scans more than 300 days per

year. TH Anuradhapura only performed for 17 days due to software error in machine.

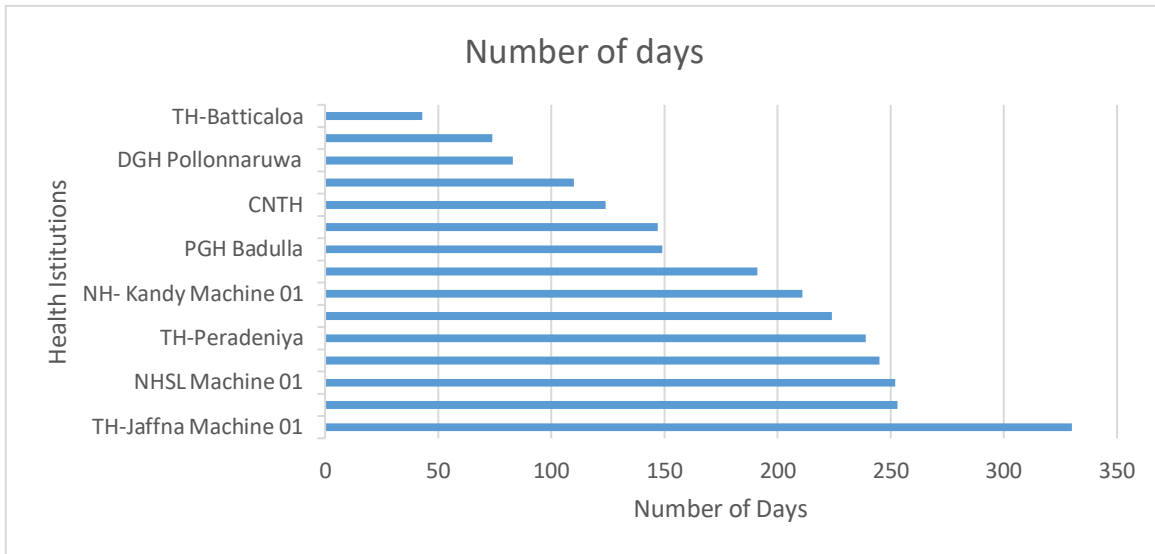


**Figure 4: Annual performance of CT machines in Line Ministry Hospitals in 2021**

According to Figure 4, DGH Polonnaruwa has the highest per day performance for CT

scans which are 146 whereas DGH Hambantota shows less than 1 scan per day.

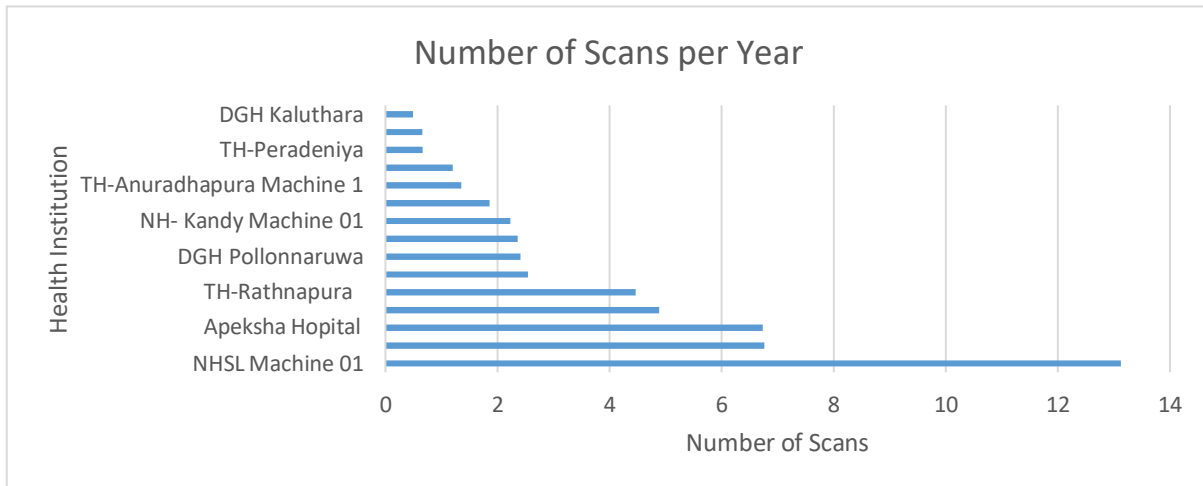
**Mammography Machine performance in line ministry hospitals**



**Figure 5: Number of days Mammography performed in Line Ministry Hospitals in 2021**

According to Figure 5, Jaffna Teaching Hospital performed mammography scans on 345 days whereas Teaching Hospital

Batticaloa performed mammography scans on 41 days.



**Figure 6: Number of mammography scans performed in Line Ministry Hospitals in 2021**

According to Figure 6, NHSL has shown an annual performance of 13 scans per day, while DGH Kaluthara showed an annual performance of 0.5 scans per day. Qualitative results analysis showed that there are few factors identified to show such disparity in performance. Waiting lists and demand, breakdown of equipment, down time of equipment, availability of Radiographers, Medical Consultants and reagents were identified as some factors contributing to this disparity.

#### 4. Discussion

MRI machines are designed to deliver 24/7 service with a considerably short life span of 5-7 years, however when looking at the results it is evident that only a few hospitals had MRI machines functioning for more than 350 days. Further daily performance ranges from 78 scans per day to 5 scans per day. This could be due to demand as well as availability of human and physical resources.

CT machines show an unequal distribution of machines as DGH Polonnaruwa has only one CT machine and has performed 58,000 CT scans in the year 2021 whereas DGH Hambantota has 3 CT machines which altogether has only performed less than 10,000 scans.

Mammography machines have also shown that when there are two machines in one institute like in NHSL, the 1<sup>st</sup> machine has functioned only 250 days within the year and the second machine being even more underutilized and has functioned less than 100 days in 2021. Mammography machines also show a similar daily performance variation in National level hospitals which is approximately 18 scans per day whereas most hospitals have performed less than 10 scans per day. This disparity in distribution could be due to political pressures and power of demand. Disparity in annual performance could be attributed to the factors identified during the qualitative findings. However, the limiting factor for this study was not being able to capture individual hospital situation hence exact reasons cannot be pinpointed but rather has identified a plethora of factors in general.

#### 6. Conclusion

There is a marked difference in the performance of MRI machines within the line ministry hospitals. Some hospitals have shown high number of scans performed per day as well as they have functioned daily throughout the year. CT and Mammography also show a similar trend.

There could be many factors affecting such variance. Human Resources, Machine Errors, unavailability of reagents and pandemic situation could be few reasons. An in-depth study should be done to identify the gaps and interventions have to be introduced to overcome the challenges thereby ensuring optimal utilization of high end medical equipment. To improve performance in imaging services it is noteworthy to study resource availability, distribution, and utilization. Further it is important to identify equipment norms for levels of care.

## 7. Recommendation

- To establish a Health Technology Assessment Unit and through the new unit to do following interventions.
- Resource mapping to identify imaging service availability.
- Develop a data base for medical equipment and technologies.
- Develop equipment norms for different levels of care.

## References,

1. [Http://www.health.gov.lk/moh\\_final/english/public/elfinder/files/publications/2019/SARASriLanka2017REPORT.pdf](http://www.health.gov.lk/moh_final/english/public/elfinder/files/publications/2019/SARASriLanka2017REPORT.pdf)
2. Rajapaksa L, De Silva P, Abeykoon A, Somatunga L, Sathasivam S, Perera S et al. Sri Lanka health system review. New Delhi: World Health Organization Regional Office for South-East Asia; 2021.
3. Health statistics OECD,2016
4. Take action for the sustainable development goals. Retrieved from <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>
5. Universal Health Coverage Report. Retrieved from [https://www.who.int/healthinfo/universal\\_health\\_coverage/report/uhc\\_report\\_2019.pdf](https://www.who.int/healthinfo/universal_health_coverage/report/uhc_report_2019.pdf)
6. Wilson ML, Atun R, DeStigter K et al (2019) The lancet commission on diagnostics transforming access to diagnostics. Lancet. [https://doi.org/10.1016/S0140-6736\(19\)31052-9](https://doi.org/10.1016/S0140-6736(19)31052-9)
7. Hricak MM, Abdel-Wahab M, Atun R et al (2021) Medical imaging and nuclear medicine: a lancet oncology commission. LancetOncol. [https://doi.org/10.1016/S1470-2045\(20\)30751-8](https://doi.org/10.1016/S1470-2045(20)30751-8)
8. Udayangani D, Jayasekara UM, WeerakoonBS. Distribution of Diagnostic Radiological Imaging Facilities in Public Hospitals in the Central Province of Sri Lanka. Sri Lankan J. Health. Sci. 2022, 1(2): 70-72. <https://doi.org/10.4038/sljhs.v1i2.34>
9. PadminiKumari B, G Vijay Kumar, K. Ravi Babu (2021) Utilisation of the Equipment's in the Department of Radiology and Imaging Services in a Tertiary Care Centre –A Retrospective Study. J Hosp Med Manage Vol.7 No.4:270.

# Maximum utilization of work capacity subject clerks through workload assessment and employee performance evaluation -A case study from Family Health Bureau

*Rajapaksha D M P*

## **Abstract**

**Introduction:** The current trend of migration along with the reduction of the retirement age and the government decision to temporarily halt the new appointments has shown that human resource management in government institutions is increasingly challenging. Therefore, it has become important to enhance the work efficiency in public sector by achieving the same level of output with a remaining or even with reducing workforce.

**Objective:** This study aimed to identify the performance gaps in subject clerks through a workload assessment in the office of Family Health Bureau and to make recommendations to improve their performance.

**Method:** A workload assessment was conducted for the subject clerks in the office of Family Health Bureau involving quantitative and qualitative data collection through an interviewer administered questionnaire with subject clerks. Additionally, key informant interviews with relevant authorities such as the Director Family Health Bureau, Administrative Officer and the accountant of Family Health Bureau was carried out. Additionally, desk review of previous day's work by each subject clerk was undertaken.

**Results:** In the workload assessment for subject clerks, it was found that all 12 clerks considered their tasks compatible with job

descriptions. While 11 clerks reported manageable time requirements and acceptable task distribution, six had difficulty in prioritizing deadlines. Moreover, 9 clerks had non-task time, and feedback indicated overall satisfaction with workload, although 9 clerks desired additional IT training, while all 10 sought training in 5S, quality, and productivity improvement.

**Discussion:** To address these issues, this study proposes several strategies for enhancing the performance of subject clerks in the Family Health Bureau. These strategies encompass conducting regular employee performance evaluations, analysing training needs, implementing quality and productivity improvement initiatives, streamlining processes through process mapping and developments, and maximizing the effective use of information technology.

**Conclusion and recommendation:** By implementing the recommended strategies, the current workload at the Family Health Bureau can be effectively managed without the necessity of appointing additional staff. This study emphasizes the potential for optimizing work efficiency in government institutions by bridging performance gaps and maximizing the capabilities of existing personnel.

**Keywords:** Human Resource management, Performance evaluation, Workload assessment, Subject clerks.



## 1. Introduction

Due to the prevailing financial crisis in the country, there is a noticeable surge in government employees resigning from their positions and trying to migrate. Furthermore, the government has recently lowered the retirement age and temporarily halted new appointments in the public sector. Therefore, it becomes crucial to enhance the work efficiency within the public sector by achieving the same level of output with a remaining or even with a reduced workforce.

Subject clerks in any office in the government sector play a crucial role in the smooth functioning of an office, as they are responsible for managing and organizing specific areas within the office operations. It is imperative for these individuals to possess adequate specialization and knowledge in their respective areas to effectively carry out their tasks and responsibilities. Subject clerks often act as the primary point of contact for clients, vendors, and other stakeholders, making

good communication skills and professionalism essential qualities for them.

As the Family Health Bureau (FHB) is the national focal point for Maternal and Child Health, subject clerks in FHB, hold a significant position in ensuring the standards and efficiency of the processes in FHB. Their ability to work efficiently and effectively, directly impacts the success of the entire organisation. By providing subject clerks with appropriate training and necessary resources, the organisation can enhance their productivity and overall performance. This improvement in efficiency can also lead to increased customer satisfaction.

However, employee performance is not solely dependent on individual factors. It is also influenced by motivation and the working environment. Therefore, interventions aimed at improving employee performance should focus on developing the three factors namely, ability, motivation, and working environment. (Minnesota,2022) (Figure 1)



Figure 1: Employee Performance = Ability × Motivation × Environment (Mitchell, 2017)

Considering the impact of these factors, it is important to address any issues such as the lack of adequate materials, equipment, and other related facilities. On the other hand, demotivated subject clerks themselves may contribute to the underperformance. Enhancing the performance of subject clerks requires a comprehensive approach after a workload assessment.

A workload assessment is a process of evaluating and analysing the tasks, responsibilities, and demands placed on employees or a team within an organization. The goal of a workload assessment is to determine whether the workload is reasonable, manageable, and aligned with the available resources, including time and personnel. It helps identify potential areas of concern such as excessive workloads, bottlenecks, or areas where additional support or resources may be needed.

## **2. Objectives**

The objectives of this study are as follows:

1. To conduct a workload assessment for the subject clerks working in the office of the Family Health Bureau.
2. To identify performance gaps among the subject clerks.
3. To identify the root causes for performance gaps.

## **3. Methods**

Demographic data was collected using a google form shared among all subject clerks working in the office of Family

Health Bureau. In addition to achieve the above-mentioned objectives, the following methods were used.

- Key informant interviews (KII) with director, the Administrative Officer (AO), accountant in FHB.
- Qualitative and quantitative data was collected from all subject clerks by an interviewer administered questionnaire designed to assess the workload of subject clerks.
- Direct observations were done by the principal investigator in establishment and account sections of the office of FHB.
- Desk review was done at FHB, including a thorough examination of documents such as duty lists of subject clerks, records of their previous day's work, their work planning and organisation at the workstation, institutional-level interventions implemented to improve their performance, and randomly selected documents like personal files.

### **3.1 Data Triangulation**

Data collected through KIIs, desk review, direct observation, and FGD were triangulated with the data collected by interviewer administered questionnaire to ensure the validity and reliability of findings.

The data collected through the above methods were used to perform a workload assessment through following steps outlined in figure 2.

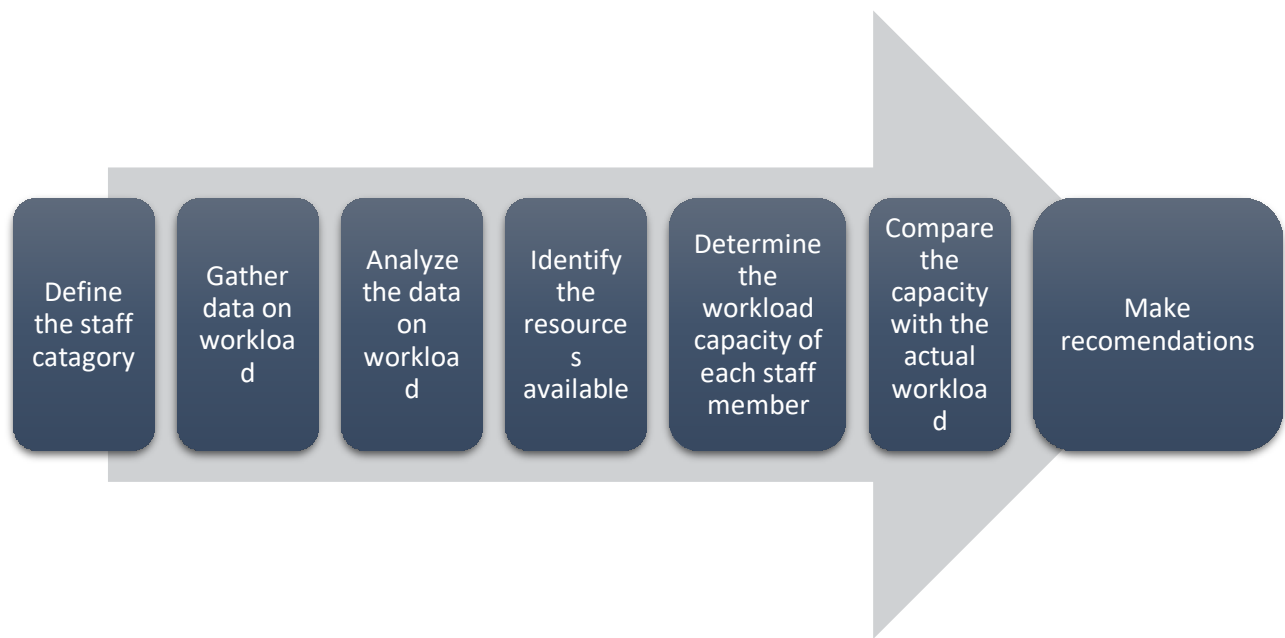


Figure 2: Steps in the workload assessment

A focus group discussion was conducted with the Director FHB, the accountant, and the AO of the FHB, one senior registrar in community medicine, and one registrar in Medical Administration to develop strategies for the identified gaps in workload assessment.

## 4. Results

### 4.1 Demographic data

According to the data collected through the google form the majority of the subject clerks in FHB are below the age of 40 years (75%). (Table 1) and females (87.5 %)

Table 1: Age distribution of the subject clerks

	Age category	Percentage
1	21-30 y	37.5
2	31-40 y	37.5
3	41-50y	12.5
4	51-60y	12.5
	Total	100

Majority of them are married (62.5%) and 50% of them are having at least one child. Based on the data gathered through the google form 62.5% of the subject clerks are having bachelor's degrees. (Table 2)

Table 2: Educational levels of the subject clerks

	Education level	Percentage
1	Ordinary level	12.5%
2	Advanced level	25%
3	Bachelor's degree	62.5%
	Total	100

#### 4.2 Workload assessment through interviewer administered questionnaire (IAQ) with subject clerks.

IAQ has 7 areas to assess the workload. Table 3 shows the results of the workload assessment.

Table 3: Results of workload assessment

	Area in IAQ	Results
1	<b>Compatibility with Job Descriptions</b>	All 12 subject clerks reported that their key tasks and responsibilities were compatible with their job descriptions, indicating a high level of alignment between assigned duties and job expectations.
2	<b>Task Distribution</b>	11 subject clerks reported that the distribution of tasks was acceptable, indicating a generally balanced workload, while one subject clerk expressed concerns about task distribution.
3	<b>Manageability of Time Requirements</b>	11 subject clerks affirmed that the time required for each task was manageable, suggesting that they could complete their duties within reasonable timeframes. One subject clerk found task time requirements challenging.
4	<b>Consideration of Deadlines and Priorities</b>	3 subject clerks indicated that they consistently considered deadlines and priorities when managing their tasks. In contrast, 9 subject clerks reported challenges in this regard.
5	<b>Non-Task Time Allocation</b>	9 subject clerks reported having non-task time on both the current day and the previous day, while 3 indicated that their schedules did not allow for such time.
6	<b>Feedback on Workload Manageability</b>	11 subject clerks expressed satisfaction with their workload, suggesting that it was manageable. Only one clerk provided feedback indicating concerns about their workload.
7	<b>Training Needs</b>	9 subject clerks identified a need for further training in IT, while 10 clerks expressed a need for training in 5S, quality, and productivity improvement.
8	<b>Bottlenecks</b>	All subject clerks accepted that the absence of well-defined and developed work processes is a bottleneck in improving their performances.

##### 4.2.1 Performance gaps identified through IAQ.

Based on the workload assessment following problems were identified through the interviewer administered questionnaire and direct observation.

1. Lack of work experience among most of the clerks.
2. Poor attitudes displayed by them.
3. Inadequate training needs assessments and training opportunities.
4. Inadequate IT knowledge.
5. Unnecessary movements in processes.
6. Lack of motivation.
7. Time wasted due to dependency on support staff for simple tasks, like photocopying.

8. Minimal utilization of IT by subject clerks.
9. Shortage of box files with certain subject areas.
10. Transportation issues.
11. Financial issues of the subject clerks.
12. Lack of an appraisal system.
13. Inadequate supervision by the section heads.

However, the workload assessment revealed that the existing workload is not exceeding their capacity if they are provided the adequate training and facilities.

#### ***4.3 Results of the data collected through key informant interviews***

By the key informant interviews conducted with the Director FHB, the administrative officer and the accountant, the following recommendations were proposed to improve the performance of subject clerks in the Family Health Bureau (FHB):

##### **I. Conducting regular Employee Performance Evaluations (EPE)**

EPE is recommended for their performance improvement. EPE is a process with a series of defined and interrelated activities in 10 steps. (Opatha, 2016) (Figure 3), and Table 4 shows the recommended activity for each step of the process.

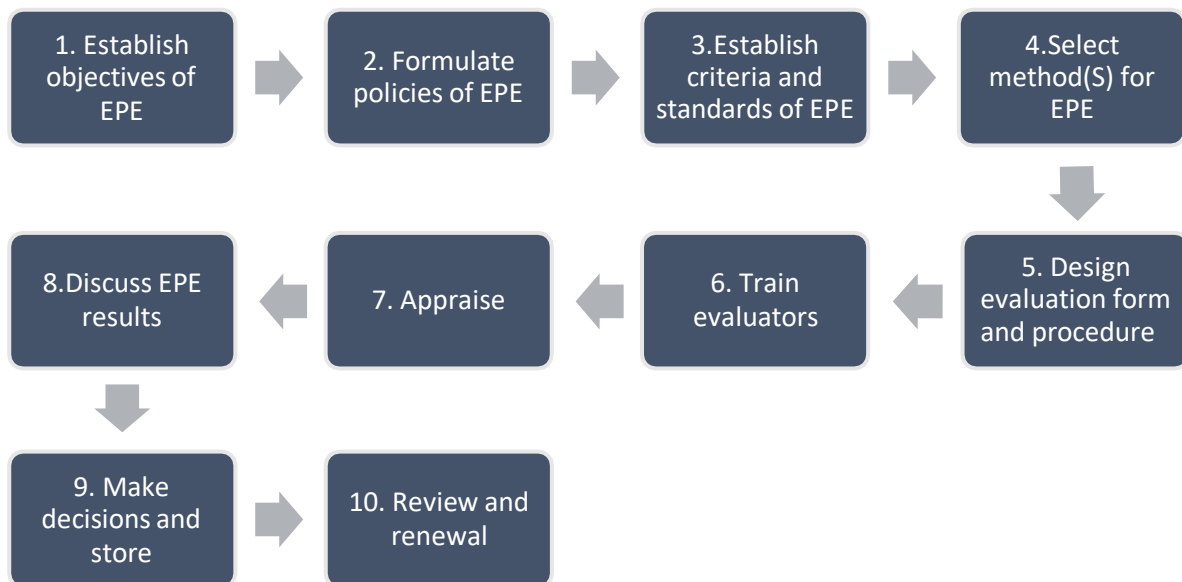


Figure 3: Recommended EPE process

Table 4: Relevant activities for performance evaluation of subject clerks

No.	Step	Recommendations
-----	------	-----------------

1	Establish objectives of EPE	The objectives should be to ascertain the current level of job performance of the subject clerks and to identify the development needs of their job performance.
2	Formulate policies of EPE	Conducting EPE for subject clerks annually. Eg: in month of December
3	Establish criteria and standards of EPE	<ul style="list-style-type: none"> <li>• Number of personal files (PF) one clerk supposed to maintain.</li> <li>• Percentage of PF updated at the time of evaluation.</li> <li>• Time taken to update the PF from the increment date.</li> </ul>
4	Select method(S) for EPE	EPE methods such as “Management by objectives” (MBO), “Behaviorally Anchored Rating Scale” (BARS) or “Behavioral Observation Scale” (BOS), 360° method can be used.
5	Design evaluation form and procedure	Designing the evaluation forms for the subject clerks depending on the EPE method selected to be used.
6	Train evaluators	Un biased evaluators should be selected and trained.
7	Appraise	Evaluation of the job performance using above selected method should be done in this step. Evaluation forms designed at step 5 is used for the evaluation.
8	Discuss EPE results	After completing the evaluation, the evaluator should give the feedback to the relevant subject clerk in an interview.
9	Make decisions and store	Decisions on following aspects can be taken depending on evaluation results. <ul style="list-style-type: none"> <li>• Training</li> <li>• Manpower planning</li> <li>• Promotions</li> <li>• Rewards</li> </ul> Evaluation forms should be kept in files for several years.
10	Review and renewal	Review and renewal of EPE process may be needed depending on changes in duties and the responsibilities of the job. Eg: Changing from paper-based files to digital files.

## II. Develop an HR Database for FHB:

- Implement a comprehensive HR database to improve the efficiency of personal file management.
- Plan the transition from a paper-based system to an electronic file system (e-file).

### III. Conduct Training Needs Analysis and In-Service Training:

- Perform a training needs analysis for subject clerks and provide relevant training, including IT training, communication skills development, quality concept training, and responsiveness training.

### IV. Practice Quality and Productivity Improvement Activities:

- Conduct quality and productivity improvement activities, including section-level competitions.
- Organize competitions such as "5S" implementation or quality circle competitions between administrative and account sections.
- Aim to participate in national-level competitions, which will motivate staff and promote team building.
- Benchmark best-performing offices to learn from their practices.

### V. Introduce Quality Control Tools:

- Implement quality control tools (QC tools) and techniques to enhance the quality of functions in the administrative and establishment sections of FHB.
- Utilize checklists and other tools for quality control and quality assurance purposes.

### VI. Simplify Processes through Process Mapping and Development:

- Conduct process mapping exercises to identify areas for simplification and improvement.
- Streamline processes to eliminate unnecessary steps and optimize efficiency.

### VII. Provide Additional Facilities:

- Provide safety lockers for maximum document security, particularly for personal files.

## 5. Discussion

Majority of the subject clerks in the office of the FHB were below the age of 40 years and they have significant amount of time left in their service. Thus, it is cost effective to improve their performance through performance appraisals and training after proper training need analysis. Given that most of them are graduates, their education levels should be sufficient to effectively receive the training.

Training need analysis has not been conducted in FHB so far for the subject clerks and they have expressed the need for the training such as IT, Japanese 5S, improvement tools and process developments. In addition, the establishment of a regular performance assessment system was identified as important in KIIs conducted with relevant authorities.

## 6. Conclusion and recommendations

Based on the workload assessment, (figure 2) and the KIIs conducted with relevant authorities it can be concluded that there are 3 identified major gaps.

1. Training need analysis has not been done for them during their service.
2. There is no good performance appraisal system at these sections in FHB.
3. Most of the subject clerks are relatively less experienced and they don't have an adequate knowledge on quality and productivity concepts, process development and information technology.

Thus, following activities are recommended to enhance the performance of the subject clerks.

1. Establishment of a performance appraisal system to subject clerks aligned with the organizational objectives.

2. Conducting proper IT training and introduction of the IT systems to facilitate their work.
3. Mapping each process in the office and identify irrelevant steps and delays. Development of the processes should be done after those irrelevant steps and delays.
4. Establishment of a Quality Management Unit (QMU) in the FHB and appointing two Work Improvement Teams (WIT) to the establishment and account sections for quality and productivity improvement activities.

Hence, it is concluded that their current workload can be effectively managed through the implementation of the recommendations. These proposed improvements can be implemented without the need to appoint additional staff.

## 7. References

### Bibliography

- 1) Minnesota, U. o. (2022). *THEORIES OF MOTIVATION*. Retrieved from open library: <https://ecampusontario.pressbooks.pub/orgbehavior/part/chapter-5-theories-of-motivation/>
- 2) Opatha, H. (2016). *Human resource Management*. University of Sri Jayawardanapura. Mitchell. (2017). *heories of Motivation*. Retrieved from Libraries: <https://open.lib.umn.edu/organizationalbehavior/part/chapter-5-theories-of-motivation/>



# **Experience at Manor Hospital of Walsall Healthcare NHS Trust, United Kingdom on the application of simple tool of National Early Warning Score to reduce the Intensive Care Unit admissions.**

*Pathirage I D*

## **Abstract**

Intensive care units serve critically ill patients who need advanced life support to ensure normal bodily functions that are unable to provide in normal ward set up. Due to need of high-tech equipment and skilled workforce, ICU care is costly with limited availability globally. Sepsis is a leading cause of admissions to these units and National Health Services England has introduced NEWS2 score to facilitate identification and treatment of these patient thus preventing them being deteriorated.

Manor hospital has experienced significant reduction in ICU admissions by scrutinizing their NEWS2 scores and sepsis six pathway, within a short period of time. Considering the limited ICU facilities in Sri Lanka it is worthwhile to pay attention on adoptability of this simple tool with necessary modifications in the country and existing system could be utilise in this regard as current bed head ticket requires most of the parameters used in NEWS2 to be recorded.

## **Introduction**

Intensive care units cater to patients with severe or life-threatening illnesses and injuries, which require constant care, close supervision with advanced support equipment and medication to ensure normal bodily functions that is unable to provide in normal ward set up. Even in developed

countries ICU beds are limited despite the high demand and in 2021 UK had 7.3 critical care beds per 100,000 people, compared to Germany's 33.8 and the USA's 34.3(1) while this was 3.0 in Sri Lanka with a total of 650 ICU/HDU beds (2). Caring in ICU is always costly and according to NHS data, the average cost for an ICU patient was £2548.00.00 in 2021/2022 which has increased by nearly £1000 compared to £1621 in 2020/2021 (3).

Sepsis is a leading cause of admission to an ICU as well as ICU mortality (4), and a common cause of readmissions among survivors (5,6,7). In 2017,48.9million cases and 11 million deaths were reported due to sepsis accounting for 20% of total global deaths (8). Early administration of antibiotics is associated with better survival, thus screening and early detection of sepsis is crucial (9). Numerous scores have been developed both for detection and prognostication of sepsis including Systemic Inflammatory Response Syndrome (SIRS), quick Sequential Organ Failure Assessment (qSOFA) and National Early Warning Score 2 (NEWS2) and NHS England uses NEWS2 which was superior and more user friendly (10,11,12).

## NEWS2

The NEWS was developed in 2012 by the Royal College of Physicians and new oxygen saturation scale (scale 2) for hypercapnic respiratory failure patients was introduced with NEWS2. Scores range from 0 to 20 and it is important to record all parameters for the accurate outcome prediction.

Out of 7 parameters, aggregated value of 5 or single parameter recording of 3 is considered as a sepsis trigger. (Figure 01) Once triggered sepsis check list is opened consisting of 6 predictors to be completed within 1 hour. (Table 02)

Physiological parameter	Score						
	3	2	1	0	1	2	3
Respiration rate (per minute)	≤8		9–11	12–20		21–24	≥25
SpO <sub>2</sub> Scale 1 (%)	≤91	92–93	94–95	≥96			
SpO <sub>2</sub> Scale 2 (%)	≤83	84–85	86–87	88–92 ≥93 on air	93–94 on oxygen	95–96 on oxygen	≥97 on oxygen
Air or oxygen?		Oxygen		Air			
Systolic blood pressure (mmHg)	≤90	91–100	101–110	111–219			≥220
Pulse (per minute)	≤40		41–50	51–90	91–110	111–130	≥131
Consciousness				Alert			CVPU
Temperature (°C)	≤35.0		35.1–36.0	36.1–38.0	38.1–39.0	≥39.1	

Figure 01 – Components of NEWS2

### Manor Hospital

Manor Hospital is an acute care hospital with 546 beds with a maximum 9 patients with level 3 (2 or more organ involvement with or without ventilator support) capacity ICU, consisting of 18 beds.

Care Quality Commission visit of 2020 highlighted the need of scrutinizing early detection of sepsis as only 28% patients had been successfully completed the sepsis six pathways. The sepsis team was established in January 2022 forming SORT (Sepsis and Outreach Response Team) combining with the existing outreach response team with the aim of

- Ensuring that the 90% of patients screened for sepsis receive antibiotics within 60 minutes.
- All patients screened positive for sepsis receive sepsis six with Trust wide action plan.

SORT supported the wards in completing sepsis six pathway, providing teaching to multidisciplinary teams on importance of recognition and treatment of sepsis, supporting with necessary guidelines while carrying out the audits on sepsis compliance. Every morning, night outreach nurse summarises the new sepsis triggered patients to the sepsis team and data is entered to the

digital system according to NEWS2 >7 (high) and 5-6 (medium) values. Compliance on completion of opened sepsis six packs is

checked twice daily through the system and sepsis nurses visit the units to assess the patients especially if scores are escalating.

Table 01 –Sepsis six compliance in 2021 and 2022

Year	Completed Within 1h	Completed after 1h	Total Completed	Not completed	Total Opened	Percentage completed
2021	1451	708	2159	3522	5681	38%
2022	2595	1505	4100	1352	5452	75.2%
Up to 30/4/23	984	617	1601	192	1793	90%

Nearly 90% of check lists are opened at Emergency Department and major cause of non-completion was due to patients being discharged home without being admitted before closing the opened check list. With SORT interventions this number of non-completed check lists had significantly reduced. (Table 01 and 02)

Table - 02 Sepsis six compliance within one hour on total sepsis check lists opened.

Year	Antibiotics started	IV fluid administered	Oxygen given	Blood culture done	Urine output monitoring	Lactate and other blood investigations
2021	2892(50.9%)	2733(48.1%)	3039(53.5%)	2191(38.6%)	2628(46.3%)	3022(53.2%)
2022	3953(72.5%)	3795(69.6%)	4045(74.2%)	3338(61.2%)	3746(68.7%)	4029(73.9%)
Up to 30/4/23	1423(79.3%)	1233(68.7%)	1325(73.9%)	1157(64.5%)	1197(66.7%)	1212(67.6%)

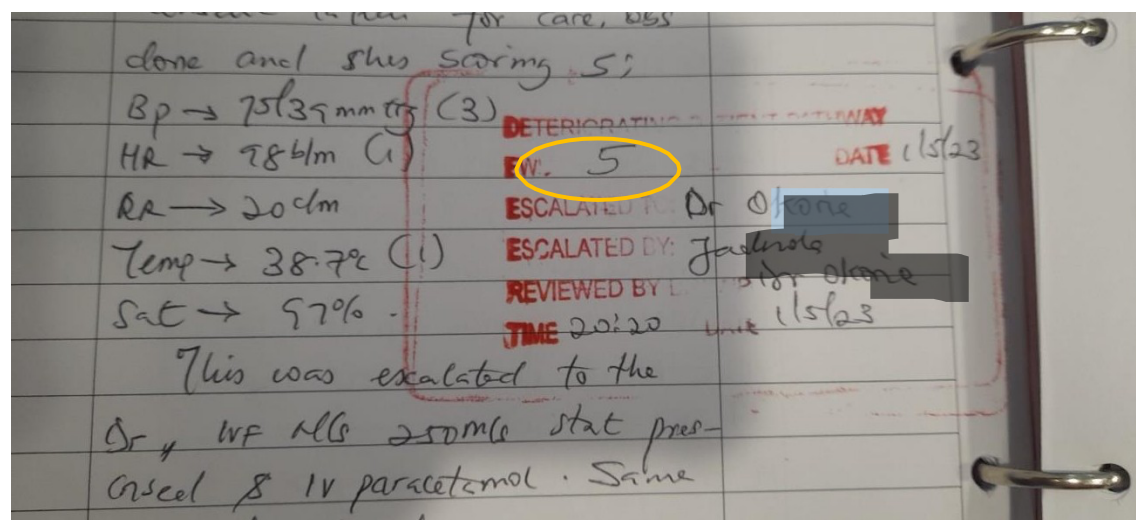


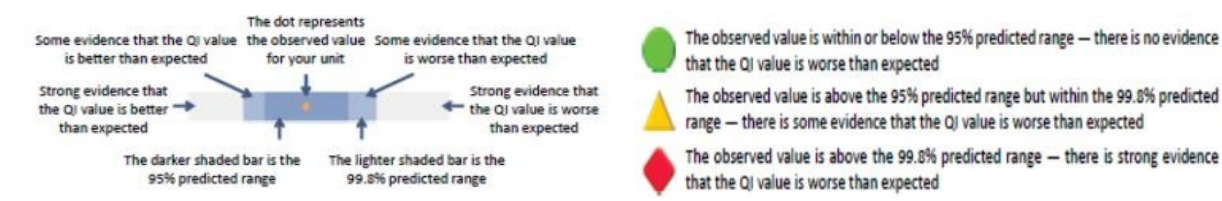
Figure 2 – Rubber stamp showing opening of sepsis six pathways.

With the interventions of SORT, the Manor Hospital was able to improve the management of sepsis patients, reducing occurrence of complications and need of ICU care thereby saving considerable amount of cost.

Compared to the 2021, the percentage of ICU admission with sepsis has dramatically reduced and this was clearly shown in the latest ICNARC (Intensive Care National Audit and Research) report (13). (Table 3, Figure 03 and 04)

Table 03- ICU admission of sepsis patients with implementation of SORT in 2022

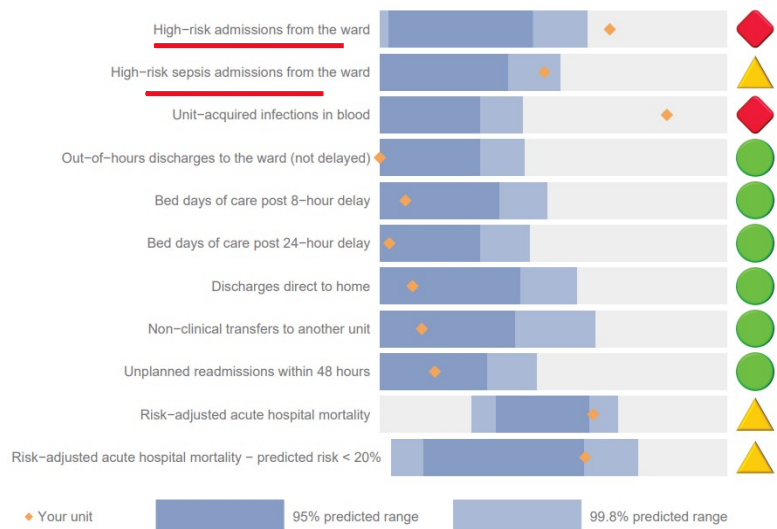
Indicators	2021	2022
completed sepsis check lists	2159	4100
ICU admissions with sepsis	47	34
percentage of ICU admissions among completed sepsis check lists	2.2%	0.8%



Manor Hospital, Critical Care Unit  
Quarterly Quality Report: 1 April 2021 to 30 September 2021



### Quality indicator dashboard



Date of report: 17/11/2021

3

©ICNA

Figure 03 - Critical care data for Q1/Q2 of 2021 financial year, ICANRC report 2022

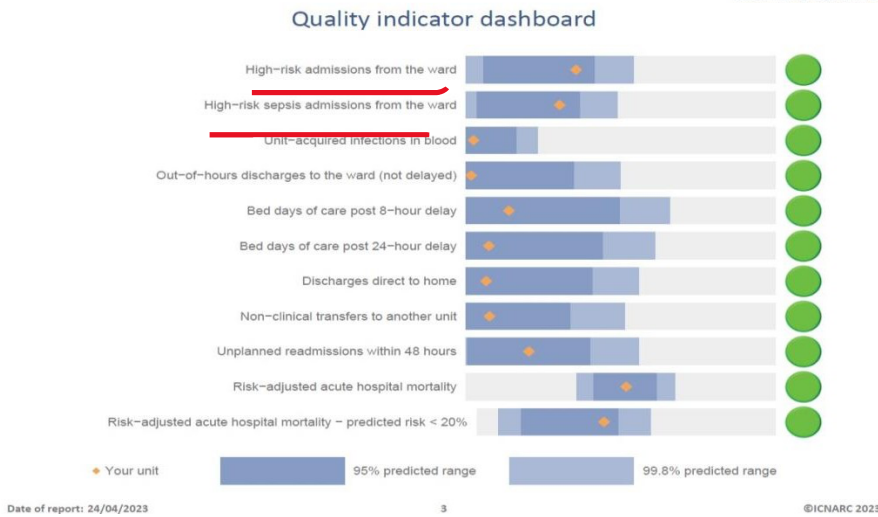


Figure 04- Critical care data for Q1/Q3 2022 financial year, ICNARC report 2023

### Conclusion and recommendations

The SORT interventions on proper documentation of NEWS2 scoring and sepsis six pathway is much promising considering the results achieved within one year of starting team, which comprises only 5 nurses for the whole hospital while service of sepsis team is limited to only day time at present.

In Sri Lanka sepsis is a significant cause of ICU admissions and in 2020 out of 89 maternal deaths 7 were due to sepsis (14). Majority of instances admissions to ICU

occurs at a later stage of disease resulting in higher mortality.

As the NEWS2 is effective in identifying the deteriorating patients early, considering the very limited ICU beds available in the country and the resource scarcity in health sector, it is highly recommended to pay attention on adaptability of NEWS2 in our health care institutions with necessary modifications and input of relevant colleges. Furthermore, existing 2<sup>nd</sup> page of our bed head ticket which requests to record most of the parameters used in NEWS2 could be utilised on this regard.

### Reference

1. Covid-19: Critical care beds shortage prompts calls for review - BBC News. Available at <https://www.bbc.co.uk/news/uk-56234898>, accessed on 28.05.2023.
2. Sri Lanka's covid 19 response: Saving lives today preparing for tomorrow. Available at <https://www.worldbank.org/en/results/2021/08/25/sri-lanka-s-covid-19-response-saving-lives-today-preparing-for-tomorrow>, accessed 28.05.2023.

3. National schedule of NHS costs 2020/2021 and 2021/2022
4. Parner A, Gordon AC, De Backer D, et al: Sepsis: frontiers in diagnosis, resuscitation, and antibiotic therapy. *Intensive Care Med* 2016; 42:1958–1969, available at <https://pubmed.ncbi.nlm.nih.gov/27695884/>
5. Chang DW, Tseng CH, Shapiro MF: Rehospitalizations following sepsis: common and costly. *Crit Care Med* 2015;43: 2085–2093.
6. Goodwin AJ, Ford DW. Readmissions Among Sepsis Survivors: Risk Factors and Prevention. *Clin Pulm Med.* 2018 May;25(3):79-83. doi: 10.1097/CPM.0000000000000254. PMID: 30237689; PMCID: PMC6141202.
7. Franco Palacios C, Solenkova N, Gorostiaga F. Among sepsis survivors, readmissions due to infections occur sooner and are associated with increased mortality. *Anaesthesiol Intensive Ther.* 2020;52(2):105-109. doi: 10.5114/ait.2020.95070. PMID: 32419437; PMCID: PMC10176523.
8. Rudd KE, Johnson SC, Agesa KM, Shackelford KA, Tsoi D, Kievlan DR, et al. Global, regional, and national sepsis incidence and mortality, 1990-2017: analysis for the Global Burden of Disease Study. *Lancet (London, England).* 2020;395(10219):200-11
9. Seymour, C.W.; Kahn, J.M.; Martin-Gill, C.; Callaway, C.W.; Yealy, D.M.; Scales, D.; Angus, D.C. Delays from first medical contact to antibiotic administration for sepsis. *Crit. Care Med.* 2017, 45, 759–765. \
10. Churpek, M.M.; Snyder, A.; Han, X.; Sokol, S.; Pettit, N.; Howell, M.D.; Edelson, D.P. Quick sepsis-related organ Failure assessment, systemic inflammatory response syndrome, and early warning scores for detecting clinical deterioration in infected patients outside the intensive care unit. *Am. J. Respir. Crit. Care Med.* 2017, 195, 906–911.
11. Idrees, M.; Macdonald, S.P.; Kodali, K. Sepsis Early Alert Tool: Early recognition and timely management in the emergency department. *Emerg. Med. Australas.* 2016, 28, 399–403
12. Matt Inada-KimA,. NEWS2 and improving outcomes from sepsis, *Clinical Medicine* 2022 Vol 22, No 6: 514–7 ,doi: 10.7861/clinmed.2022-0450
13. Quarterly quality report. Intensive Care National Audit and Research Centre. 2022 and 2023.
14. Maternal morbidity mortality surveillance unit, Family Health Bureau, Ministry of Sri Lanka.

# Perspectives of Patient Engagement in Base Hospital Mirigama, Sri Lanka

*Malalasekara L I, Wijemanne W M S U, Mallawarachchi S M N*

## Abstract

**Introduction:** World Health Organization (WHO) defines patient engagement as “the process of enabling patients to be active partners in own care and development and delivery of health services, by building effective relationships between patients, professionals, and healthcare organizations”. Healthcare systems are very complex and patient care is provided through a multidisciplinary approach. Studies have shown that involvement of patients for their own care has helped to improve patient satisfaction, better health outcomes, avoiding harm to patients, resulting in cost savings in healthcare [1]. Seven components considered to measure patient engagement levels are communication, education, empowerment, shared decision making, health promotion, patients’ rights, and feedback [2].

**Objective:** To explore the present perspectives of patient engagement in Base Hospital Mirigama.

**Methods:** The study was conducted in the medical wards of the Mirigama Base Hospital. A Self-administered questionnaire was administered to 80 inward patients during the first week of April 2023.

**Results:** There were 73 respondents. None of the seven components measuring patient engagement level showed results of high satisfactory category. However, “component - communication” (listening to patients and discussing their problems by healthcare staff), were comparatively satisfactory

(mean=3.88). Other areas such as explaining patients’ rights by health staff (mean=2.13), encouraging to ask questions (mean=2.71), getting feedback from patients (mean=2.68) and giving information regarding required lifestyle changes to live a healthy life (mean=2.80) were poor and unsatisfactory.

**Conclusion:** The study showed that component of communication is satisfactory (mean=3.8) and the patient rights was the most unsatisfactory component (mean= 2.6). Since none of the components showed highly satisfactory results, it is recommended to strengthen efficient patient engagement in healthcare activities by promoting all seven components of patient engagement.

**Keywords:** Patient-engagement, communication, patient-rights

## Introduction

Healthcare systems are complex in nature and require a multidisciplinary approach for the provision of quality and safe care. Patient engagement is an important factor considered for the satisfactory outcomes in patient care. Currently it has been growing in recognition globally. In patient engagement what is expected is the involvement of patients in their own care which requires developing effective relationships between healthcare providers, organizations, and the patients. Studies done in many countries have shown a number of benefits that include improved

patient satisfaction, better patient outcomes, prevention of risks, harms, misunderstandings, and reduce the cost involved for healthcare [1].

World Health Organization defines patient engagement as "the process of enabling patients to be active partners in own care and development and delivery of health services, by building effective relationships between patients, professionals, and healthcare organizations" [2]. WHO has also identified seven components that should be considered when measuring patient engagement levels. They are communication, education, empowerment, shared decision-making, health promotion, patients' rights, and feedback.

Most healthcare facilities in the developing world have not given adequate recognition for patient engagement activities. However, in order to improve healthcare delivery, it is important to assess the current status of patient engagement in a healthcare facility and identify the areas that require improvements. It is a known fact that the efforts have been taken by the health sector in Sri Lanka to improve patient engagement in its healthcare institutions. National health policy also states that priority should be given to a patient centered health system to ensure patients participation in solving their health issues [3]

### **Objective**

To explore the present perspectives of patient engagement in a government hospital. The Base Hospital Mirigama was selected, as it caters to a diverse patient population from semi urban and rural areas.

## **Methodology**

### **Study Design**

The study was conducted as a descriptive cross-sectional study in the medical wards of Base Hospital Mirigama.

The study population consisted of patients admitted to the medical wards. Study was conducted during the period of 3<sup>rd</sup> of April to 9<sup>th</sup> of April 2023. Convenient sampling technique was used to select participants.

The data collection instrument was a Self-Administered Questionnaire (SAQ), designed based on the seven components of patient engagement. It included a series of multiple-choice questions. The patients were expected to rate their perception and /or experience with a Likert scale which ranged the responses from "Not at all-1" to "Always-5". In this research, 1 indicated high dissatisfaction, and 5 indicated high satisfaction. Clear instructions were given to patients while administering the SAQ. The confidentiality and anonymity of their responses were assured, and informed consent was obtained.

There were 73 respondents out of 80 inward patients.

Descriptive statistical data analysis was done. Accordingly, means frequencies and percentages were calculated for each question. Finally, they were summarized to give overall scores for each component.

### **Results**

Seventy-three inward patients in medical wards responded to the study. 'High



satisfactory results were not shown for any components. However, component-communication (listening to patients and discussing their problem, by healthcare staff), showed comparatively satisfactory results

(Mean=3.88). Most unsatisfactory results were shown in the component, explaining patient rights by health staff (Mean=2.63). (Table 1)

**Table 1: Statistical Analysis of Patient Engagement Components**

Component of Patient engagement	Questions	Mean score	Mean of the components
Communication	Do you feel that your healthcare providers listen to and address your concerns and questions about your health?	3.91	3.88
	How comfortable are you discussing your health concerns with your healthcare providers?	3.86	
Education	Have your healthcare providers provided you with educational materials or resources about your health condition or treatment options?	3.53	3.12
	Do your healthcare providers encourage you to ask questions and seek clarification about your health condition or treatment options?	2.71	
Empowerment	Have your healthcare providers ever encouraged you to take an active role in managing your health?	3.40	3.47
	How confident do you feel in managing your health on your own?	3.54	
Shared Decision Making	Have your healthcare providers ever discussed different treatment options with you and helped you make a decision that was right for you?	2.98	3.26
	Do your healthcare providers respect your preferences and values when making decisions about your care?	3.25	
Health Promotion	Have your healthcare providers discussed healthy lifestyle behaviors with you, such as diet and exercise?	2.80	3.05
	How well do your healthcare providers support and encourage you to engage in healthy behaviours?	3.30	
Patients Right	Do you feel that your healthcare providers advocate for your rights and needs as a patient?	3.14	2.63
	How often do your healthcare providers explain your rights as a patient?	2.13	
Feed Back	Have you ever been asked for feedback on your healthcare experiences?	2.68	3.08
	If you have been asked for feedback, did you feel that your feedback was listened to and acted upon?	3.48	

## Discussion

The study was conducted to assess the patient engagement levels of the healthcare they receive. This is measured through various interactions between health professionals, healthcare workers and patients using WHO recommended seven components. Current study findings were consistent with previous research findings which highlight the importance of patient engagement in patient centered healthcare [4].

Current study provided valuable insights into the perspectives of patient engagement. The communication component of the study received a fairly satisfactory mean score (Mean 3.88). However, it needs further improvements to ensure essential effective communication to build trust between staff and the patients, understand each other's needs and to ensure active participation of the patients for their healthcare.

Patient education and shared decision-making components were given more attention as an important component of the patient engagement [5]. A collaborative approach for decision making will help to increase patient satisfaction, adherence to treatment and for better health outcomes [6]. The moderate mean score for shared decision making (mean 3.26) warrants further improvements of the same. Education (mean 3.12) needs much emphasis in providing health education materials for the patients undergoing treatment, to enhance their knowledge about the ailments they suffer. These materials should be socially and culturally appropriate, understandable easily and ensure accessibility to all patients [7]. These health education materials will also help to understand the health condition of the

patient, advocates for changing lifestyles and also make options for informed decisions about their care.

Another integral component of patient engagement is health promotion. The moderate mean score (mean 3.05) suggests that healthcare providers discuss only some aspects of lifestyle behaviours and that will not be sufficient to change the behaviour of patients. It is required to encourage patients to manage their diet and engage in regular exercises to maintain a healthier life which could be encouraged through health promotion activities.

However, this study reveals that components patient rights (mean 2.63) and feedback (mean 3.08) require, improvements through enhancing knowledge among health workers, providing patient education and about promoting awareness of the rights of the patient [8].

It should be acknowledged that there are certain limitations to this study. The study was conducted in a single government hospital situated in a densely populated district and it limits the generalizability of the findings. Also, since the study was based on self-reported data, social desirability bias and recall bias may have some effects on the findings.

## **Conclusion**

Study shows that communication component where communication among healthcare professionals, other providers and patients is satisfactory up to a certain level (mean=3.8). The least satisfactory is the patient right component, where the rights of the patients should be explained by health staff (mean=

2.6). Since none of the components show highly satisfactory results it is recommended to strengthen efficient patient engagement in healthcare activities by promoting all the seven components of patient engagement.

In conclusion, the study reveals that it is important to promote patient engagement in their healthcare activities to enhance their health status and quality of life. Health professionals should be directed towards advocating patient rights and obtaining

regular feedback from their consumers. They also should provide attractive and informative health education materials. Attention should be made to promote shared decision making and empowering of the patients who will help to ensure patient centered care provision. In healthcare systems prioritizing patient engagement will provide better patient satisfaction, efficient healthcare utilization, improved health outcomes, and reduce financial constraints faced by both hospitals as well as the patients.

### References:

1. Hibbard JH, Greene J, Overton V. Patients with lower activation associated with higher costs; delivery systems should know their patients' 'scores'. *Health Aff (Millwood)*. 2013 Feb;32(2):216-22.
2. World Health Organization. Patient engagement: Technical Series on Safer Primary Care. Geneva: World Health Organization; 2013.
3. Ministry of Health, Sri Lanka. National Health Policy of Sri Lanka. Available from: [https://www.health.gov.lk/moh\\_final/english](https://www.health.gov.lk/moh_final/english)
4. Grol R, Wensing M, editors. *Implementing Patient-Centered Care*. Oxford: Elsevier Health Sciences; 2013.
5. Härter M, van der Weijden T, Elwyn G, Grol R. Shared decision making in Europe: The next steps. *Z Evid Fortbild Qual Gesundheitswes*. 2009;103(5):313-21.
6. Elwyn G, Frosch D, Thomson R, Joseph-Williams N, Lloyd A, Kinnersley P, et al. Shared decision making: A model for clinical practice. *J Gen Intern Med*. 2012 Oct;27(10):1361-
7. Coulter A, Ellins J. Effectiveness of strategies for informing, educating, and involving patients. *BMJ*. 2007 Jul 7;335(7609):24-7.
8. Boulding W, Glickman SW, Manary MP, Schulman KA, Staelin R. Relationship between patient satisfaction with inpatient care and hospital readmission within 30 days. *Am J Manag Care*. 2011 Jan;17(1):41-8.

# Feasibility of Implementing Cluster Laboratory System in Regional Directorate of Health Services, Gampaha district, Sri Lanka

*Jayasundara K M P D, Seneviratne Y G A C, Dharmaratne G S K*

This report was based on the results of a study conducted in 2022 by the authors. The data was collected through a desk review, observations of relevant health institutions, interviews, and discussions with several health staff categories in the Gampaha district health institutions.

## Introduction

The Sri Lankan health system is based on a solid foundation of primary healthcare that has been well recognized globally as a successful low-cost model. In aiming to establish an appropriate primary healthcare model by reorganizing the existing healthcare delivery system, Sri Lanka has embarked on a project; the Primary Healthcare Systems Strengthening Project (PSSP) funded by the World Bank in 2018. One of the key activities of the PSSP is to strengthen the Laboratory Services for Primary Medical Care Institutions (PMCI) (1).

Primary health care was identified as a key priority in the National Health Strategic Master Plan 2016–2025, and in 2018. The Cabinet approved the Policy on healthcare delivery for universal health coverage. This policy introduces the “Shared Care Cluster” system (2). A shared care cluster is defined as a group of health institutions (secondary and primary) linked together to serve a demarcated population (3).

The Ministry of Health has drafted a conceptual framework identifying 6 key

strategies to strengthen the cluster laboratory network (4).

1. To make basic investigations available at the PMCI level
2. To establish sample collecting centers where laboratory facilities or the particular test is not available
3. To deploy point-of-care equipment
4. To utilize mobile laboratories
5. To develop level 2 new laboratories in Divisional Hospitals (DH) for analysis of samples collected from PMCIs
6. To strengthen laboratories at apex institutions

## Profile of Health Institutions of Gampaha District

Gampaha District is one of the three districts of the Western Province of Sri Lanka with a land area of 1387 Sq.km. and a population of 2.4 million, which is the highest populated district in the country (12.3% of the total population of the country). There are 7 shared care clusters in Gampaha District (5).

Table 1: Distribution of government healthcare institutions in Gampaha district

<b>Line Ministry Institutions in Gampaha District (5)</b>	<b>Provincial Ministry Institutions in Gampaha District (60)</b>
<ul style="list-style-type: none"> <li>• Teaching Hospital Ragama</li> <li>• Rehabilitation Hospital Ragama</li> <li>• District General Hospital (DGH) Negambo</li> <li>• National Hospital for Respiratory Diseases Welisara</li> <li>• Divisional Hospital Kandana</li> </ul>	<ul style="list-style-type: none"> <li>• 1 - DGH Gampaha</li> <li>• 4 - Base Hospitals (BH Wathupitiwela, Mirigama, Minuwangoda, Kiribathgoda)</li> <li>• 10 - Divisional Hospitals (DH)</li> <li>• 45 - Primary Medical Care Units (PMCU)</li> </ul> <p>Under the management of Regional Director of Health Services (RDHS) Gampaha</p>

## Results

At present, all tertiary care, secondary care, and two primary care (DH Dompe and DH Divulapitiya) institutions of the Gampaha district are equipped with laboratories.

The RDHS Gampaha has made a commendable effort to establish a cluster laboratory system in the Gampaha district.

Figure 1

However, several gaps were identified that need practical and feasible interventions to implement a sustainable system.

Deficiencies were noted in all layers of a cluster; PMCI, Transportation, Apex hospital (Figure 1)



The deficiencies identified were grouped into 4 key categories,

1. Human resources
2. Infrastructure
3. Supplies
4. Procedures and Policies

Table 2. Deficiencies at the PMCI level

<b>Human Resources</b>	<b>Infrastructure</b>	<b>Supplies</b>	<b>Procedures /Policies</b>
Inadequate nursing staff for phlebotomy  Inadequate supporting staff  Staff training gaps  Poor Attitude/Commitment	Non-availability of proper sample collection rooms  Lack of sample storage facility  Lack of a communication channel	Inadequate supply of consumables for blood collection	<ul style="list-style-type: none"> <li>• Collection</li> <li>• Preparation</li> <li>• Storage</li> <li>• Handing over to transport</li> <li>• Receipt of lab reports</li> <li>• Distribute reports to patients</li> </ul> Supervision process Quality assurance Performance assessment

Table 3. Deficiencies of transportation of specimens and delivery of reports

<b>Human Resources</b>	<b>Infrastructure</b>	<b>Supplies</b>	<b>Procedures /Policies</b>
No assigned staff for specimen transport and report delivery  Shortage of staff  Lack of interest in some staff categories	Lack of vehicles for transporting specimens <ul style="list-style-type: none"> <li>• Motorbikes</li> <li>• Three wheelers</li> <li>• Ambulance</li> </ul> Sample storage facility during transport  Lack of a Communication channel	Fuel for transport vehicles  Spare parts for vehicles	Non-availability of a defined mechanism for, <ul style="list-style-type: none"> <li>• Accepting samples to transport</li> <li>• Transport schedule</li> <li>• Handing over to Apex</li> <li>• Receipt of lab reports</li> <li>• Delivery to PMCI</li> </ul> Maintenance of vehicles  Staff recruitment barriers Extra duty payment issues Supervision/ Monitoring Quality assurance

Table 4. Deficiencies at Apex Hospitals

<b>Human resources</b>	<b>Infrastructure</b>	<b>Supplies</b>	<b>Procedures/ Policies</b>
<p>Inadequate laboratory staff</p> <ul style="list-style-type: none"> <li>• Medical Laboratory Technologists</li> <li>• Lab orderlies</li> <li>• Healthcare Assistants</li> </ul> <p>Poor attitude/commitment of some staff to initiate the system</p>	<p>Inadequate space in the Laboratories</p> <p>Lack of Laboratory Information Management System (LIMS)</p> <p>Lack of a communication channel with PMCIs</p> <p>Lack of report printers</p>	<p>Inadequate supply of lab reagents and consumables</p> <p>Inconsistent supply of reagents/consumables</p> <p>Spare parts for laboratory equipment</p>	<p>Non-availability of a defined mechanism for,</p> <ul style="list-style-type: none"> <li>• Accepting samples for testing</li> <li>• Handingover lab reports to a transporter</li> <li>• Record keeping</li> <li>• Communicating urgent results to PMCIs</li> </ul> <p>Equipment maintenance Supervision process</p> <p>Quality assurance</p> <p>Performance assessment</p>

The four priority problems to be addressed are,

1. Non-availability of a specimen transport and report delivery mechanism within a cluster
2. Lack of nursing staff to perform phlebotomy at PMCUs
3. Inadequate and inconsistent supply of laboratory reagents to apex hospitals
4. Shortage of Laboratory staff at apex hospitals

### **Conclusion**

Establishing the cluster laboratory system in RDHS Gampaha needs a multi-faceted approach addressing problems related to human resources, specimen transport, infrastructure, supplies, standard laboratory procedures, and government policies.

### **References**

1. Thekkur P, Fernando M, Nair D, Kumar AMV, Satyanarayana S, Chandraratne N, et al. Primary Health Care System Strengthening Project in Sri Lanka: Status and Challenges with Human Resources, Information Systems, Drugs and Laboratory Services. Healthc Basel Switz. 2022 Nov 10;10(11):2251.
2. Perera S, Nieveras O, Silva P de, Wijesundara C, Pendse R. Accelerating reforms of primary health care towards universal health coverage in Sri Lanka. WHO South-East Asia J Public Health. 2019 Jan 1;8(1):21.

3. Ediriweera DS, Karunapema P, Pathmeswaran A, Arnold M. Increase in premature mortality due to non-communicable diseases in Sri Lanka during the first decade of the twenty-first century. *BMC Public Health*. 2018 Dec;18(1):584.
4. Division of Laboratory Services, Ministry of Health, Sri Lanka. **GUIDELINES: Strengthening Laboratory Services in Primary Health Care Institutions, Concept Note and Guidelines**. Sri Lanka; 2019. 8–11 p.
5. Planning Unit, RDHS Gampaha. **Reorganizing Primary Health Care Services Project, GAMPAHA District 2019-2023**. PowerPoint presented at; 2023 Apr 1; Planning Unit, RDHS Gampaha.



# Complaint Book Grievance Management Process at District General Hospital Avissawella

*Sandanayake A P, Wellala E*

## Abstract

**Introduction:** Hospitals function with scarce resources. At the operational level, the middle managers such as nursing sisters and in-charge nurses often find themselves struggling to maintain the day-to-day services despite shortcomings. With limited authority in decisions regarding resource allocation, these managers have to communicate these deficiencies to hospital directors regularly. In Sri Lanka a 'complaint book' is used as the means of communication.

**Objectives:** To describe the complaint book grievances management process at DGH Avissawella, including the recently introduced progress review practice.

**Methods:** Descriptive cross-sectional study. Eight units with the highest number of grievances were selected for the study and a desk review of complaint books was conducted. A survey among nursing sisters/ward in-charges was carried out using a self-administered questionnaire.

**Results:** Complaint book grievance management process followed a hierarchical approach. Complaints written by the nursing managers were forwarded through the matrons to the director/deputy director. Lack of an authorized/printed format for writing complaints, absence of explicit language guidelines and the absence of complaint categorization were noted as limitations.

Middle level managers perceive that the deficiencies in the grievance management

process including inefficient maintenance of equipment and infrastructure have a negative effect on ward work. Regular review of the process is considered as an effective way to improve the process.

**Recommendations:** Implementing standardized formats, providing language guidelines, and introducing categorization systems were recommended. Recently introduced review process should be continued.

## Introduction

Sri Lankan healthcare delivery system, like many others around the globe, faces immense challenges arising from the limitation of essential resources. At any given time, scarcity of manpower, material, machinery, methods, minutes, and information is not uncommon due to shortages, breakdown of equipment/infrastructure, lack of skilled staff, flawed processes etc. In this backdrop, the responsibility of providing uninterrupted services of acceptable quality falls on hospital managers. (World Health Organization Regional Office for South-East Asia, 2021; University of North Dakota, 2023; Ostertag, et al., 2021)

Nursing Sisters (N/S) and Nursing Officers (N/O) are often called upon to perform a dual role in a hospital setup. They execute the technical role of nursing care and function as middle level managers performing administrative activities. Be it an Outpatient Department (OPD), wards, operating theatres, Intensive Care Units

(ICU) etc. they hold the responsibility of ensuring that medical staff is provided with necessary resources required for patient care. (University of North Dakota, 2023; Agency for Healthcare Research and Quality, 2012)

Hence, functioning at the impact end of the spectrum, these managers are often put under immense pressure. Added to this is the limited authority they possess in deciding resource allocation and acquisition. Hence, when faced with such situation, they are frequently forced to communicate their grievances to top management for resolution (University of North Dakota, 2023; Agency for Healthcare Research and Quality, 2012; Ostertag, et al., 2021; Labrague, et al., 2018).

In an emergency, these communications may occur via a phone call. However, in Sri Lankan hospital setup a 'complaint book' has been used as a means of grievance communication for decades. In addition to being an operational necessity, a written grievance provides a legal foundation for future procurement and purchasing of any goods or services which may be required for the resolution of such grievances.

The process originates from where the grievance arises; often in a ward/ unit and frequently refers to a resource deficiency. It is typically documented by a managerial-level staff member, i.e. nursing, medical or paramedical. The grievance is often forwarded to the Hospital Director.

Hospital management will use it as a means of providing necessary directions to relevant parties including maintenance unit, overseers, accountant, and administrative officers. Thus, the complaint book becomes a means of interpersonal communication between multiple parties.

This entire process is documented thus providing an ideal means of monitoring and evaluation. However, in the majority of instances, this process seems to conclude with no such review process and the communication loop is abruptly terminated without feedback.

### **Justification**

At District General Hospital (DGH) Avissawella, in September 2020, a process of reviewing the complaint books commenced in the form of a meeting thus adding feedback to complete the loop. A total of three review meetings were held. Individual grievances were analysed to study the progress of resolution. Where required, directives necessary to expedite the process were given to those responsible. The participation at the meetings was high with almost all ward managers being present.

However, this initiative, with no documented precedence needed to be reviewed, together with the entire complaint book grievance management process, to make adjustment for improvement.

### **General Objective.**

To describe selected aspects of the complaint book grievances management process at DGH Avissawella.

### **Specific Objectives:**

1. To describe the complaint book grievance management process.
2. To describe the types of grievances communicated by complaint books.
3. To assess the nursing sisters' perception regarding the complaint book grievance management process including the review meetings.

### **Methodology;**

Descriptive cross-sectional study. The study setting was the Avissawella District General Hospital. Study period was May 2022 to April 2023. Study units were selected based on the number of grievances recorded in complaint books during the study period (highest eight units).

Step 1- Complain books of selected units were desk reviewed using thematic analysis.

Step 2- A survey was carried out among nursing sisters/ ward in-charges using a self-administered questionnaire (Population size = 23).

The nominal data was described using qualitative methods.

## Results:

### **1. Description of the Complaint Book Grievance Management Process:**

1.1 Complaints primarily written by the nursing sisters, ward in charges and nursing officers are forwarded through the matrons to the director/ deputy director. These grievances are then referred to the relevant department/ unit / personals (e.g., maintenance unit/ overseeretc.) for necessary action (figure 1).

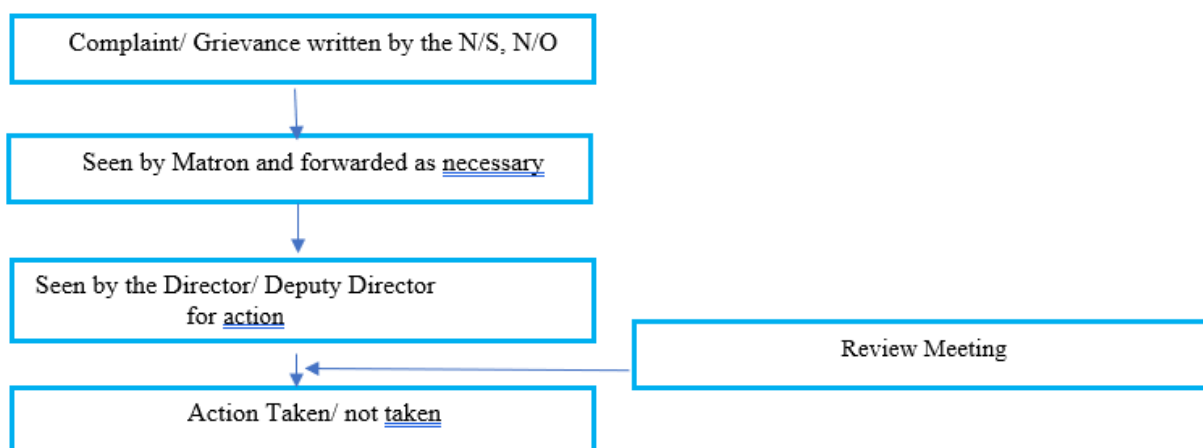


Figure 1: complaint book grievance management' process at DGH Avissawella.

During the review meetings each grievance is individually analyzed to identify the state of resolution and any existing delays/ constraints. Way forward is discussed, and necessary instructions given.

1.2 Following issues were noticed during the desk review

- a. Lack of an authorized/ printed format to write complaints. Hence, any available book was used as the complaint book.
- b. Notes were made in either Sinhala or English, in a manner preferred by the user.
- c. Same complaint written several times.
- d. All categories of complaints written in a single book.

### **2. Description of the types of grievances communicated by complaint books.**

During the study period a total of 638 grievances were communicated. Among them 6.8% (n=44) referred to lack of resources and 52.0 % (n=332) were maintenance requests (Table 1).

Type of Grievance	Number Reported
Lack of Resources	44
Maintenance Requests	332
Miscellaneous	262
Total	638

Table 1; Type of Grievances Reported

Among the reported resource scarcities, non – Medical Equipment and Furniture constituted the majority (75%, n=33) (Table 2).

Type of Reported Resource Scarcity	Number Reported
Human Resources	2
Medical Equipment	9
Utility and Ancillary Services	0
Non-Medical Equipment & Furniture	33
Total	44

Table 2; Type and Number of Resource Scarcities Reported

Among the maintenance requests 58.4% (n=194) were for medical and non- medical equipment (Table 3). Multi Para Monitors (n=12), Sterilizers (n=5) Defibrillators (n=4), Ventilators (n=4) and Diathermy Machines (n=4) were the medical equipment mentioned most frequently. Infrastructure maintenances included repairs to doors and windows (n=23) and roof (n=13). Among the services plumbing (n=30), Telephone (n= 25) and electricity (n=24) formed the majority.

Type of Maintenance Related Grievance	Number Reported
Medical Equipment	83
Non-Medical Equipment	111
Infrastructure	64
Utility and Ancillary Services	74
<b>Total</b>	<b>332</b>

Table 1; Type and Number of Maintenance Related Grievances Reported

In addition, there were 262 miscellaneous items reported (Table 1). These included requests for local purchase of drugs, consumables (e.g. linen, polythene), other minor items (e.g. rechargeable torch, white board) and difficulties caused by stray dogs etc.

### 3. Results of the survey among nursing sisters/ ward in charge nurses.

Twenty out of 23 subjects responded to the questionnaire. Response rate was 86.9%. Results are summarized in figure 2

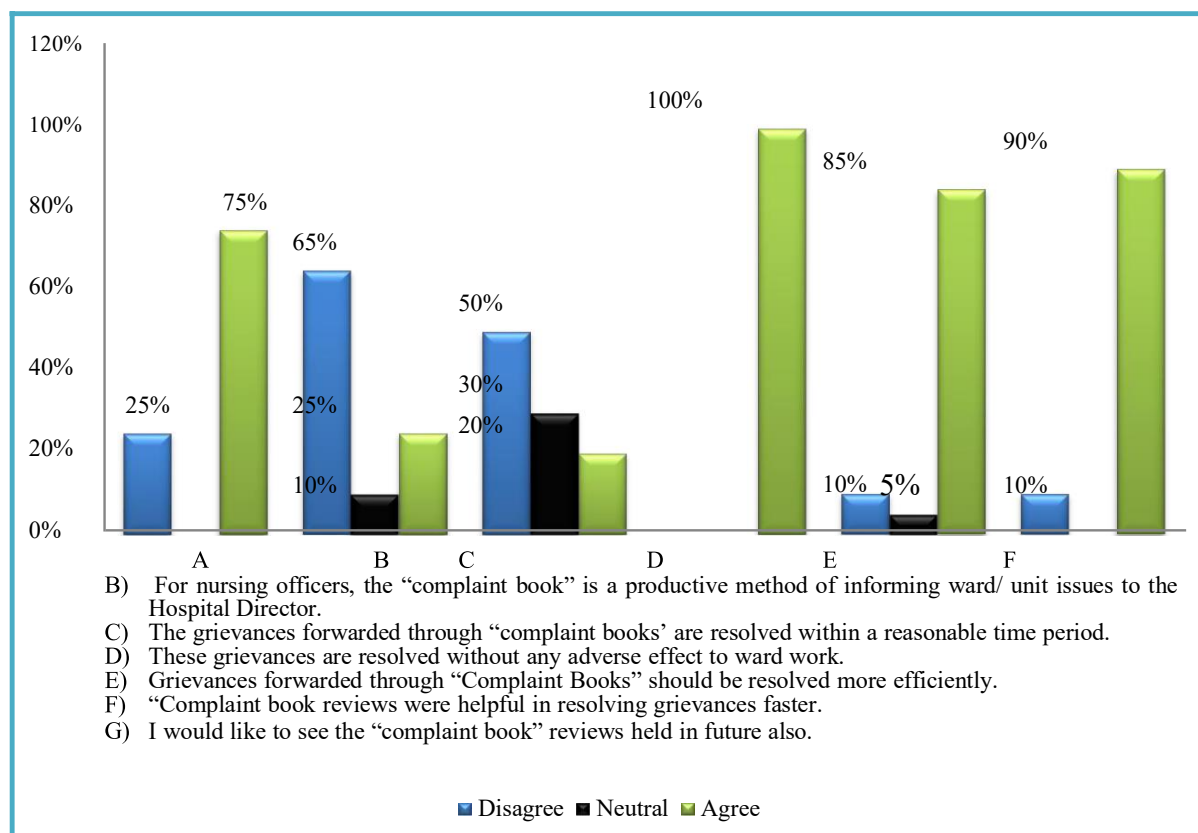


Figure 2; Results of the survey on the Complaint Book Grievance Management process

(For descriptive purposes responses strongly agree and agree were amalgamated as ‘Agree’ and responses disagree and strongly disagree were amalgamated as ‘disagree’).

Accordingly, a majority of participants (75%, n=15) agreed that the complaint book offered a productive method of communication between the ward staff and the administration. However, 65% (n=13) perceived that grievances are not resolved in time and adversely affected ward work (50%, n=10). There was unanimous

agreement that the grievances should be resolved more efficiently.

Among the participants, 85% (n=17) were of the view that the complaint book reviews were helpful in resolving the grievances faster and 90% (n=18) wanted the reviews to continue in the future.

## **Discussion:**

Study aimed at examining the complaint book grievance management process at DGH Avissawella, focusing on describing the process, types of grievances communicated and process review. It also assessed nursing managers' perception on the above process. The findings highlighted several important areas which required improvement.

Complaint book grievance management process followed a hierarchical approach. Complaints were initially written by the nursing managers were forwarded through the matrons to the director/deputy director. These findings align with the existing literature on grievance management in healthcare organizations, which emphasizes the importance of establishing clear channels for reporting and addressing grievances. (Ministry of Health and Family Welfare, Government of India; n.d; Putturaj, et al., 2021) Involvement of multiple levels of authority ensures that grievances are appropriately mitigated and addressed.

Nevertheless, the study identified several issues that require attention. Firstly, the lack of an authorized/ printed format for writing complaints led to the use of any available book in the ward as the complaint books. This lack of standardization may result in irregularities in documenting and addressing grievances. Previous literature states that standardized documentation formats, contributes to improved clarity, accuracy, and accountability in management processes. (Pavinee, 2023; Asian Development Bank, 2010) Introducing an authorized, uniform format would enhance the effectiveness of the process.

Secondly, the complaints were written in either Sinhala or English based on the user's preference. This may create difficulties in understanding and processing the complaints. Standardizing the language used for documentation would enhance clarity and streamline the process. This finding supports previous studies highlighting the need for standardized communication process in healthcare settings to ensure clear and consistent information exchange. (Morrow, et al., 2012; Vermeir, et al., 2015)

Furthermore, the absence of categorization in the complaint book was noted. All categories of complaints were written in a single book, making it challenging to identify and prioritize specific types of grievances. Previous studies recommend the use of categorization systems to classify and prioritize grievances. (Bayer, et al., 2021) Implementing such a system would facilitate easier identification, prioritization, and rapid action, enhancing efficiency in the system.

The study also revealed that a significant majority of the grievances were related to maintenance requests rather than resource scarcity. These findings are consistent with prior research highlighting the importance of maintaining equipment and infrastructure in healthcare settings. (Bahreini, et al., 2018; Jamshidi, et. Al., 2014) Addressing maintenance requests promptly and efficiently is crucial to ensure a smooth workflow and providing optimal healthcare in a resource constraint setting.

The survey conducted among nursing sisters/ward in-charges provided insights into their perception. A majority agreed that complaint books offered a productive method of communication between the

ward staff and the administration. These findings align with previous studies highlighting the significance of effective communication channels for grievance resolution in healthcare organizations. (Elbaz, et al., 2020)

However, the survey also highlighted some areas of concern. A significant proportion of participants expressed dissatisfaction or neutrality regarding the resolution of grievances within a reasonable period and the adverse effects of unresolved grievances on ward work. Majority was in agreement that the complaint review process would help resolve the grievances faster.

### **Conclusions:**

The purpose of this research was to describe the complaint book grievances management process at DGH Avissawella, with special reference to the progress review. Based on the findings, it can be concluded that while the existing hierarchical approach with clear channels

of reporting offers an effective communication between stakeholders, setbacks such as lack of standardized documentation formats, non-categorization and absence of language guidelines exist within the system. Middle level managers perceive that the deficiencies in the grievance management process have a negative effect on ward work. Regular review of the process is considered as an effective way for improvement.

### **Recommendations:**

Implementing standardized formats, providing language guidelines, and introducing categorization systems would improve the efficiency and effectiveness of the complaint management process, leading to better communication, timely resolution of grievances. Regular reviews of the grievance management process should be continued while making feedback from middle level managers an important consideration in future system improvements.

### **References;**

1. Agency for Healthcare Research and Quality. (2012). *CUSP Toolkit, The Role of the Nurse Manager, Facilitator Notes*. Retrieved 2023, from [https://www.ahrq.gov/hai/modules/nursing/nursing notes.html#:~:text= Nurse%20managers% 20are%20 responsible% 20for,with%20the%20hospital's %20strategic%20goals](https://www.ahrq.gov/hai/modules/nursing/nursing%20notes.html#:~:text=Nurse%20managers%20are%20responsible%20for,with%20the%20hospital's%20strategic%20goals).
2. Asian Development Bank. (2010). *Designing and Implementing Grievance Redress Mechanisms*. Retrieved April 20, 2023, from <https://www.adb.org/sites/default/files/institutional-document/32956/files/grievance-redress-mechanisms.pdf>
3. Bahreini, R., Doshmangir, L., & A, I. (2018). *Affecting Medical Equipment Maintenance Management: A Systematic Review*. Retrieved May 5, 2023, from [https://www.researchgate.net/publication/324924732\\_Affecting\\_Medical\\_Equipment\\_Maintenance\\_Management\\_A\\_Systematic\\_Review](https://www.researchgate.net/publication/324924732_Affecting_Medical_Equipment_Maintenance_Management_A_Systematic_Review)
4. Bayer, S., Kuzmickas, P., Boissy, A., Rose, S., & Mercer, M. (2021). *Categorizing and Rating Patient Complaints: An Innovative Approach to Improve Patient Experience*. Retrieved May 1, 2023, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8205334/>

5. Elbaz, A., Salem, I. O., & Saaban, M. (2022). *Hearing employee voice and handling grievance: Views from frontline hotel and travel agency employees*. Retrieved May 1, 2023, from <https://www.sciencedirect.com/science/article/abs/pii/S0278431922001736>
6. Jamshidi, A., & D, A.-K. (2014). *Maintenance of Medical Devices; A Literature Review*. Retrieved April 30, 2023, from [https://www.academia.edu/11606726/Maintenance\\_of\\_Medical\\_Devices\\_A\\_Literature\\_Review](https://www.academia.edu/11606726/Maintenance_of_Medical_Devices_A_Literature_Review)
7. Labrague, L., McEnroe-Petite, D., Leocadio, M., & Bogaert PV, C. G. (2018). *Stress and ways of coping among nurse managers: An integrative review*. Retrieved May 30, 2023, from Stress and ways of coping among nurse managers: An integrative review
8. Ministry of Health and Family Welfare, Government of India. (n.d.). *GUIDELINES FORESTABLISHING GRIEVANCE REDRESSAL AND HEALTH HELPLINE*. Retrieved May 08, 2023, from [https://nhm.gov.in/New\\_Updates\\_2018/NHM\\_Components/Health\\_System\\_Strengthening/ERS/G\\_Guidelines\\_for\\_Establishing\\_Grievance\\_Redressal\\_and\\_Health\\_Helpline.pdf](https://nhm.gov.in/New_Updates_2018/NHM_Components/Health_System_Strengthening/ERS/G_Guidelines_for_Establishing_Grievance_Redressal_and_Health_Helpline.pdf)
9. Ostertag, K., Bratan, T., & Jung, AC. (2021). *Healthcare sector: Conserving resources improves health and environmental protection and lowers costs*. Retrieved May 14, 2023, from <https://www.isi.fraunhofer.de/en/presse/2021/presseinfo-02-ressourcenschonung-im-gesundheitssektor.html>
10. Pavinee, N. (2023). *Document Standardization; Definitions, Best Practices and Benefits*. Retrieved April 24, 2023, from <https://www.assai-software.com/document-standardization-definitions-best-practices-and-benefits/#:~:text=Document%20standardization%20is%20not%20only,consistent%2C%20and%20easy%20to%20understand.> 20
11. Putturaj, M., Belle, S., Engal, N., & Criel, B. (2021). *Multilevel governance framework on grievance redressal for patient rights violations in India*. Retrieved April 23, 2023, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7611949/>
12. Vermeir, P., Vandijck, D., Degroote, S., Peleman, R., Verhaeghe, R., Mortier, E. H., et al. (2015). *Communication in healthcare: a narrative review of the literature and practical recommendations*. Retrieved May 1, 2023, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4758389/>
13. World Health Organization Regional Office for South-East Asia. (2021). *From Sri Lanka Health system Review*. Retrieved May 12, 2022.



# Responsiveness in healthcare at Lanka Hospitals, Colombo: A review

*Senevirathne Y G A C, Jayasundara K M P D, Dharmarathne G S K*

## Introduction

Responsiveness is how well the health system meets the legitimate expectations of the population for the non-health enhancing aspects of the health system. Responsiveness is one of the three intrinsic goals of health system performance measurement (1). Consumers say that in addition to making them healthier, the health system should treat them with dignity, facilitate their role in decision-making, provide clear communication with their health care providers, and ensure that their medical encounters are kept confidential (2). World Health Report 2000 has categorized the elements of responsiveness into two clusters.

### 1. **Respect for persons.**

- *Respect for the dignity of the person.*
- *Confidentiality, or accessibility to one's personal health information.*
- *Autonomy to participate in choices about one's own health.*

### 2. **Client orientation.**

- *Prompt attention.*
- *Amenities of adequate quality, such as cleanliness, space, and hospital food.*
- *Access to social support networks.*
- *Choice of provider.*

The elements of **client orientation** have more economic implications; it generally costs more to assure quick attention and to offer high quality food, more space and well-kept facilities (1). In contrast, the elements of

**respect for persons** can be costless, apart perhaps from some training of providers and administrators. These elements respect for dignity, autonomy, and confidentiality show no relation to health system spending.

## Lanka Hospitals at a glance.

Lanka Hospitals is a 367-bed multi-specialty hospital spread over 350,000 square feet with 7 acres of beautifully landscaped garden (3). It provides a complete range of the latest diagnostic and high-end medical technology. Hospital's 11-storey structure is complete with a helipad and equipped for air-ambulance services. They offer emergency care, laboratory and testing services, pharmacy, and other vital services around the clock for patients seeking urgent medical attention.

At the end of 2020, the hospital achieved a customer satisfaction rating of 98%.

## The Review

This review is based on the three-day visit in September, 2021 to Lanka hospital. Observations, enquiries, discussions, participation in real cases (blood sample testing) were the methods used for data collection.

Domain & Element	Comments
1. Dignity	<ul style="list-style-type: none"> <li>• Greeted respectfully by reception and front desk staff; Body language and tone of voice are very pleasing. An efficient customer service department is in place.</li> <li>• Separate consultation, treatment and examination areas are available at OPD and ETU; Patient privacy respects.</li> <li>• Informed consent is obtained for all examinations, investigations, and treatments.</li> <li>• Consent forms are mostly provided in English at surgical wards. There are communication barriers with Tamil speaking patients.</li> </ul>
2. Confidentiality	<ul style="list-style-type: none"> <li>• Patient is ensured to talk privately to the doctors in OPD, ETU and Wards.</li> <li>• Patients' personal information is kept confidential; all records are kept in a covered file and given to the patient.</li> <li>• Computer access given to authorize persons only. After the session ends, the computer is logged off.</li> <li>• Staff have not disclosed any patient information on social media</li> </ul>
3. Autonomy	<ul style="list-style-type: none"> <li>• All financial information regarding room rates, packages, investigation costs and insurance schemes are provided to the patients; Special financial information center helps them.</li> </ul>
4. Prompt attention	<ul style="list-style-type: none"> <li>• Most of the equipment and essential drugs arrange according to JCI standards. Treatment room in ETU categorized into green, yellow, and red to provide the care with proper triage. Treatment algorithms and checklists have put in correct places and update regularly.</li> <li>• Separate patient transport department is available and ready with comfortable trolleys and wheelchairs.</li> <li>• Waiting time for specialist consultation may take longer time; most of the specialists do not comply with session commencing time – delayed arrival.</li> </ul>
5. Amenities of adequate quality	<ul style="list-style-type: none"> <li>• Lanka Hospitals has ample car park space and handling staff. The hospital garden has created a landscaped and beautiful environment and provides great mental relief to the clients.</li> <li>• Cleanliness of the garden, patient waiting areas, patient consultation areas, wards and rooms are maintained well.</li> <li>• Hospital map, direction, and sign boards (in three languages: Sinhala, English, and Tamil) provide easy navigation to the customers. Colors and visual effects are used optimally.</li> <li>• Every floor has cleaned and adequate washroom facilities.</li> </ul>

---

	<ul style="list-style-type: none"> <li>• Drinking water facility is provided for the visitors. But no drinking cups or glasses are provided.</li> <li>• Colour coded waste bins are provided to ensure proper waste disposal.</li> <li>• The cafeteria is built so that customers can get food and spendtime with their companions.</li> </ul>
6. Access to social support networks	<ul style="list-style-type: none"> <li>• Patients' welfare is served in many ways: ease of having family and friend visit, facilities available to stay contact with the outside world, opportunities given for religious/cultural activities.</li> </ul>
7. Choice of provider	<ul style="list-style-type: none"> <li>• Patients able to choose specialist for consultation.</li> <li>• In the OPD there is only one medical officer available for consultation and, hence patients must get treatment without choice.</li> </ul>

---

### Conclusion

The Lanka Hospitals has obtained and maintained high level of responsiveness in all seven elements. This reflects the corporate governance structure and the leadership, high quality facilities and technology,

commitment of the Quality Management team and the employees.

It is evident the fact that mentioned in the world health report 2000, the elements of client orientation greatly link with the high-quality facilities and services provided.

### Reference

1. WHO W. The World Health Report 2000.
2. Darby C, Valentine N, Murray CJ, de Silva A. World Health Organization (WHO): Strategy on Measuring Responsiveness.
3. About Lanka Hospitals [Internet]. [cited 2021 Sep 16]. Available from: <http://www.lankahospitals.com/en/about-lanka-hospitals/>

# **A review on the service utilization of the National Poisons Information Centre**

**Attanayake H., Wickremasinghe K.**

## **Abstract**

**Introduction:** The National Poisons Information Centre (NPIC) is the only facility in Sri Lanka to provide life-saving scientific information on poison exposures.

**Objective:** This study aimed to describe the service utilization of the NPIC.

**Methods:** This was a case study. Empirical data collection was carried out in early 2023. Service utilization was described by analyzing secondary data in the past records, and empirical data gathered through key informant interviews (KII) and observations.

**Results:** NPIC has received the highest number of enquiries (n= 2190, 98.87%) as telephone calls in the year 2022. All such telephone enquiries have been on poison exposures. Requests for awareness programmes (n=7) have been less than 1% of the total information requests. Government doctors have accessed NPIC the most (n = 2186, 99.82%), whereas the victims of poison exposure (n=1) and family members (n=3) have enquired less than 1% of the total enquiries. Most (n=817, 37.3%) of the telephone enquiries had been on pesticide poisoning. The proportion of enquired cases of pesticide poisoning out of the total number of pesticide poisoning cases reported in Sri Lanka between 2016-2019 has been 1%-3%.

## **Conclusion and recommendations**

The study concluded that the service utilization of the NPIC is evidently low. Difficulties encountered in accessing NPIC especially during peak hours, poor community awareness, and inadequate numbers of doctors were identified as major causes for the low utilization. It is recommended to facilitate easy access to NPIC, revise cadre requirement for doctors, and improve community awareness in a view of improving service utilization as at present. It is also recommended to conduct a technological assessment on the other options for the provision of poison information such as electronic information resources with artificial intelligence and smart phone applications. A comparative cost benefit analysis between the present system and other options is further recommended.

## **Key words**

**Poison information centre, Toxicology, Service utilization, poisoning, clinical decision support**

## **Introduction**

The National Poisons Information Centre (NPIC) has completed thirty-five (35) years of service since its inception in January 1988. It is the first such centre in South Asia (Fernando, n.d.) Its vision is to become the centre of excellence in controlling the poisoning among South Asian countries. NPIC is on the premises of the National

Hospital of Sri Lanka (NHSL) which is its host Institution.

NPIC provides life-saving scientific information (clinical toxicology information such as hazard identification, clinical features of poisoning, diagnostic criteria, and management protocol) to doctors 24 x 7 for clinical decision support. (*NATIONAL POISONS INFORMATION CENTRE NATIONAL HOSPITAL OF SRI LANKA*, n.d.) NPIC can be accessed by the public through the same poison helpline, Tel: 0112 686 143. Its other functions include training and health promotion.

There are two (02) Medical Officers, two (02) Research Officers, one (01) Development Officer and two (02) Health Assistants working at NPIC. A consultant physician is the head of the institution.

Enquiries to NPIC are registered in a standard data sheet recommended by World Health Organization. Enquiries can be made as telephone calls, e-mails ([npdic.nhs@gmail.com](mailto:npdic.nhs@gmail.com)) or via post. A Medical Officer is always recruited as the informant.

The National Poisons Information Centre maintains an accurate, up-to-date database of almost all poisonous substances in Sri Lanka. It is accessible via [https:// www. toxbase lanka.info](https://www.toxbase.lanka.info). Inter locaters may reach NPIC via social media through the link.

<https://www.facebook.com/NTPIC SL> NPIC also has exclusive access to the United Kingdom toxicology information database and Thailand poisons information network.

### **Objective**

This study aims to describe the service utilization of the National Poisons Information Centre.

### **Methodology**

The study duration was 17.01.2023 – 16.05.2023. Service utilization was described by analysing the NPIC annual reports. Empirical data was gathered through key informant interviews (KII) and observations during site visits. Aggregated national data was collected from the Medical Statistics Unit of the Ministry of Health. The Principal Investigator (PI) collected data. Data was entered manually and electronically. Data analysis was done using Microsoft Excel package 365.

Following data analysis, a workshop was conducted with the participation of the Consultant Physician in charge/NPIC (01), Registrars in Emergency Medicine (02), Medical Officer (01) in NPIC, Research Officers (02) and Development Officer (01) to stabilize the acquired knowledge.

## **Results**

NPIC being the only facility that provides poisons information receives enquiries from all over the island 24 x 7.

**Table 01: Distribution of enquiries from NPIC over the last five years from 2018-2022**

	2018		2019		2020		2021		2022	
	No	%	No	%	No	%	No	%	No	%
<b>Telephone calls</b>	1024	94.03%	1468	96.71%	530	97.25%	2686	99.70%	2190	98.87%
<b>e-mails</b>	40	3.67%	18	1.19%	15	2.75%	8	0.30%	25	1.13%
<b>Post</b>	25	2.30%	32	2.11%	0	0.00%	0	0.00%	0	0.00%
	1089	100.00%	1518	100.00%	545	100.00%	2694	100.00%	2215	100.00%

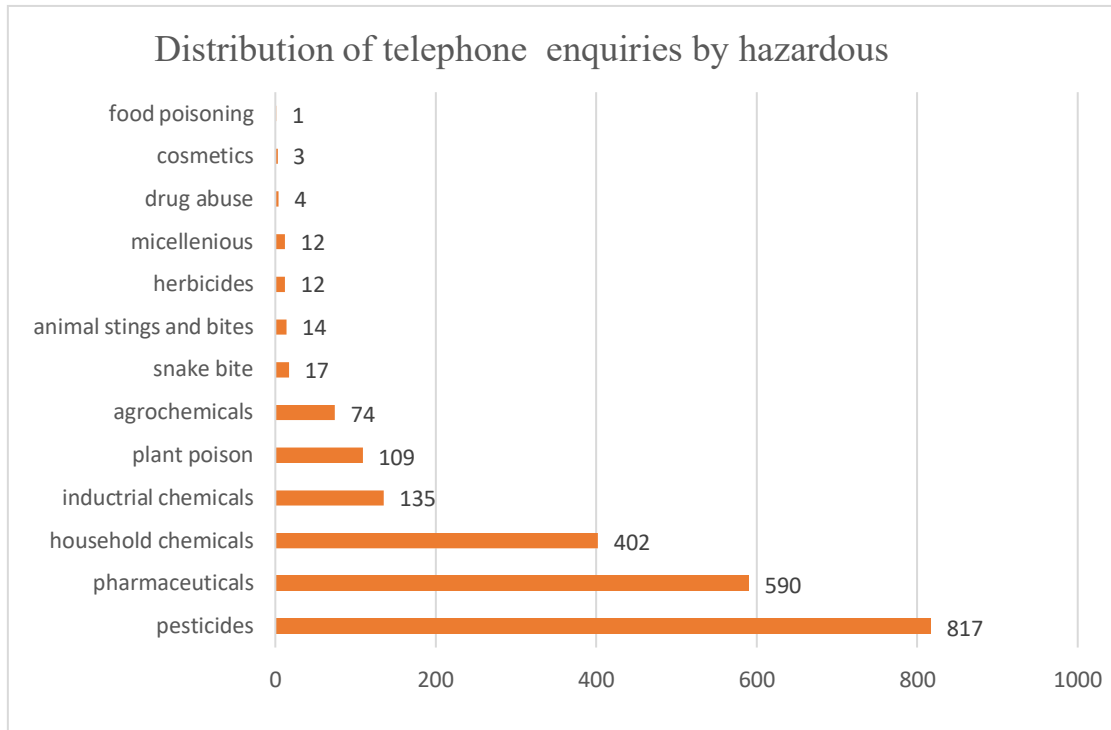
Table 01 above, depicts the distribution of enquiries from 2018 -2022. NPIC has received the highest number of enquiries as telephone calls. The number of telephone enquiries has increased over the years from 2016 through 2022. In 2022, the average number of telephone enquiries received by NPIC per day is six (06) which has ranged between 1-35. It was claimed in a KII with a Medical Officer, that all telephone calls cannot be recorded due to increased workload. As such, the average number of telephone enquiries received by NPIC per day can be more than this computed value. However, this cannot be verified as per the available data.

**Table 02: Distribution of the information requests by the request type in the year 2022**

<b>Request type</b>	<b>Number</b>	<b>%</b>
Poisons exposure	2190	98.87%
Request for educational material	18	0.81%
Request for an awareness programme	7	0.32%
	2215	100.00%

According to table 02 above, most of the information requests have been on poisons exposures. Requests for awareness programmes have been less than 1% of the total information requests.

Figure 01 below is a graph that shows the distribution of telephone enquiries by the hazardous agent in the year 2022.



**Figure 01: Distribution of the telephone enquiries by the hazardous agent in the year 2022**

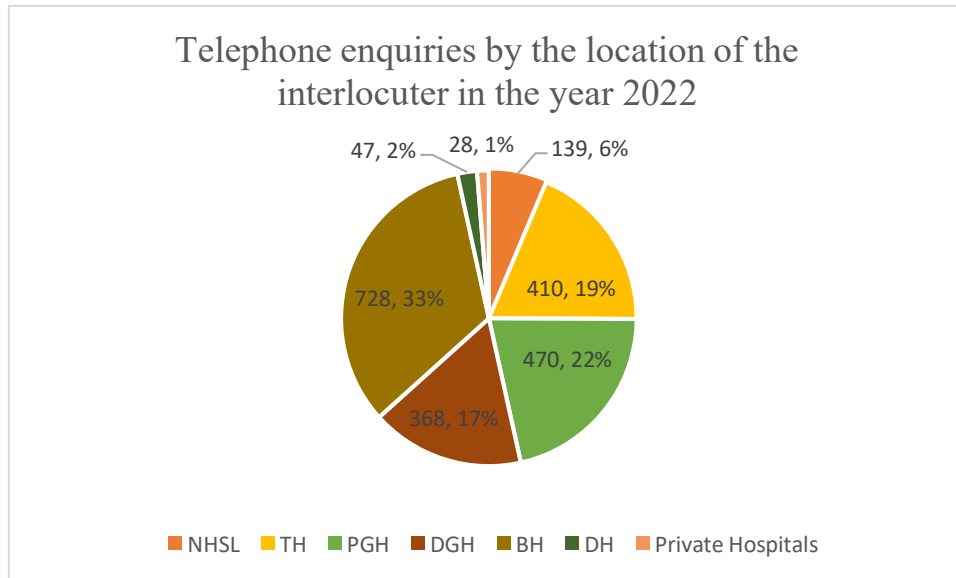
As per the above distribution, most (n=817, 37.3%) of the telephone enquires had been on pesticide poisoning.

**Table 03: Distribution of telephone enquiries by the category of interlocutor in the year 2022**

Category of interlocutor	Number of enquiries	%
Doctor (Government hospital)	2186	99.82%
Victim himself	1	0.05%
Family member of the victim	3	0.14%
Total	2190	100.00%

Table 03 above, describes the distribution of telephone enquiries by the category of the interlocutor. Doctors working in government hospitals have accessed NPIC the most. Victims of poisons exposure and family members of the victim have enquired less than 1% of the total enquiries even when put together.

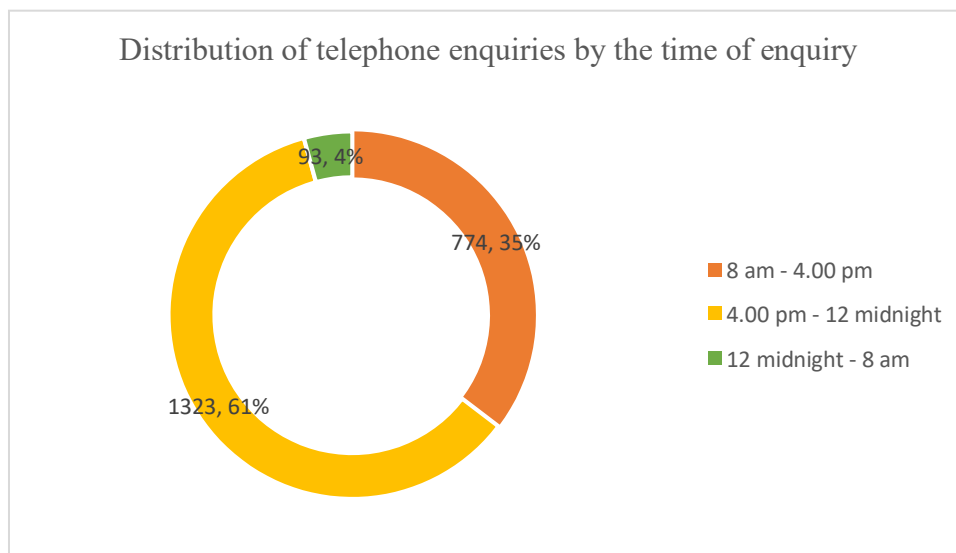
Figure 02 shows the distribution of telephone enquiries by the location of the interlocutor in the year 2022.



**Figure 02: Distribution of telephone enquiries by the location of the interlocuter in the year 2022**

As per the above distribution, most (n=728,33.24%) of the telephone enquiries have been from Base Hospitals; followed by Provincial General Hospitals and Teaching Hospitals respectively.

Figure 03 below, shows the distribution enquiries by the time of enquiry in the year 2022.



**Figure 03: Distribution of telephone enquiries by the time of enquiry in the year 2022**

The number of enquiries received between 4 pm – 12 midnight is twice the number received within the day from 8 am – 4 pm. As such the workload after working hours (8 am -4 pm) is more than in working hours.

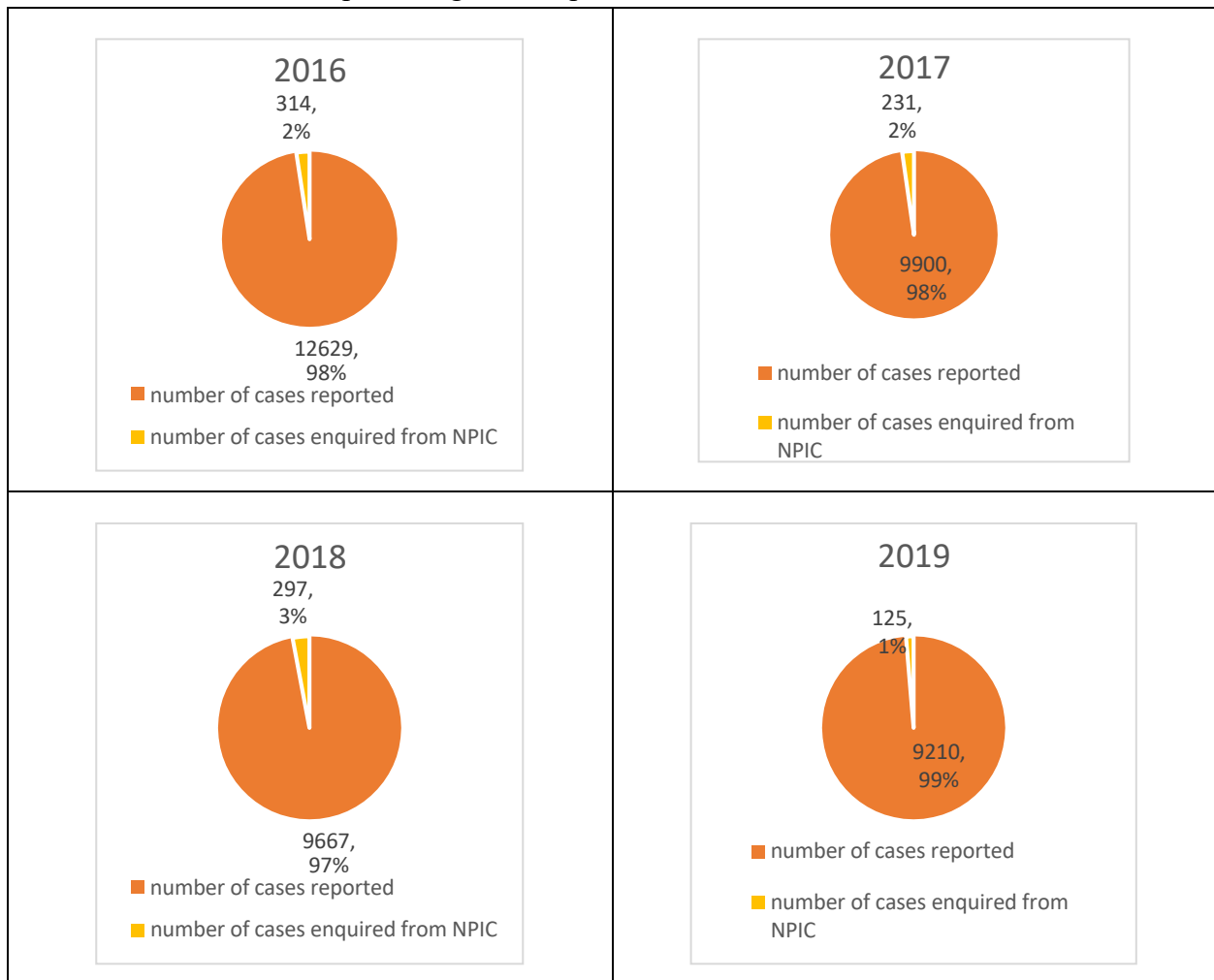


**Table 04: Distribution of telephone enquiries by the clinical outcome in the year 2022**

<u>Patient outcome</u>	<u>Number</u>	<u>%</u>
Recovered	2188	99.91%
Death	1	0.05%
Unknown	1	0.05%
Total	2190	100.00%

As per the above distribution most of the patients whose exposures were enquired from NPIC have recovered from poisons exposure.

Figure 04 is a series of pie charts that show the number of enquiries on pesticide poisoning made from NPIC out of the total poisoning cases reported in Sri Lanka from 2016- 2019.



**Figure 04: Number of enquiries on pesticide poisoning made from NPIC out of the total poisoning cases reported in Sri Lanka from 2016- 2019.**

The proportion of enquired cases of pesticide poisoning out of the total number of pesticide poisoning cases in Sri Lanka between 2016 to 2020 has been between 1%-3%.

## Health Promotion

Table 05 below, summarizes the health promotion activities conducted by NPIC in 2022.

**Table 05: Health promotion activities conducted by NPIC in 2022**

	Activity	Indicator	Quantity	
1	Development of Education Communication Tools to commemorate “National Poisons Prevention Week 2022”	Banners	Number of banners printed	5
		Posters	Number of posters printed in both Sinhala and Tamil	4000
		Leaflets	Number of leaflets uploaded in to face book (in Sinhala, Tamil, and English)	18
2	Updating, publishing, and distributing of the textbook “Management of poisoning”	Number of books distributed in 2022	160	
3	Conduction of special awareness programmes	Number of participants in special awareness programmes (02)conducted in 2022	250	

## Training

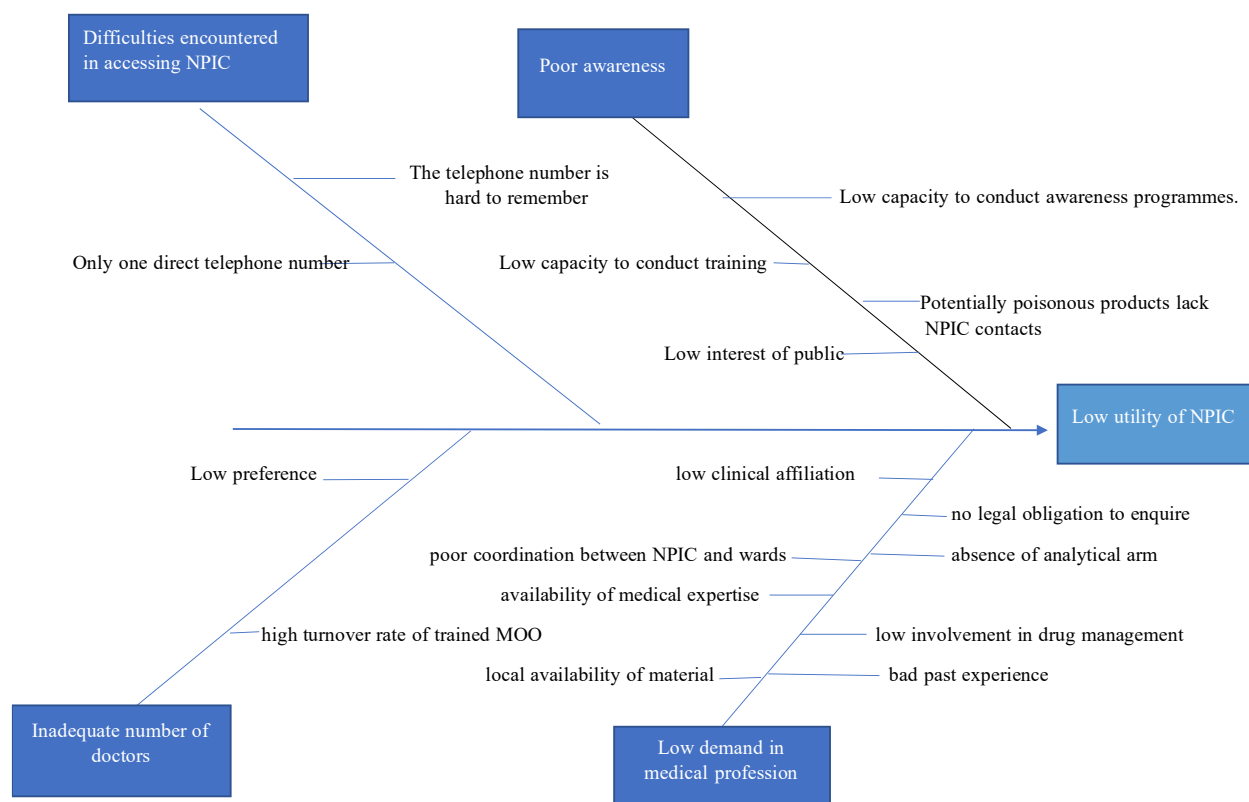
NPIC conducted the following training sessions for the health staff/ professional categories in the year 2022 as summarized below. Table 06 summarizes the training programmes conducted by NPIC in 2022.

**Table 06: Training programmes conducted by NPIC in 2022**

Training Programme	Scope	Duration	Type of participants	Number of participants trained
Post Graduate Training in Medicine	MD in Emergency Medicine	One month	Registrars in Emergency Medicine (Post Graduate Institute of Medicine)	21
	Diploma in Critical Care Medicine	One month	Post Graduate trainees (Post Graduate Institute of Medicine)	12
Undergraduate training	MBBS	One month	Medical Students	130

Diploma Training	Diploma in Occupational Health	One day	University of Colombo	07
Pre-employment training	Acute management of poisoning	One day	Nursing Students in the Nursing Training School	50
Training for armed forces	Acute management of poisoning	One day	Nursing Trainees (Sri Lanka Navy)	20
		One day	Medical Assistants (Sri Lanka Air Force)	30
		One day	Medical Assistants (Sri Lanka Navy)	15

The above results were presented to a group comprised of Consultant Physician in charge/NPIC (01), Registrars in Emergency Medicine (02), Medical Officer (01) in NPIC, Research Officers (02) and Development Officer (01). It was observed that the service utilization of the NPIC is evidently low. A silent brainstorming session was conducted to work out the root causes of the problem. The findings are presented in a problem tree.



There were four (04) major causes for the low utility.

1. Difficulties encountered in accessing NPIC specially during peak hours
2. Poor awareness of the NPIC in the community
3. Low demand in medical profession for decision support from NPIC
4. Inadequate number of doctors

## Discussion

The service utilization of the NPIC is evidently low. This finding is supported by a study done on the utilization of the poison information resources in Australia and New Zealand, which concluded that poison information centers were the least utilized resource in both countries (Fountain et al., 2014). In the contemporary scenario, people prefer to access Artificial Intelligence (AI) enhanced information resources over contacting an information centre via phone call which is perceived to be a time-intensive, cumbersome endeavour.

Difficulties encountered in accessing NPIC, especially during peak hours, make the job tougher. Poor awareness in the community on NPIC services too affects utilization. It was claimed in the KII, that the average number of telephone enquiries per day could be more than the computed value (n=6) as some calls may get missed or not recorded (even if attended) due to the increased workload. As

only two (02) doctors are deployed, one doctor must cover on-call duties every other day. As such there is a possibility for the increased workload. Thus, the workload of doctors needs to be objectively verified.

## Conclusions and Recommendations

The service utilization of the NPIC is evidently low. It is recommended to facilitate easy access to NPIC, by providing a number which is easily remembered. The telephone helpline should be displayed on potentially poisonous products to improve awareness. A workload assessment of doctors must be done in a view of revising the cadre. It is also recommended to conduct a technological assessment of the other options for the provision of poison information such as electronic information resources with artificial intelligence and smart phone applications. A comparative cost-benefit analysis between the present system and other options is further recommended.

## References

- 1) Fernando, R. (n.d.). *National Poisons Information Centre in a Developing Asian Country-The First Years' Experience*.
- 2) Fountain, J. S., Reith, D. M., & Holt, A. (2014). The utilization of poisons information resources in Australasia. *International Journal of Medical Informatics*, 83(2), 106–112. <https://doi.org/10.1016/j.ijmedinf.2013.10.012>
- 3) *NATIONAL POISONS INFORMATION CENTRE NATIONAL HOSPITAL OF SRI LANKA*. (n.d.).

# Feasibility Assessment of Revised Diagnosis Card to meet current issues relating to Patient Follow up

*Wijemanne W M U S, Wickremasinghe S C*

## Abstract

**Introduction:** Present **Diagnosis card (D/card)/H-383A** is the discharge summary, issued to an in-patient at the termination of stay in hospital. A fully informative D/card enhances safe care transition among healthcare professionals. There is a necessity to redesign present D/card, which is minimally structured and designed sixty years ago.

**Objective:** To assess the feasibility of revised D/card, to meet the current issues relating to patient follow up in Government Hospitals.

**Methods:** Interventional study was conducted in National Hospital of Sri-Lanka (NHSL), from December/2014 to November/2015. Assessment of inclusion/omission of information in present D/card, redesigning, introduction

of redesigned D/card to NHSL and lastly feasibility of implementation was assessed.

**Results:** Based on missing/omitted vital information, the draft-model was developed. It was further developed based on the qualitative/thematic and quantitative assessments. In comparison it was noted that the percentage of information inclusion, is higher during post-intervention.

**Conclusion:** Study indicated that the redesigned D/card is feasible to implement and recommended to all Government Hospitals.

**Key words:** Discharge summary, Diagnosis card (H383A), Medical records.

## Introduction

Documentation has been given pride of place in almost all sectors especially from the point of view of the law, as mentioned by Brad Cohn, "Nothing is more devastating to an innocent physician's defence against allegations of medical malpractice than an inaccurate, illegible or skimpy record". The failure to record patient information is a significant breach of standards of care as it has an immeasurable value in continuity of care, especially during emergencies<sup>1</sup>.

Present D/card (H383A), a medical record introduced 60 years ago, is the discharge summary issued at discharge, embodying necessary information of illness, which would be greatly helpful to any physician who subsequently examines patients<sup>2</sup>. It also establishes a mode of communication between inpatients and outpatients' settings and contributes to minimize readmissions<sup>3</sup>.

Inadequate documentation in the existing D/card may occur, as there is limited space in a minimally structured form. It contains only socio-demographic data, date-of-

admission, date-of-discharge, and a single title “investigations-and- treatments” for recording information on illness. Inclusion of information is left to the discretion of Medical Officer (MO), resulting in variation of type of information recorded by each MO. It was revealed that “writing style” and “contents” differ and there is omission of relevant data, oversights with regard to history, allergy status, duration of treatment etc<sup>4</sup>. Therefore, redesigning and amending required information to present D/card is a timely need.

### **Objectives:**

To re-design and assess feasibility of redesigned D/card in lieu of present D/card to meet current issues relating to patient follow up in Government Hospitals.

### **Methods**

An interventional study was conducted in Medical/Wards (MWs) and Surgical/Wards (SWs) of NHSL. The study period was from December/2014 to November/2015.

During **pre-intervention** an assessment of inclusion and omission of information in the present D/card and redesigning D/card to meet issues identified were done. A convenient sample was selected to assess the inclusion of relevant information from two MWs and two SWs, out of the total of

13 MWs and 13 SWs. The draft format was prepared inclusive of the most vital information extracted from various sample discharge-summaries. The percentage of information included and omitted/missed was assessed and incorporated findings to the draft of the redesigning D/card. It was further developed with the support of literature reviews, consultative meetings, Key Informant Interviews (KII) and Focus Group Discussions (FGDs). Pre-testing was done in Colombo South Teaching Hospital.

The redesigned D/card (piloted version) was introduced to the selected wards for a period of one month during **intervention**. Orientation sessions were arranged for all user groups (HOs/ MOs/ Registrars/ clinicians) and instructed to use the redesigned D/card in lieu of present card. There were 2000D/cards written by the user groups during the piloting phase.

During **post-intervention**, feasibility of implementation of redesigned D/card was assessed qualitatively and quantitatively. Qualitative method was used to check whether the changes incorporated would be acceptable to all user groups (Clinicians/HOs/MOs/Registrars). Data was subjected to thematic analysis (qualitative method) and grouped under one common category/subtheme. Similar sub themes were categorized under one main theme.

---

### **Table 1: Sub-themes and Themes of Qualitative Analysis**

Sub-Theme	Theme
Agreed on certain information-included	Content
Add new information	Content
Remove certain information	Content
Change-name	Content
Alter-space	Space
Change way/style of presentation	Presentation-style
Change logical order	Logical-Order
Questions on who should/How to fill?	Instruction-guide

During post-intervention the user group experience was assessed by administering a Self-Administered-Questionnaire/SAQ (quantitative-method) to a proportionate sample from HOs/MOs/Clinicians.

The utilization pattern of each cage of redesigned D/card was also assessed quantitatively by using a convenient sample. Data collection format was created based on the content of redesigned D/card. The inclusion of information in cages was separately analyzed and pre-and post-interventions were compared.

D/card was presented to “Expert-Working-Committee”/ EWC for finalization together with the summary of comments received during qualitative and quantitative assessments in all phases of the project until the final output/revised D/card is produced.

Ethical clearance was obtained from the University of Colombo.

### Results

During pre-intervention, the missing/omitted vital information was detected.

**Table 2: Percentage of Missing/Omitted Vital Information in Present D/cards**

Vital information	Percentage omitted
Allergy-history	8%
Blood-group	65%
Principal diagnosis	0%
Co-morbidities	55%
Consultant name-&-stamp	40%
HO-name-and-signature	50%
Presenting complaint	0%
Investigations	0%
Condition at-the-time-of-discharge	80%
Discharge-plan	50%
Medications-at-Discharge	10%
Follow-up details	45%

Above information was taken as inputs for the initial draft and allocated a separate cage for each item.

Thematic-analysis shows the feasibility of implementation of piloted-version of

redesigned D/card under five themes mentioned below.

1. Content of information
2. Space for each cage
3. Logical order of the content to be relayed
4. Presentation style of items e.g. font/box pattern
5. Preparation of instruction-guide along with the card.

User group experience on redesigned D/card by using SAQ revealed that card is well-structured, organized, availability of valid information and for its user friendliness which would direct by itself to include the relevant information of patient's illness. All agreed on A4 size and the utilization pattern of cages of D/cards (piloted-version) was assessed and compared information inclusion in pre-and-post-interventions.

**Table3: Inclusion of vital-information in D/Card (Pre-and-Post-interventions)**

<b>Vital information</b>	<b>Pre-intervention-assessment (%) (n=100)</b>	<b>Post-intervention-assessment (%) (n=100)</b>
Notification	0	82%
Blood-group	36%	45%
Allergy-history	92%	100%
Principal Diagnosis	100%	100%
Comorbidities	45%	83%
Consultant's name-and-stamp	60%	75%
HO's name-and-signature	50%	95%
Presenting complaint	100%	100%
Investigations	100%	100%
Patient's condition-at-discharge	20%	68%
Discharge-plan	50%	87%
Discharge-medication	95%	100%

It was noted that the percentage of inclusion, is higher during post-intervention. All valuable information was incorporated into the piloted version of D/card with the guidance of EWC and finally developed revised model (redesigned D/card). Approval obtained from ministry officials chaired by DGHS as the revised model is a fully informative

D/summary. As suggested it was introduced to lower-level hospitals (Base-Hospitals/Divisional-Hospitals) for period of one month, where patients of all communities seek medical attention. User groups in lower levels also accepted D/card and unanimously expressed their satisfaction.

### **Discussion**

Present D/card (H 383 A), had not been revised giving rise difficulties for both

patients and physicians and were redesigned to fulfil the aforesaid requirements.



As the details are written in an unstructured card, there is a variation of information recorded. A study done in LRH revealed that the different styles of writing D/summary has led to omission of necessary data<sup>4</sup> and indicated the requirement of redesigning a well-structured well-organized D/card. Comparison with US study reveals “patients discharge condition” like in present D/card has been omitted in most of the cards<sup>5</sup>. Accordingly, the missing information identified in pre-intervention was taken as inputs for the redesigned model.

During post-intervention, information gathered through qualitative assessment was further supported by the quantitative assessment to analyze utilization pattern of cages of redesigned D/card. Inclusion of separate cages for each item invites the attention of recorder by which nothing would be missed. Health Information and Quality Authority/Ireland referred to the above information as mandatory components in the national standard discharge summary<sup>6</sup>.

Study reveals that allergy history was recorded in all, even if the information is negative whilst the percentage of inclusion of blood group is low as it was included only if it was checked. A study reveals that the quality of documentation of Bed Head Tickets in certain aspects inclusive of adequacy and accountability were poor<sup>7</sup>. However, in this study accountability was strengthened by inclusion of cages (consultants-name/seal, HOs-name/signature).

The inclusion of cage instructions in Sinhala/Tamil” enhances awareness of

illness highlighting patient centeredness/patient-engagement<sup>8</sup>. In this study with the inclusion of cages for discharge details, percentage of recording has been improved, unlike discharge summaries in Western countries<sup>9</sup>. This study is in complete agreement with a study in which it was mentioned that consideration must be paid to content, format, and timely delivery of discharge information<sup>10</sup>.

Study indicates the percentage of inclusion of the presenting complaint/medical history/examination findings/treatment/surgical procedure and investigations is almost 100% which is further supported by LRH study that reveals, discharge summary cards were written satisfactorily<sup>4</sup>. The logical sequence of the contents to be relayed, especially “instructions” should be shifted right below “medications on discharge” helps to enhance the patient adherence to treatment<sup>11</sup>. Legible and clear information inclusion especially the “follow up details” and “instructions” benefits the patient, by fostering communication between patient and physician, enhancing drug compliance, minimizing reordering unnecessary investigations, and strengthening rational use of medications<sup>12</sup>.

With the acceptance by the user groups in all levels of hospitals and by ministry officials, it had revealed that D/card is fully informative and beneficiary for both patient and physician for continuity of care/ follow up and would be feasible to implement in Government Hospitals. Titles of cages were designed in all three languages (Sinhala/Tamil/English) in order to enhance patient-centeredness

among citizens. An instruction guide was developed to guide the completion of D/card.

### Limitations

Only the inclusion of information was assessed but no time the accuracy was checked.

### Conclusions

### References

1. Gutheil, T., & Appelbaum, P. (2000). *Clinical Handbook of Psychiatry and the Law*. Baltimore: Third Edition. Baltimore, MD: Lippincott, Williams, and Wilkins; .
2. Kripalani, S., LeFevre, F., Phillip, C., Williams, M., Basaviah, P., & Baker, D. (2007). Deficits in communication and information transfer between hospital-based and primary care physicians: implications for patient safety and continuity of care. *JAMA* ,297(8), 831-41.
3. Kazmi, S. M. (2008). Quality of Electronic Discharge Summaries at Newham University Hospital: An Audit. *BJMP*, 1 (1), 30-32.
4. Senanayake, M. P., & Edward, D. (2012). Quality of the 'diagnosis card':evidence from a single unit at the Lady Ridgeway Children's Hospital. *Sri-Lanka Journal of Child Health* , 41(3), 132-133.
5. Kind, A. J., & Smith, M. A. (2008). Documentation of Mandated Discharge Summary Components in Transitions from Acute to Subacute Care. *Advances in Patient Safety: New Directions and Alternative Approaches (Vol. 2: Culture and Redesign)*.
6. HIQA. (2013). *National Standard for Patient Discharge Summary Information*. Health Information and Quality Authority.
7. Wijesekare, N. (2014). *An assessment of quality of documentation in medical records by medical officers in a district of Sri-Lanka and effectiveness of an educational intervention to improve the quality of documentation*. Colombo.
8. Spath, P. (2008). Improving Patient Safety. In P. Spath, *Introduction to Health Care Quality management* (p. pp196). Chicago: Health Administration Press.
9. Walraven, C. (1995). Quality of A Discharge Summary System. *Canadian Medical Association Journal*, 152(9):1437-42 .
10. Kriplani, S., Jaccson, A. T., Schnipper, J., & Coleman, E. (2007). Promoting effective transition of care at hospital discharge: A review of key issues for hospitalists. *Journal of Hospital Medicine, Volume 2, Issue 5*, 314-323.
11. Martin, L., Williams, S., Haskard, K., & DiMatteo, M. (2005). The challenge of patient adherence. *ncbi*, 1(3): 189–199.
12. Walraven, C., Seth, R., Austin, P., & Laupacis, A. (2002). Effect of Discharge Summary Availability During Post-discharge Visits on Hospital Readmission. *Journal of General Internal Medicine*, pp 1525-1497.

Study indicated that the redesigned D/card is feasible to implement in different levels of hospitals and recommended to all the Government Hospitals. Currently this redesigned D/card (H383A) is in use in all Government Hospitals in Sri-Lanka.

**Medications on Discharge: (Medication / Dose / Frequency / Route / Duration)**  
 දීර්ඝ කාලීන ඖෂධ ඖෂධ (Dose) / සංඛ්‍යාව / මාර්ග / සමය (Duration)  
 ඖෂධ (Medication) / ඖෂධ (Dose) / සංඛ්‍යාව / මාර්ග / සමය (Duration)

**\*\*** ඔබගේ වෛද්‍යවරයා විසින් ඔබට ලබා දෙන ඖෂධ භාවිතයට අදාළව පිටපත් කර ඇත.  
 Please use prescribed medications as advised by the Physician.

**Discharge Plan: (Inclusive of Management plan, Advice, Diet, Life Style Behaviour)**  
 විශ්‍රාම ගතවීමේදී ඔබගේ වෛද්‍යවරයා විසින් ඔබට ලබා දෙන ඖෂධ භාවිතයට අදාළව පිටපත් කර ඇත.

Follow up Details / පිටපත් කරන විස්තර / පිටපත් කරන විස්තර

Date / දින	Day / දින	Time / වේලාව	Type of Clinic / වෛද්‍ය මධ්‍යස්ථානයේ වර්ගය	Consultant's Name / වෛද්‍යවරයාගේ නම	Room No. / කාමර අංකය

**Instructions in Sinhala or Tamil (Optional) (Eg - Disease Condition, Medication, Referrals)**  
 රෝගීන්ගේ සඳහා පිටපත් කර ඇති විස්තර (උදා: රෝග තත්වය, ඖෂධ, යොමු කිරීම්)

Referral Note / යොමු කිරීමේ සටහන / යොමු කිරීමේ සටහන

Medico-Legal / වෛද්‍ය නීතිමය	MLFF No. Date / වෛද්‍ය නීතිමය අංකය සමඟ දිනය	Name of JMO / වෛද්‍ය නීතිමය නිලධාරියාගේ නම
------------------------------	---	--

**\*\*** මෙම පිටපත් ඔබගේ වෛද්‍යවරයා විසින් ඔබට ලබා දෙන ඖෂධ භාවිතයට අදාළව පිටපත් කර ඇත.  
 Please produce this Diagnosis Card at your next consultation.



**රෝග නිවැරදි කිරීමේ පත්‍රය**  
**Diagnosis Card**

Health 383A / සෞඛ්‍ය 383A	Personal Health No. / පුද්ගලික සෞඛ්‍ය අංකය
Contact No. / සම්බන්ධතා අංකය	NIC No. / ජාතික හැඳුනුම්පත් අංකය
Blood Group / රුධිර සමූහය	Allergy (Drug/Food/Other) / ඖෂධ/භෝග/වෙනත් ඖෂධ

BHT No. / රුධිර පරීක්ෂණ අංකය	Ward/Unit / වර්ග/ඒකකය	Sex / ජාතිය	Age / වයස
Date of Admission / ඇතුළත් වූ දිනය	Date of Discharge / නික්ම ගිය දිනය		

**Principal Diagnosis / ප්‍රධාන රෝග තත්වය**  
**Comorbidities / සමරෝග තත්වය**  
**Surgeries / ප්‍රතිකර්ම**

Mode of Admission / ඇතුළත් වූ ආකාරය	Requested / Referred / මගී / යොමු කිරීම	Transferred In / මගී / යොමු කිරීම
Self / ස්වයං	By Whom / මගී / යොමු කිරීම	Transferred In / මගී / යොමු කිරීම

Discharge Notification / නික්ම යාමේ දැනුම් දීම	Yes / ඔව්	No / නැත
Medical Certificate Issued / වෛද්‍ය සහතිකයක් නිකුත් කළේ ද	Yes / ඔව්	No / නැත

Transferred Out / මගී / යොමු කිරීම	Self Discharge / ස්වයං නික්ම යාම
Transferred In / මගී / යොමු කිරීම	Self Discharge / ස්වයං නික්ම යාම

**Presenting Complaint, History, Examination Findings,  
Treatment / Surgical Procedures**

මෙහි පිළිබඳව වඩා දිගුකාලීන සාකච්ඡා සමඟින් වෛද්‍ය සංගමයේ ප්‍රධාන වෛද්‍යවරයා විසින් සාකච්ඡා කෙරුණු අවස්ථාවන්හිදී, පරිබාහිර වෛද්‍යවරයන්ගේ / වෛද්‍යවරයන්ගේ / වෛද්‍යවරයන්ගේ සහයෝගය සඳහා සඳහන් කර ඇත.

Blank area for text entry.

page 2

**Investigations**

විකල්ප වර්ග  
පරීක්ෂණ ක්‍රම

Blank area for text entry.

**Special Investigations: (Eg.- Histology Report, CT Scan)**

විශේෂ විකල්ප වර්ග (උදා- සමාන විද්‍යා වර්ග / පිටි ස්කෑන්)  
විශේෂ පරීක්ෂණ ක්‍රම (උදා- සමාන වර්ග : ස්වභාවික, CT ස්කෑන්)

Blank area for text entry.

**Patient's Condition at the Time of Discharge**

මුදාහරින අවස්ථාවේ රෝගියාගේ තත්වය  
බාහිරවෛද්‍යවරයා විසින් සඳහන් කළ යුතුය.

page:

# Novel digital adherence technologies for the tuberculosis treatment

Ranawaka N, Nandasena S, De Alwis S

Tuberculosis (TB) is a communicable disease responsible for millions of deaths and morbidity worldwide (1). Proper adherence to TB treatment can minimize morbidity, mortality, and drug resistance (2). Directly observed treatment, short-course (DOTS) strategy was initiated by WHO's Global Tuberculosis Programme in 1993 to improve adherence to TB treatment. Patients need to attend physically to healthcare centers or DOTS centers for direct observation of treatment by the healthcare worker. Though adherence improved with traditional DOTS, daily attending to DOTS centers is not practical in the modern world and is associated with high out-of-pocket expenditure (OOPE) (3). This article focused on the novel digital adherence technologies for TB treatment that can be used as an alternative to traditional physical DOTS.

National Programme for Tuberculosis Control and Chest Disease (NPTCCD) is the central level organization responsible for TB control in Sri Lanka. There is a District Chest Clinic (DCC) in each district to operate TB control activities (4). NPTCCD and the Regional Directorate of Health Services (RDHS) monitor each DCC. NPTCCD and RDHSs are mainly managed by medical administrators. As adherence to TB treatment is key to achieve all TB related targets (End TB Strategy, Sustainable Development Goals), medical administrators should be aware of the novel digital adherence technologies for TB treatment.

The literature review was done through manual reference, searching electronic databases (e.g., PubMed, Cochrane library, Google scholar and HINARI gateway) and general internet tools (such as the Google search engine). The keywords used for the electronic databases were "Digital adherence technologies" "Video Directly Observed Treatment" "noncompliance", "TB treatment", "DOTS".

With the technological advancement and increased coverage of cellular phones, signals, and the internet, many inventors were able to design many ways to improve drug compliance, reduce the disadvantages of traditional DOTS, and reduce OOPE by using new technology. Short messageservice (SMS)-based strategies, voice call, 99DOTS therapy, Video DOT (VDOT), Digital pillboxes, and Ingestible sensors are some of the interventions researchers experimented with different success rates (5). All these advanced methods are called "Digital Adherence Technologies" (DAT).

According to the main function, DAT can be divided into three main categories, 1) reminder function 2) observation of drug intake by digital technique, and 3) compilation of dosing histories (5).

## 1) Reminder function

It addresses some barriers for drug compliance, such as forgetfulness, psychosocial and structural barriers (multiple jobs, busy working schedule). It

promotes pill-taking behaviour (e.g., Daily SMS reminder, voice call reminder, digital pillboxes).

2) Observation of drug intake by digital technique

This is the technology-based modification of DOTS. Healthcare workers observe drug intake by patients virtually or electronically record methods (e.g., Video DOTS, Ingestible sensors).

3) Compilation of dosing histories

Dosing histories can be collected by real-time such as sending automated SMS while opening of the pill box, or clinic visit-based adherence monitoring, such as access history by web-based interface.

An SMS-based daily reminder is the most affordable and reachable way to increase drug adherence and compliance. Most of the patients, even in underdeveloped countries, have their own or family-owned basic phones. Randomized control trials revealed that SMS-based daily reminders increase drug compliance (6), (7).

Phone-based interactive or non-interactive/pre-recorded voice call is another way to remind the drug intake and improve drug compliance. The voice call can be taken by software, bulk voice call services or by a facilitator. Software based voice call project called “Call for life – TB” in Uganda, as well as in Ethiopia, disclosed the high compliance rate by daily pre-recorded voice call to TB patients (8)(9).

A digital pillbox is a box used to store drugs that can record the opening and closing of the box, which indicate drug intake by the proxy way. Digital boxes can be designed to

remind the drug intake by alarm, warning lights, or automated voice message. Digital pillbox has also shown increased drug compliance (10)(5).

Video-DOTS (VDOTS) allows patients to send recorded videos of drug intake through the internet to ensure drug compliance. It may be synchronized or not. The health care provider can monitor drug intake live or later. There is many software available to facilitate VDOT. This method is the most successful method over other DATs. Many research revealed the highest adherence rate to VDOTS (5), (11).

Ingestible sensors are comparatively expensive and high-end technology that can detect actual drug ingestion. Microchip imprinted with unique barcodes embedded with TB tablets. When the patient ingested the tablets, the embedded sensor separated from the tablets and could detect the time and date of tablet intake by a barcode reader. This is also proven to increase drug compliance (5).

“99DOTS” is a relatively cheap method developed by researchers at “Ever well Health Solutions”. In this method, TB drugs are wrapped in a special envelope that contains unique numbers. When breaking the envelope patient can reveal a toll-free phone number. Patients have been advised to leave a missed call to that number. The missed calls are recorded in a computer server. “99DOTS” also revealed increased adherence to TB medication (5).

DATs may open door to a new era of TB management, which will lead to achieve the end TB strategy in future.

## References

1. WHO. Global Tuberculosis Report 2021 [Internet]. 2021. Available from: <https://www.who.int/publications/i/item/9789240037021>
2. Tola HH, Tol A, Shojaeizadeh D, Garmaroudi G. Tuberculosis Treatment Non-Adherence and Lost to Follow Up among TB Patients with or without HIV in Developing Countries: A Systematic Review. *Iran J Public Health* [Internet]. 2015;44(1):1–11. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26060770><http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=PMC4449995>
3. Ranawaka N, Nandasena S, De Alwis S. Direct out-of-pocket expenditure of tuberculosis treatment in intensive phase in Kalutara District, Sri Lanka. *Indian J Tuberc* [Internet]. 2022;(123). Available from: <https://doi.org/10.1016/j.ijtb.2022.06.003>
4. NPTCCD. National Manual for Tuberculosis Control [Internet]. 2016. 1–192 p. Available from: [http://www.nptccd.health.gov.lk/uploaded/documents/NPTCCD National TB Control Manual to Print.pdf](http://www.nptccd.health.gov.lk/uploaded/documents/NPTCCD%20National%20TB%20Control%20Manual%20to%20Print.pdf)
5. Subbaraman R, de Mondesert L, Musiimenta A, Pai M, Mayer KH, Thomas BE, et al. Digital adherence technologies for the management of tuberculosis therapy: mapping the landscape and research priorities. *BMJ Glob Heal*. 2018;3(5):e001018.
6. Lester R, Park JJ, Bolten LM, Enjetti A, Johnston JC, Schwartzman K, et al. Mobile phone short message service for adherence support and care of patients with tuberculosis infection: Evidence and opportunity. *J Clin Tuberc Other Mycobact Dis* [Internet]. 2019;16:100108. Available from: <https://doi.org/10.1016/j.jctube.2019.100108>
7. Nglazi MD, Bekker LG, Wood R, Hussey GD, Wiysonge CS. Mobile phone text messaging for promoting adherence to anti-tuberculosis treatment: A systematic review. *BMC Infect Dis*. 2013;13(1):1–16.
8. Gashu KD, Gelaye KA, Lester R, Tilahun B. Effect of a phone reminder system on patient-centered tuberculosis treatment adherence among adults in northwest ethiopia: A randomised controlled trial. *BMJ Heal Care Informatics*. 2021;28(1).
9. Byonanebye DM, Mackline H, Sekaggya-Wiltshire C, Kiragga AN, Lamorde M, Oseku E, et al. Impact of a mobile phone-based interactive voice response software on tuberculosis treatment outcomes in Uganda (CFL-TB): a protocol for a randomized controlled trial. *Trials*. 2021;22(1):1–13.
10. Manyazewal T, Woldeamanuel Y, Holland DP, Fekadu A, Blumberg HM, Marconi VC. Electronic pillbox-enabled self-administered therapy versus standard directly observed therapy for tuberculosis medication adherence and treatment outcomes in Ethiopia (SELFTB): Protocol for a multicenter randomized controlled trial. *Trials*. 2020;21(1):1–13.
11. Holzman SB, Atre S, Sahasrabudhe T, Ambike S, Jagtap D, Sayyad Y, et al. Use of smartphone-based video directly observed therapy (vDOT) in tuberculosis care: single-arm,prospective feasibility study. *JMIR Form Res*. 2019;3(3):1–12.

# Selected factors linked with treatment compliance among patients attending mental health clinic in National Hospital Kandy Sri Lanka

Singhaprathapa SWMKK

## Abstract

**Introduction:** Non-compliance to treatment has been identified as a major factor in therapeutic failure in routine practices and scientific therapeutic trials and is directly related to poor prognosis. Furthermore, poor compliance to treatment leads to frequent relapses and repeated admissions and re-admissions to mental health units of hospitals and subsequently leads to poor quality of life for both patients and family members.

**Objective:** To determine factors linked with treatment compliance among mentally ill patients in National Hospital Kandy (NHK).

**Methods:** Hospital-based cross-sectional descriptive study was conducted at NHK using a systematic sampling technique. The study instruments used were an interviewer-administered questionnaire for patients, In-depth interviews for Consultant Psychiatrists and a Checklist for service availability. The sample size was 427 with inclusion criteria; diagnosed psychiatric patients with capability of responding, attended clinic for one year and aged more than 18y. Patients with high-risk behaviour were excluded. Study was conducted from October 2018 to September 2019.

**Results:** The vast majority of participants were Sinhalese (n=367, 85.9%), Buddhist (76.3%) and females (55.3%). The mean age was 50.2 years. Two groups studied were those compliant with treatment (n=307; 71.9%) and noncompliant with

treatment (n=120; 28.1%). Selected factors that were statistically significant at P value <0.05 were determined as linked with treatment compliance.

**Conclusions:** Determined factors linked with treatment non-compliance were living alone, poor family support, lack of insight, increased waiting time at pharmacy and clinic, social stigma, and lack of social support. Recommend outreach programs to identify patients living alone and poor family support along with developing support networks and telehealth options, educational programs to improve patients' insight, a separate counter at pharmacy for psychiatric clinic to minimize waiting time at pharmacy, an appointment system to reduce waiting time at clinic, and strengthen multi-sectoral collaboration to reduce social stigma through media and community programmes by social workers.

**Keywords:** Factors, treatment compliance, mental health, non-compliance

## Introduction

Health is a state of physical, mental, or psychological, social and spiritual well-being and not merely the absence of disease or infirmity. In other words, it is the ability to lead a socially and economically productive life [1]. Mental health is a state of well-being in which every individual realizes his or her own potential, can cope up with the normal stresses of life, can work productively and fruitfully and can make a contribution to



his or her community [2]. 450 million people are suffering from mental illnesses in the world [1] constituting 13% of the global burden of diseases. Also, one million people commit suicide annually and suicide is the fourth of six leading causes of Years Lost due to Disability (YLD) and one in four families have at least one person suffering from a mental illness in the world [3]. When the situation in Sri Lanka is considered, 3000 people commit suicide annually and where the suicide rate is considered, Sri Lanka ranks eighth in the world. Moreover, 40,000 patients are being admitted to mental health units in government hospitals in Sri Lanka annually. Mental health accounts for 11.5% of the disease burden in Sri Lanka [4]. The diminished capacity to grant consent and the diminished ability to answer questions by mentally ill patients are the most challenging factors in mental health-related researches [5]. It is suggested that these bottlenecks could be overcome by practicing a proper recruitment plan for respondents, proper screening methods and collaborating with the experts in consent capacity assessment [5]. Fulford and Howse (1993) declared that being mentally ill is not synonymous with incompetence in making decisions and they also have the right to attend or not to attend in researches like other people. The study has concluded that the average score of the mentally ill was better than most people in the normal population in giving informed consent for the research and the performance of the mentally ill people was the same as most of the non-mentally ill people.

Treatment compliance is not only the degree to which a patient carries out the clinical recommendations of a physician

but also, adherence to medical device use, self-care, self-directed exercise, and therapy sessions. The non-compliance is the failure of the patients to carry out the clinical recommendations of physicians and adherence to the above [6]. The non-compliance is observed among all age groups from children to the elderly and it is a notable feature in most of the non-communicable diseases including mental illnesses [7]. Non-compliance to treatment leads to relapses, admissions, and readmissions to mental health units [8]. The non-compliance has been identified as a major factor in therapeutic failure in routine practices as well as scientific therapeutic trials and it has been directly related to poor prognosis [9]. Therefore, treatment compliance is very important in mental health.

Three thousand two hundred (3200) patients have been registered and followed up in the mental health clinic in NHK and out of them, 2400 patients have discontinued treatment at least more than one month from August 2017 to August 2018 and the percentage was 75% [13].

**General objective:** To determine selected factors linked with treatment compliance among patients attending the mental health clinic in National Hospital Kandy Sri Lanka

**Specific objectives:**

1. To describe the socio-demographic and economic characteristics of patients attending the mental health clinic in National Hospital Kandy
2. To determine patient-related factors linked with treatment compliance among patients attending the mental health clinic in National Hospital Kandy

3. To determine health service-related factors linked with treatment compliance among patients attending the mental health clinic in National Hospital Kandy

## **Methodology**

### **Study Design**

A hospital-based cross-sectional descriptive study was carried out at National Hospital Kandy

### **Study Setting**

This study was conducted at the mental health clinic in NHK

### **Study Population**

All patients who have been diagnosed as having a mental illness attending the mental health clinic in NHK.

### **Steps in Research**

There were three steps in this research.

Step I-Interviewer Administered Questionnaire for Selected Factors Linked with Treatment Compliance (IAQSFLTC) for patients.

Step II- In-depth Interview (IDI) for Consultant Psychiatrists

Step III-Checklist for service availability (CLSA)

### **Sample Size**

The sample size was calculated by using the following formula [14] considering a non-response rate of 10% and the final sample size was 427.

### **Sampling Technique**

Systematic sampling technique was carried out.

### **Data collection**

The IAQSFLTC was administered by the Principal Investigator (PI) with two assistants and privacy was ensured by conducting the interviews in a separate

room. The PI was available all the time in the study setting for the clarification of the questionnaire and other related matters regarding the research. The data collection of the two assistants was observed by the PI who ensured the collection of data following the correct methodology.

The selected participants were requested first to go to the PI. The capability and suitability assessment were conducted and informed written consent was obtained by the PI. The respondents were randomly allocated to the two interviewers for the interviews.

In-depth Interview with Consultant Psychiatrists and the filling of the Checklist was carried out by the PI. The in-depth interview with consultant psychiatrists has been recorded using a digital audio device after explaining and obtaining the consent and the duration of the interview was approximately twenty to thirty minutes.

### **Ethical considerations**

Although mentally ill patients fall into vulnerable groups, every possible effort was taken by the PI to avoid any vulnerability by maintaining International Ethical Guidelines [15] and the Declaration of Helsinki, World Medical Association [16].

### **Conflict of interests**

There was no conflict of interest.

### **Results**

It was observed that 307(71.9%) were “compliant to treatment” and 120 (28.1%) were “non-compliant to treatment.”

**Table 1: Distribution of Disease Condition among Participants according to Level of Compliance to Treatment**

Disease Condition	Level of Compliance with Treatment		Total (%)
	Compliant Patients(%)	Noncompliant patients (%)	
Schizophrenia	54(67.5%)	26(32.5%)	80(100.0%)
Dementia	9(75.0%)	3(25.0%)	12(100.0%)
Depression	91(64.5%)	50(35.5%)	141(100.0%)
Bipolar affective disorder(BPAD)	40(62.5%)	24(37.5%)	64(100.0%)
Anxiety disorder	14(93.3%)	1(6.7%)	15(100.0%)
Substance-related disorder	13(61.9%)	8(38.1%)	21(100.0%)
Post-partum psychosis	16(76.2%)	5(23.8%)	21(100.0%)
Personality disorder	20(95.2%)	1(4.8%)	21(100.0%)
Delusional disorder	26(96.3%)	1(3.7%)	27(100.0%)
Obsessive-compulsive disorder	18(100.0%)	0(0.0%)	18(100.0%)
Schizo affective disorder	4(100.0%)	0(0.0%)	4(100.0%)
Other	2(66.7%)	1(33.3%)	3(100.0%)
Total	307(71.9%)	120(28.1%)	427(100.0%)

Table 1 displays that the majority of respondents had Depression (n=141, 33%) and fifty of them (35.5%) were non-compliant. Next to it were Schizophrenic patients (n=80, 18%) and out of 80, 26(32.5%) were non-compliant. Moreover, 37.5% of BPAD were non-compliant (n=24). In-depth interviews with Consultant Psychiatrists also confirmed this finding.

**Table 2: Patient-Related Factors According to Level of Compliance to Treatment**

Variable	Level of Compliance with Treatment		Total	Significance
	Compliant Patients(%)	Non-compliant Patients(%)		
<b>Patient's Insight</b>				<b>X<sup>2</sup> (d.f.=1) = 6.996 P=0.008</b>
Yes	78(62.9%)	46(37.1%)	124(100.0%)	
No	229(75.6%)	74(24.4%)	303(100.0%)	
Total	307(71.9%)	120(28.1%)	427(100.0%)	
<b>Living Status</b>				<b>X<sup>2</sup> (d.f.=1) =15.320 P=0.0001 (Rows 2,3 amalgamated)</b>
With Family	283(74.1%)	99(25.9%)	382(100.0%)	
With Relative	14(73.7%)	5(26.3%)	19(100.0%)	
Alone	10(62.9%)	16(62.9%)	26(100.0%)	
Total	307(71.9%)	120(28.1%)	427(100.0%)	
<b>Family Support</b>				<b>X<sup>2</sup> (d.f.=1) =33.7 P&lt;0.0001</b>
Available	280(85.0%)	48(15.0%)	328(100.0%)	
Not available	22(33.3%)	44(66.6%)	66(100.0%)	
Total	302(76.0%)	92(24.0%)	394(100.0%)	
<b>28 from non-compliant and 5 from compliant had not responded to this question</b>				

Table 2 demonstrates that poor family support, living alone, and lack of patient's insight contributes to treatment non-compliance among patients attending mental health clinic at

NHK. The study aimed to uncover the statistically significant relationships between these factors and non-compliance. Patients with poor family support systems were notably more prone to not following their prescribed treatment. The statistical analysis emphasized that living alone can have a detrimental impact on treatment adherence. Patients who lacked insight were more likely to deviate from their prescribed regimens.

**Table 3: Service-Related Factors According to Level of Compliance to Treatment**

Variable	Level of Compliance with Treatment		Total	Significance
	Compliant	Noncompliant		
<b>Waiting Time at Clinic</b>				
Less than 1/2h	10(40.0%)	15(60.0%)	25(100.0%)	$X^2_{(d.f.=1)}= 33.47$ $p<0.0001$ (Rows 1,2,3 and 4,5 amalgamated)
1/2 to 1h	11(37.9%)	18(62.1%)	29(100.0%)	
1 to 2h	20(74.1%)	7(25.9%)	27(100.0%)	
2 to 3h	245(76.8%)	74(23.2%)	319(100.0%)	
More than 3h	21(77.8%)	6(22.2%)	27(100.0%)	
Total	307(71.9%)	120(28.1%)	427(100.0%)	
<b>Waiting Time at Pharmacy</b>				
Less than 1/2h	7(33.30%)	14(66.7%)	21(100.0%)	$X^2_{(d.f.=1)}=30.260$ $p<0.0001$ (Rows 1,2,3 and 4,5, amalgamated)
1/2 to 1h	11(42.30%)	15(57.7%)	26(100.0%)	
1 to 2h	26(72.2%)	10(27.8%)	36(100.0%)	
2 to 3h	247(76.5%)	76(23.5%)	323(100.0%)	
More than 3h	16(76.2%)	5(23.8%)	21(100.0%)	
Total	307(71.9%)	120(28.1%)	427(100.0%)	
<b>Social workers' support</b>				
Available	214(89.9%)	24(9.1%)	238(100.0%)	$X^2_{(d.f.=2)}=146$ $P<0.0001$
Not available	23(25.8%)	66(74.2%)	89(100.0%)	
Not responded	64(64.0%)	36(36.0%)	100(100.0%)	
Total	307(71.9%)	120(28.1%)	427(100.0%)	

Table 3 shows that out of 427 sample, 344(80%) had waited more than 2 hours at the pharmacy to collect drugs. And out of 120 non-compliant 81(67%) had waited more than 2 hours. IDI with Consultant Psychiatrists revealed that the reason for the high waiting time at the pharmacy was the unavailability of a separate counter for mental health clinic patients. Furthermore, Table demonstrates that 238(56.0%) participants had social workers' support while 89 (20.0%) had no support. There was a statistically significant association with social workers' support between the two groups ( $X^2=146$ ,  $P<0.0001$ ). The study showed a statistically significant association between long waiting times at clinics and pharmacies and non-compliance. Patients who waited for 2 – 3 hours exhibited a significantly higher likelihood of compliance. A lack of support from social workers appeared as another statistically significant contributor to non-compliance.

**Table 4: Social Stigma Association according to Level of Compliance to Treatment**

Social Stigma	Level of Compliance with Treatment		Total	Significance
	Compliant Patients	Non-compliant Patients		
Believed	285(87.7%)	40(12.3%)	325(100%)	$X^2_{(d.f.=1)} = 48.47$ $P < 0.001$
Not Believed	22(21.6%)	80(78.4%)	102(100%)	
Total	307(71.9%)	120(28.1%)	427(100%)	

Table 4 indicates that 325 participants (76%) believed psychiatric illnesses carry a social stigma. Furthermore, the compliant patients (87.7%) believed in social stigma more than the non-compliant. The social stigma was statistically significant ( $X^2=48.47$ ;  $P=0.001$ ) between compliant and non-compliant.

**Table 5: Effect of Social Stigma on Patient Preference for Distant Healthcare Facilities Regardless of Travel Distance**

Distances from House to Hospital	Social Stigma		Total	Significance
	Believed	Not Believed		
1 to 5km [short distance]	40(72.0%)	15(18.0%)	55(100.0%)	$X^2_{(d.f.=1)}=9.828$ $P=0.001$ <i>(Rows 1,2 amalgamated)</i>
6 to 10km [short distance]	25(78.0%)	07(22.0%)	32(100.0%)	
More than 10km [long distance]	260(76.0%)	80(24.0%)	340(100.0%)	
Total	325(76.0%)	102(24.0%)	427(100.0%)	

Table 5 shows that the majority of patients who come from a long distance ( $n=260,80.0\%$ ) believed in social stigma than those who come short distance ( $n=65,20.0\%$ ). There was a statistically significant association between social stigma with travelling distance in two groups ( $X^2 = 9.828$ ,  $P < 0.001$ ). It was revealed that a significant number of patients who experienced social stigma linked with their mental illnesses preferred to travel greater distances to access treatment. This preference for distant healthcare facilities might be due to avoiding encountering familiar faces, potential acquaintances, or individuals who are aware of their mental illnesses. The fear of being judged, misunderstood, or labelled due to their mental illnesses often compelled these patients to seek anonymity and privacy in healthcare. Furthermore, statistical analyses confirmed

the robustness of this relationship. The correlation between social stigma and the distance patients were willing to travel for treatment was found to be statistically significant. This underlines the powerful role that stigma plays in shaping patients' decisions, even to the extent of overcoming practical considerations such as travel time, convenience, and geographical proximity.

### Discussion

The sample was divided as “compliant to treatment” and “non-compliant to treatment” based on selected criteria. Out of 427 samples, 307(71.9%) were “compliant and 120 (28.1%) were “non-compliant”.

When considering the socio-demographic characteristics, the vast majority of participants were Sinhalese (85.9%),

Buddhist (76.3%) and this is comparable with the population statistics available at District Secretariat Kandy [19]. The majority of the participants were females (55.3%). The female participants were more predominant although male participants were more vulnerable to mental illnesses than females [20].

The preponderance of participants was unemployed (89%) as illness causes disability [2]. The majority of participants were on treatment for more than 5 years (70%) because of the nature of chronic illness.

The commonest illnesses with non-compliance to treatment were Bipolar Affective Disorder (37.5%) Depressive disorder (35.5%) and Schizophrenia (32.5%). These findings were comparable with a study carried out in Pakistan Institute of Medical Sciences, Islamabad [10]. Furthermore, a study carried out in Sri Lanka previously in Provincial General Hospital Rathnapura in 2015[11,12] showed similar findings. These features were also comparable with Consultant Psychiatrists' opinions.

It has been revealed that the majority of the participants did not have insight into their illnesses (n=303, 71%). There was a statistically significant association with insights between two groups (P=0.008). Moreover, Rao et al in 2017 showed similar results in their study[20].

There was a statistically significant association with distances from house to clinic between the two groups. PI further analyzed the level of compliance with social stigma status and cross-tabulation done with distance from house to clinic. It was revealed that a significant number of patients who experienced social stigma

linked with their mental illnesses preferred to travel greater distances to access treatment. This preference for distant healthcare facilities might be due to avoiding encountering familiar faces, potential acquaintances, or individuals who are aware of their mental illnesses. The fear of being judged, misunderstood, or labelled due to their mental illnesses often compelled these patients to seek anonymity and privacy in healthcare.

IDI with consultant Psychiatrists revealed that respondents' average waiting time at the clinic was 2 to 3 hours. However, there was no apparent influence on compliance with the waiting time at the clinic. It might be due to observation inaccuracy or due to the effect of a confounder.

Consultant Psychiatrists emphasized that social stigma, poor family support, living alone, poor insight, prolonged waiting time at the clinic, pharmacy and laboratory, unavailability of drugs, side effects of drugs, unaffordability of drugs and unavailability of a separate counter at the pharmacy for mental health clinic were linked with treatment compliance among patients attending mental health clinic NHK.

### **Limitations**

1. The study was done at mental health clinic in NHK and was unable to include inward patients as well as those who never come to clinic. Therefore, generalization of results to National level is not possible.
2. IDI was conducted only with two Consultant Psychiatrists while representation of many other key informants was limited. Hence, their

contribution to intended objectives was also limited.

3. Most of the patients had more than two hours of waiting time at pharmacy that had not been influenced on compliance. However, data might be inaccurate owing to perception error as waiting time was not calculated at pharmacy.

### Conclusions

Study was conducted to determine factors linked with treatment compliance among patients attending mental health clinic in NHK.

1. Non-compliance to treatment was more common among patients with Depression, Schizophrenia and BPAD.
2. Socio-demographic characteristics significantly linked with treatment compliance were living alone, poor family support and distance to the clinic.
3. Patient-related factors significantly linked with treatment compliance were poor insight and social stigma. Moreover, a significant number of patients who experienced social stigma linked with their mental illnesses preferred to travel greater distances to access treatment.
4. Health service-related factors significantly linked with treatment compliance were waiting time at the

clinic and pharmacy and lack of social workers' support.

### Recommendations

1. More attention should be paid to patients with Depression, Schizophrenia and BPAD as noncompliance was more common among them.
2. There should be a separate counter at the pharmacy for mental health clinic patients and that would minimize waiting time at the pharmacy.
3. There should be an appointment system at the clinic and that would reduce waiting time at clinic.
4. Recommend outreach programs to identify patients living alone and poor family support along with developing support networks and telehealth options.
5. Recommend educational programs to improve patients' insight.
6. Strengthen the multi-sectoral collaboration to reduce social stigma through media and community programmes by social workers.
7. Further studies are needed to explore factors linked with compliance and for the generalizability of data.

### References

1. World Health Organization, (2016). WHO Mental Health Action Plan. Available at <http://www.who.int/mental health>.
2. World Health Organization, (2013). WHO Mental Health Action Plan 2013-2020. PRESS Geneva, Switzerland.
3. World Health Organization, (2013). Zero draft 2013-2020 Global mental health action plan.

4. Ministry of Health, (2016). Directorate of mental health (pp.192). In Annual Health Bulletin: Medical Statistics Unit, Sri Lanka.
5. Gupta, U.C., Kharawala. (2012).Perspective of Clinical Research on compliance; Indian Journal of Psychiatry, Vol: 55(1).
6. Kaplan, H.I., Sadock, B.J.(1998). Synopsis of psychiatry. 8th Ed. New Delhi: BI Waverly.
7. Lacombe, P.A., Vicente, J.A.G., Pages, J.C., Morselli, P.L.(1996). Causes and problems of non-response or poor response to drugs; 51:552-70.
8. Morris, L.S., Schulz, R.M. (1992). Patient compliance - an overview Clin Pharm; 17:283-95.
9. Billups, S.J., Malone, D.C., Carter, B.L. (2000). Relationship between drug therapy non-compliance and patient characteristics, health-related quality of life and health care costs. Pharmacotherapy; 20:941-9.
10. Khan, S.,Taj, R.(2005).*A study of reasons of non-compliance to psychiatric treatment.*
11. Rodrigo, P.C., Jayananda, G. (2016).A study on high default rates in treatment for Depression in rural Sri Lanka.
12. Mendis,J.,Jenkins,R.,Cooray,S.,&Cooray,M.,(2012)Integration of mental health into primary care in Sri Lanka.Mental Health in Family Medicine,9(1),15-24.
13. Annual Report on Mental Health, National Hospital Kandy, 2018.
14. Lwanga, S.K., Lameshaw, S. (1991). Sample size determination in health studies, ‘A practical manual’ Geneva, WHO.
15. International Ethical Guidelines for Health-related Research Involving Humans” prepared by the Council for International Organizations of Medical Sciences (CIOMS) in collaboration with the World Health Organization (WHO) (page 57 & sections15, 16, 17)
16. WMA Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects. (Last cited on 26th February 2016).
17. Abdulbari, B., Iram, T.K., Suhaila, G., Hanan,M.(2016).A study on treatment non-compliance of psychiatric patients and linked factors. British Journal of Medicine & Medical Research 4(2):785-796.
18. General Circular numbered 01-29/2018, Ministry of Health, Nutrition & Indigenous Medicine, Sri Lanka.
19. Population statistics available at District Secretariat Kandy,(2016).
20. Rao, K. N., George, J., Sudarshan, C. Y., & Begum, S. (2017). Treatment compliance and noncompliance in psychoses. Indian Journal of Psychiatry, 59(1), 69-76. [https://doi.org/10.4103/psychiatry.IndianJPsychiatry\\_24\\_17](https://doi.org/10.4103/psychiatry.IndianJPsychiatry_24_17)
21. Steel Z, Marnane C, Iranpour C, Chey T, Jackson JW, Patel V, Silove D. The global prevalence of common mental disorders: a systematic review and meta-analysis 1980-2013. Int J Epidemiol. 2014 Apr;43(2):476-93. doi: 10.1093/ije/dyu038. Epub 2014 Mar 19. PMID: 24648481; PMCID: PMC3997379.



# Development of an Area Specific Monthly Dengue Case Target Calculator for Dengue Control in Sri Lanka

Wijetunga WMTS, Kodituwakku KALC, Francis GS.

---

## Abstract

**Background:** The National Dengue Control Unit (NDCU) aims to reduce the incidence of dengue below 100 per 100,000 populations by the end of 2023. Yet, recurrent outbreaks stress the need for increased local-level actions to meet these goals.

**Objective:** This study aims to create an area specific monthly calculator for dengue case targets in districts and Medical Officer of Health (MOH) areas, accounting for seasonal changes, historical trends, and the National target.

**Methodology:** The best available indicator for determining monthly dengue case targets is the seasonal index (SI). The monthly SI was computed for each district and MOH area based on data from 2012 to 2019 using Minitab 2020 software. However, extreme outlier cases in 2017 and 2019 were removed to enhance forecasting accuracy, resulting in a lower Mean Absolute Percentage Error (MAPE).

Moreover, the annual average dengue caseload for each district and MOH area was computed from 2015 to 2019, relying on past trends. Subsequently, a spreadsheet-based calculator was designed, incorporating various formulae to determine district and MOH area monthly targets. These targets align with seasonal patterns, historical trends, and national objectives, accompanied by graphs for visualizing and comparing

reported cases against the set monthly targets.

**Results:** Annual and monthly targets were set for all districts and MOH areas automatically based on targeted annual incidence of dengue in the country. Monitoring and comparing the actual burden of dengue patients in each district and MOH area with the set targets, can identify considerable upward deviations. Hence, warranted many control actions at different levels.

**Conclusion and Recommendations:** This calculator can be used to enumerate the deviation of each district and MOH area from the national target thus enabling effective outbreak control and achieving targets.

**Key words:** Dengue seasonal index, Dengue Target calculator, Dengue historical trends

## 1. Introduction

### 1.1 Background and Rationale

Dengue outbreaks in Sri Lanka exhibit distinct seasonal patterns related to the country's two monsoons, alongside recurring surges in intensity every two to three years [1]. Despite the elevated occurrence of dengue cases in Sri Lanka, the Case Fatality Rates (CFR) remain relatively low. The outcome objectives of the National Action Plan on Prevention and Control of Dengue

in Sri Lanka for 2019-2023 are as follows [2].

1. To achieve an annual case incidence of Dengue below 100 per 100,000

population in Sri Lanka by the end of 2023 (Table 1).

2. To reduce and maintain the annual CFR below 0.1% in Sri Lanka by the end of 2023 (Table 2).

**Table 1: Statistics related to Outcome Objective 1 of the National Action Plan on Prevention and Control of Dengue in Sri Lanka**

Year	Reported Patients	Annual Incidence [Per 100,000 Population]
2017	186,101	886
2019	105,049	500
2020	31,162	148
2021	35,924	167

**Table 2: Statistics related to Outcome Objective 2 of the National Action Plan on Prevention and Control of Dengue in Sri Lanka**

Year	Total Dengue Deaths	Annual CFR (per 100 cases)
2010	246	0.72
2017	440	0.24
2019	257	0.15
2020	36	0.12

To assess whether the National Dengue Control Unit (NDCU) has achieved its intended outcomes, it is crucial to employ evidence-based and innovative approaches to establish targets at different tiers: national, district, and Medical Officer of Health (MOH) area levels. Therefore, a predetermined target for the total number of dengue cases in 2022 was formulated (corresponding to the year of this study). Ideally, the actual incidence of dengue cases should fall below this predetermined target to fulfil the primary objective of the NDCU. From a programmatic viewpoint, if we set a yearly target of 150 dengue cases per 100,000 population for 2022 at the national

level, the maximum expected annual dengue cases in Sri Lanka would be 33,055, based on the estimated population. Consequently, implementing potential preventive and control measures to maintain the actual dengue cases in the country below this set target would alleviate the strain on the healthcare system.

Using the national target for 2022, program managers in public health need to determine corresponding targets for districts and MOH areas. These targets should extend beyond annual targets to encompass monthly targets that consider seasonal patterns, annual trends, and other

scientific and rational strategies aimed at enhancing dengue control. Therefore, the following elements should be considered while establishing program-level targets:

- a. What are the yearly targets for dengue cases in each district, based on the national objective?
- b. What are the yearly targets for dengue cases in MOH areas, considering the district targets?
- c. What are the monthly targets for both districts and their respective MOH areas, derived from the annual targets?

## 1.2 Objective

The objective of this study was to develop an area specific monthly dengue case target calculator for the districts and MOH areas taking into consideration.

- seasonal variations,
- historical trends, and
- the National Action Plan targets

## 2.0 Methodology

Key informant interviews (KII) were conducted with the NDCU's Director, along with two Consultant Community Physicians, two Medical Officers in Bioinformatics, and three senior Medical Officers. An evaluation of the DenSys database and other secondary data was undertaken to ascertain the existing options for data analysis within the NDCU.

After conducting the KIIs and engaging in discussions, the main question arose: how

should the annual national case burden objective for the country be allocated to the individual districts and MOH areas? For instance, if the aim is to achieve an incidence rate of 150 cases per 100,000 population at the national level in 2022, amounting to 33,055 patients based on the population of Sri Lanka, what would be the anticipated annual and monthly patient load targets for various districts and MOH areas across Sri Lanka?

Hence, following methods were used to develop these targets. We used historical trends to calculate annual average percentage of dengue burden of each district and MOH area.

Dengue patients of each district and MOH area of Sri Lanka which were reported on daily, monthly, and annual basis from 2015 to 2019 were obtained from the DenSys database [3]. These data were converted to following information.

- The annual average percentage burden of dengue of each district based on national cumulative total (Table 3).
- The annual average percentage burden of dengue of each MOH area based on district cumulative total (Table 4).

**Table 3: Average percentage district burden of dengue based on historical trends 2015 – 2021.**

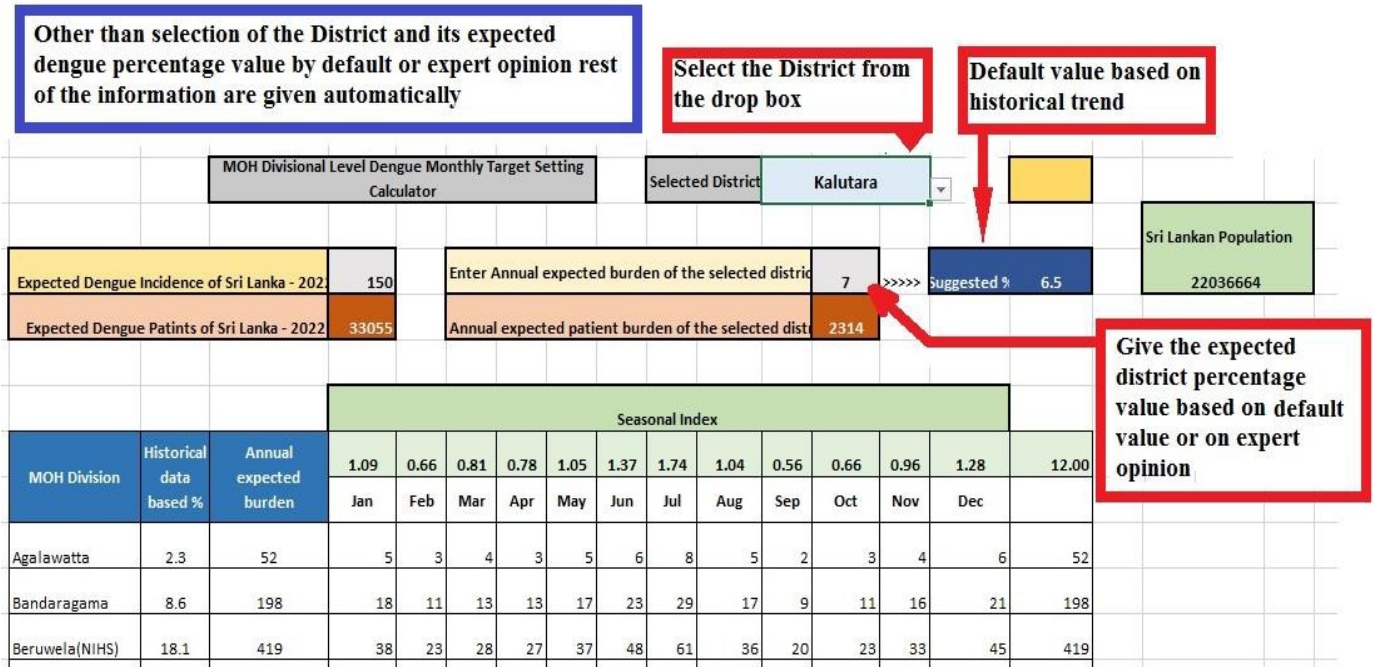
District	Historical trend as a percentage (%) to the cumulative total
Colombo	33.5
Gampaha	15.3
Kandy	7.4
Kaluthara	6.5
Ratnapura	5.2
Kurunegala	4.5
Batticaloa	3.6
Kegalle	3.6
Jaffna	3.3
Galle	2.8
Kalmunai	2.4
Matara	2.1
Puttalam	2.0
Badulla	1.3
Anuradhapura	1.1
Hambantota	1.0
Trincomalee	1.0
Matale	0.7
Nuwara Eliya	0.7
Mannar	0.5
Polonnaruwa	0.5
Vavuniya	0.4
Ampara	0.3
Kilinochchi	0.2
Moneragala	0.2
Mullaitivu	0.1
	100.0

**Table 4: Average annual percentage burden of dengue in MOH Areas based on cumulative annual district total (MOH areas of Kalutara district were taken as examples)**

MOH Area	Historical trend based on MOH area percentage to the district total
Panadura	24.2
Beruwela(NIHS)	18.1
Kalutara (NIHS)	10.1
Wadduwa	8.9
Bandaragama	8.6
Horana	7.7
Matugama	5.7
Bulathsinhala	3.3
Dodangoda	3.3
Madurawala	2.6
Agalawatta	2.3
Ingiriya	2
Walallawita	1.9
Palindanuwara/Baduraliy a	1.3
Total	100

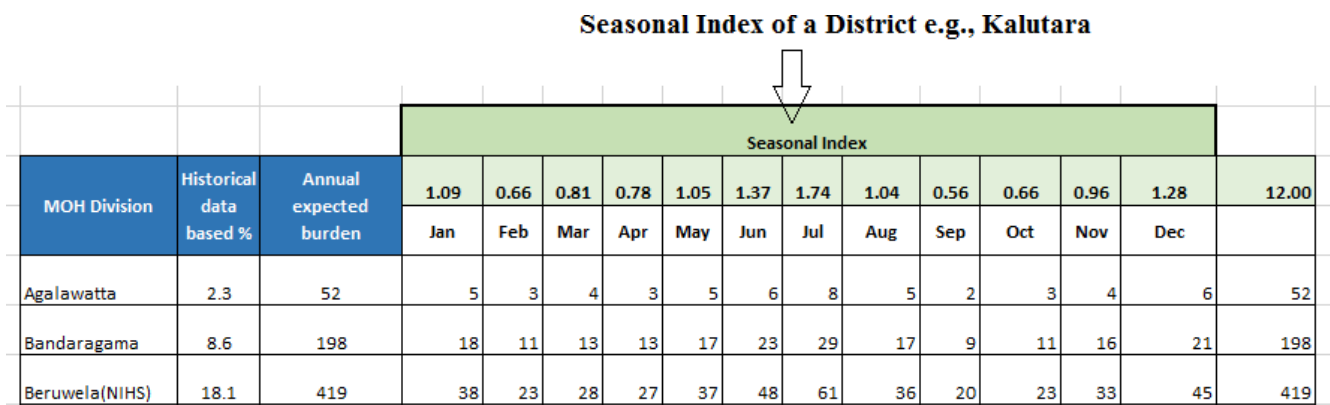
Above percentage values (Table 3 and 4) were used to indicate as default values in the database interface in deciding the expected district percentage and the MOH area level target calculations based on the set district target (Figure 1).

The next step was to convert the annual targets of districts and MOH areas to monthly targets. The seasonal variation is the best available indicator to convert annual case target of districts and MOH areas to monthly dengue case targets. <sup>[1]</sup> Therefore, Seasonal Index (SI) for each district was calculated. Minitab 2020 software was used to calculate the SI [4].



**Figure 1: The data required to be provided to get the information automatically.**

The SI for individual districts was computed using the monthly reported dengue patient numbers from 2012 to 2019 in a consecutive manner (Figure 2). The patient data for the years 2017 and 2019 displayed as extreme outliers in Minitab, resulting in a notably elevated mean absolute percentage error (MAPE). Consequently, these outliers were omitted during the calculation of the SI [5].



**Figure 2: Automatic update of the district Seasonal Index upon selected by the user.**

Comparing the SI of four randomly selected MOH areas within each district with the district's SI revealed a strong correlation (ranging from 0.7 to 0.94). This led to the assumption that the SI of each MOH area matches that of its respective district. As a result, the district's SI was utilized for

calculating the monthly targets of each MOH area. This approach was chosen to simplify the spreadsheet and avoid the complication of employing multiple formulae.

Drawing from historical trends and computed SIs, monthly maximum acceptable targets for dengue patients were established for each district and MOH area across Sri Lanka within the scope of the Program's control objectives. This equips district and MOH level operational managers, along with relevant public health personnel, to assess control progress by contrasting actual reported patient figures with these predetermined targets.

Several formulae were created in Excel spreadsheets for the construction of this target calculator. Users of this software tool simply need to choose the national targeted incidence for the specific year and the anticipated average percentage of dengue burden in the district compared to the overall country total. This can be done using

either the preset value in the software or an alternate percentage determined by experts. Following this, the tool can automatically compute the monthly targets for all districts and MOH areas spanning from January to December of the given year, and these results will be presented in graphical form.

The administrative clearance for this study was obtained from the Director of the NDCU to access the DenSys database and other secondary information. No personal and private primary or secondary data or restricted government data were used in this study. There was no conflict of interest of the researchers.

### 3.0 Results

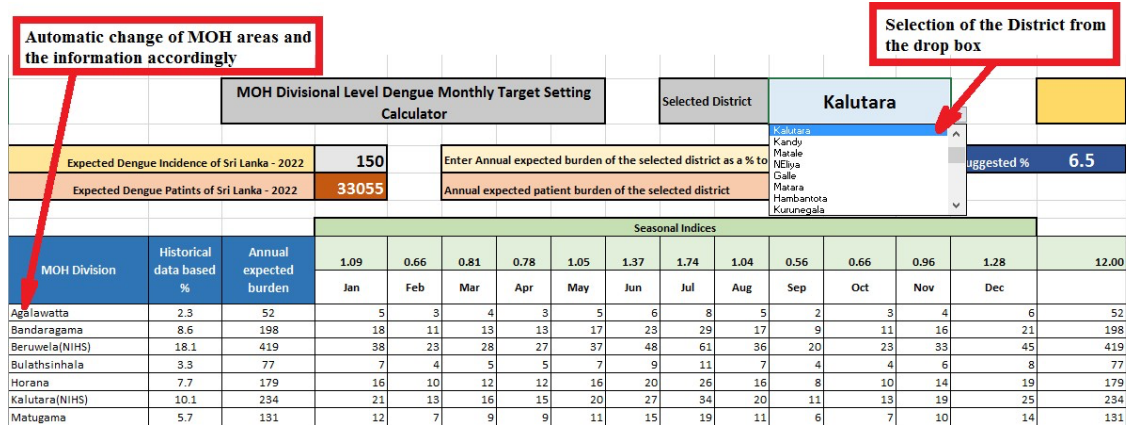
All districts and MOH areas had both yearly and monthly targets established. However, this article presents only a selection of districts and MOH areas to exhibit the calculator's results, staying within its article constraints. The software calculator adjusts the tables and graphs automatically based on the user's specifications (Figure 3a and 3b).

MOH Divisional Level Dengue Monthly Target Setting Calculator				Selected District		Gampaha									
Expected Dengue Incidence of Sri Lanka - 2022		150	Enter Annual expected burden of the selected district as a % to National t		16	>>>> Suggested % 15.3									
Expected Dengue Patints of Sri Lanka - 2022		33055	Annual expected patient burden of the selected district		5289										
Seasonal Indices															
MOH Division	Historical data based %	Annual expected burden	1.29	0.63	0.57	0.56	0.67	1.44	1.97	1.02	0.62	0.64	1.10	1.49	12.00
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Attanagalla/Veyangoda	6.5	344	37	18	16	16	19	41	56	29	18	18	32	43	344
Biyagama	7.5	397	43	21	19	19	22	48	65	34	20	21	36	49	397
Divulapitiya	3.0	159	17	8	7	7	9	19	26	13	8	8	15	20	159
Gampaha	8.0	423	46	22	20	20	24	51	69	36	22	22	39	53	423
Ja-Ela	7.0	370	40	20	17	17	21	44	61	31	19	20	34	46	370
Katana	6.0	317	34	17	15	15	18	38	52	27	16	17	29	39	317

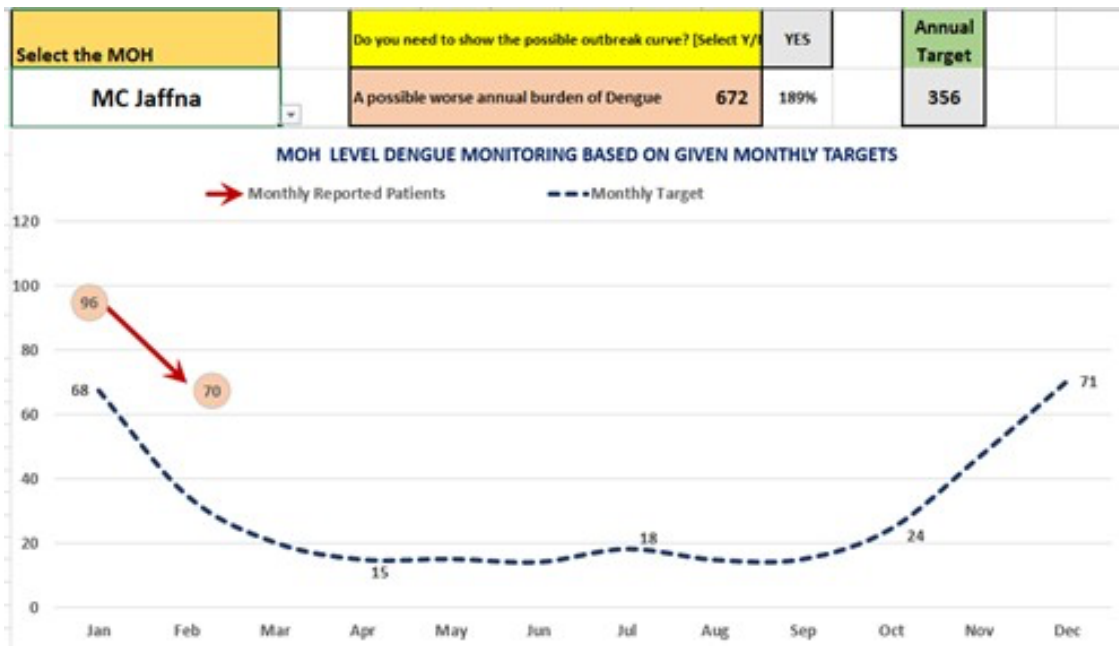
Figure 3a: Demonstrates the cells or drop boxes to add or select the National expected or targeted annual incidence, concerned district, and district burden (e.g., National incidence

is selected as 150/100,000 population, selected district: Gampaha and the expected percentage burden as 16% [by default database suggests 15.3% based on past trends])

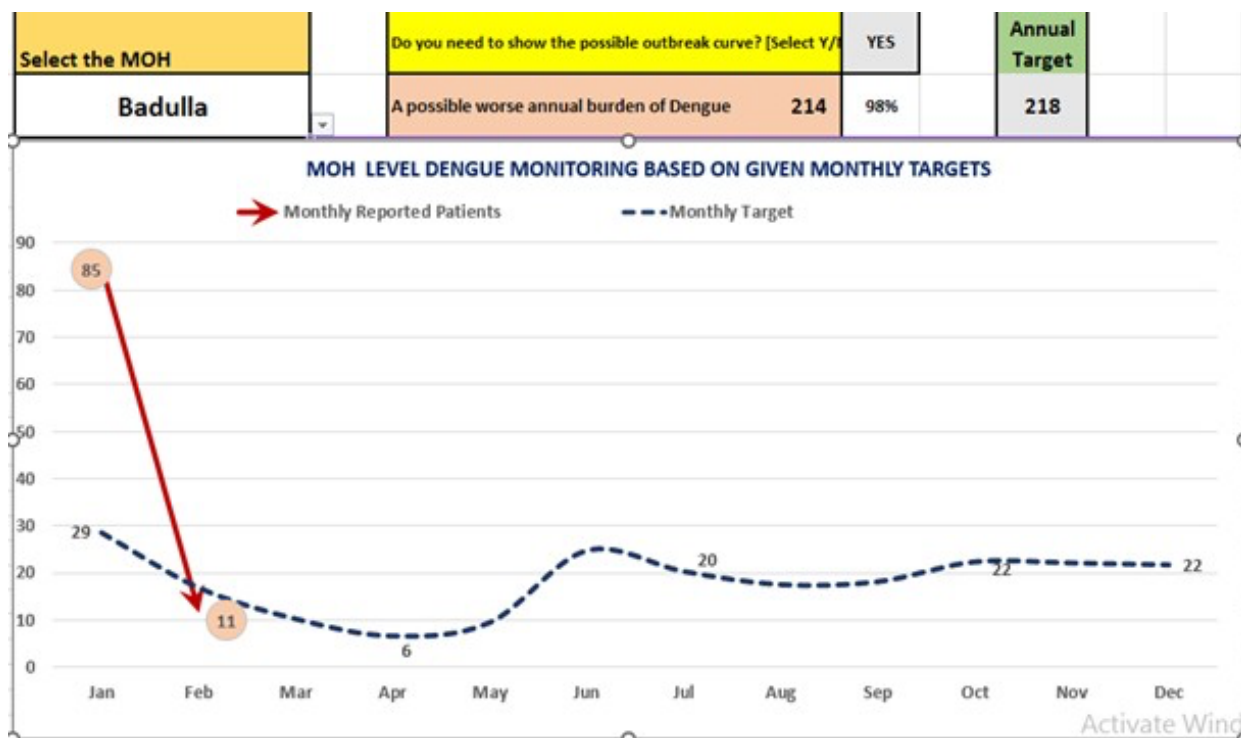
**Figure 3b: Demonstrates the changes according to the selected district.**



This tool demonstrates graphically the current trend in comparison to the monthly given targets to identify the degree of deviation. The MOH MC Jaffna and MOH Badulla were taken as examples to demonstrate (Figure 4a and 4b).



**Figure 4a: A MOH area (MC Jaffna) with declining trend of actual case burden from January to February but with a relatively higher degree of deviation from the monthly target which warrants more control measures.**



**Figure 4b: A MOH area (MOH Badulla) with very high monthly case burden in January compared to the monthly target but showed a rapid decline in the next month probably due to strong control measures.**

#### 4.0 Conclusions and Recommendations

This calculator can be used to enumerate the deviation of each district and MOH area from the national target.

The MOH areas which show significant upward deviation from the set monthly targets should take rapid and strong control measures including identification of clusters of local outbreaks and take appropriate actions [6].

This model can be incorporated to the ongoing enhancements of the dengue disease surveillance database.

MOH areas and districts that have achieved the stipulated targets can concentrate on sustaining the achieved results through programmatic improvements, innovations, and more resource allocations for system improvements.

#### Acknowledgment

The guidance given throughout the study by Dr. Samaraweera, S., the former Director of the National Dengue Control Unit and Prof. Abeynayake R., of Wayamba University of Sri Lanka on statistical approaches for target setting are gratefully acknowledged.



## References

1. National Dengue Control Unit, Ministry of Health, Sri Lanka. Surveillance database. Experts' opinion; 4/1/2022.
2. National Dengue Control Unit, Ministry of Health, Sri Lanka. National Action Plan – Prevention and Control of Dengue in Sri Lanka 2019-2023. ISBN 978-955-3666-16-1; 2019. p2.
3. Epidemiology Unit, Ministry of Health, Sri Lanka. Dengue Sentinel Site Surveillance database (DenSys); 2022.
4. Minitab. "Interpret all statistics and graphs for Decomposition." Available from: <https://support.minitab.com/en-us/minitab/20/help-and-how-to/statistical-modeling/time-series/how-to/decomposition/interpret-the-results/all-statistics-and-graphs/#:~:text=Minitab%20uses%20the%20indices%20to,to%20calculate%20the%20predicted%20values;> 2022.
5. Abeynayake, R. Institute of Applied Statistics. "Applied Statistics, Lecture notes on Trend Analysis." 22.01.2022.
6. National Environment Agency, Singapore. "Dengue cluster operations with alerting." Available from: [https://www.nea.gov.sg/dengue-zika/dengue/dengue-clusters;](https://www.nea.gov.sg/dengue-zika/dengue/dengue-clusters) 2022.

# Assessment of Nursing Performance Management Practices in the National Hospital of Sri Lanka

*Wijekoon W M C R., Wickremasinghe W K.*

## **Abstract**

**Introduction:** Performance management is an ongoing process that aims to identify, measure, and develop employee and team performance in line with an organization's strategies. It plays a crucial role in motivating employees and achieving organizational goals.

**Objective:** The study assessed the nursing performance management practices at the National Hospital of Sri Lanka

**Methods:** A case study was conducted utilizing a qualitative research approach. Key informant interviews were conducted with a special grade nursing officer, a nursing sister, two nursing officers, and a management assistant from the Administration branch. Thematic analysis identified major problems and their underlying causes. Pareto analysis aided in prioritizing the root causes. Additionally, telephone interviews were conducted with a professor specializing in Human Resource Management and a director from the Department of Human Resource Management in a leading private hospital to develop the proposed solution.

**Results:** The critical problems identified include inadequate integration with job descriptions, insufficient performance management planning, ineffective performance management processes, disintegration with administrative and clinical governance, and a weak performance review process. Pareto analysis highlighted the reliability and validity issues of the performance appraisal form as the primary root cause.

**Conclusion and Recommendations:** Among the weaknesses in the current nursing performance management system, the issues related to the reliability, validity, and acceptability of the annual performance appraisal form were highlighted. It is recommended to revise and enhance the form by adding specific components. Additionally, an action plan consisting of 20 steps has been formulated to improve the current performance appraisal process.

## **Introduction**

The National Hospital Sri Lanka (NHSL) is the largest Apex tertiary healthcare institution in Sri Lanka, with a capacity of 3269 beds. Similar organizations must develop unique characteristics in a dynamic environment to enhance their competitive advantages. Therefore, utilizing human resources, particularly employee performance, is crucial for strategic advantage (1). Hence, as the leading healthcare institute in the curative public health sector of Sri Lanka, NHSL should prioritize the effective improvement of nurses' performance management.

Performance Management (PM) is the continuous process of identifying, measuring, and developing individual and team performance to align with the organization's strategic goals (2). It involves goal setting, performance observation, coaching, feedback, and supporting the organization's competitive advantage. In contrast, performance appraisal (PA) is an annual evaluation that

systematically identifies employees' strengths and weaknesses, lacking the ongoing effort of feedback and coaching. While it is not a valid form of PM, it remains an essential component within the PM system (2).

An effective PM system offers numerous advantages (2), including:

1. Increased employee motivation and self-esteem through feedback
2. Enhanced insights for managers into subordinates' performance
3. Well-defined job criteria
4. Improved understanding of strengths and weaknesses
5. Clearer career development pathways
6. Fair and appropriate administrative decision-making regarding transfers, promotions, and rewards
7. Enhanced employee competency
8. Minimized employee misconduct and better compliance with regulations, reducing litigations.
9. Better identification of both poor and high performers
10. Heightened accountability of managers in discussing performance expectations and providing feedback to employees
11. Improved management of organizational change
12. Increased retention of high-performing employees
13. Encouragement for employees to voice their opinions.
14. Fostered innovation and heightened employee engagement.

Low-quality and poorly implemented PM systems have numerous negative consequences, including increased turnover, use of misleading information on

employee performance, lowered self-esteem from inappropriate and inaccurate feedback, wastage of resources, damaged relationships, reduced employee motivation, employee burnout, job dissatisfaction, heightened litigation risks, biases, unfair performance appraisals, and deviations from organizational standards (2).

No local research on nursing PM was found in an online literature review. However, research conducted on the PM of Public Health Midwives in the Kegalle District using mixed research methodology revealed partial PM implementation with many loopholes. Although the job description was defined, performance indicators and standards were deficient, and performance planning was rarely done (3).

Nursing officers play vital tasks in the healthcare delivery process; therefore, Assessing the PM practices of nursing officers (NOs) is crucial in identifying and addressing PM issues and preserving and optimizing PM benefits.

The NHSL, the apex referral Centre of the country, employed 2678 NOs and cared for over 270,000 patients in 2019. Hence, Nursing performance must meet expected standards to ensure patient safety and cost-effective care. Thus, this case study assessed the Nursing Performance Management Practices (NPMPs) at the NHSL.

### **Objective**

To assess the nursing performance management practices at the National Hospital of Sri Lanka

## **Methodology**

This Case Study was conducted by collecting data from Key Informant Interviews (KIIs) using a Structured Key Informant Guide (KIG) prepared based on the components of performance management phases: identifying prerequisites, performance planning, execution, monitoring, feedback, review, renewal, and providing inputs to the PM system and organizational strategic plan (2,4,5). The concepts and information gathered through a literature review(1,2,4,5). The KIG was pretested by presenting to a Nursing Officer.

KIIs were conducted with the voluntary participation of a Special grade nursing officer, a Nursing Sister, and two NOs. A Management Assistant responsible for NOs' Human Resource Management (HRM) provided preliminary information on the current PA process. Administrative clearance was obtained for data collection from the Deputy Director General of the NHSL. Patients were not interviewed or involved in this study.

Thematic analysis was conducted on KII data to identify significant problems and root causes of ineffective NPMPs. Pareto analysis was used to prioritize the causes

These problems are illustrated in the cause-and-effect diagram, as depicted in Figure No. 01.

of problems related to ineffective NPMPs and propose a prioritized solution for improvement. Telephone interviews were held with the professor in HRM at the University of Sri Jayewardenepura and the Director-Training, who has a postgraduate HRM qualification, from the HRM department in a leading private Hospital in Colombo (a Joint Commission International-accredited hospital). These interviews aimed to identify key components to include in the solution, followed by the identification of implementation steps for the proposed solution.

## **Results**

### **Problem analysis**

Six primary problems were identified as the leading causes of ineffective NPMP at the NHSL. These problems include,

1. Inadequate integration with the job description
2. Insufficient PM planning
3. Ineffectiveness of the PM process
4. Lack of integration with administrative governance
5. Lack of integration with clinical governance
6. Weak performance review process

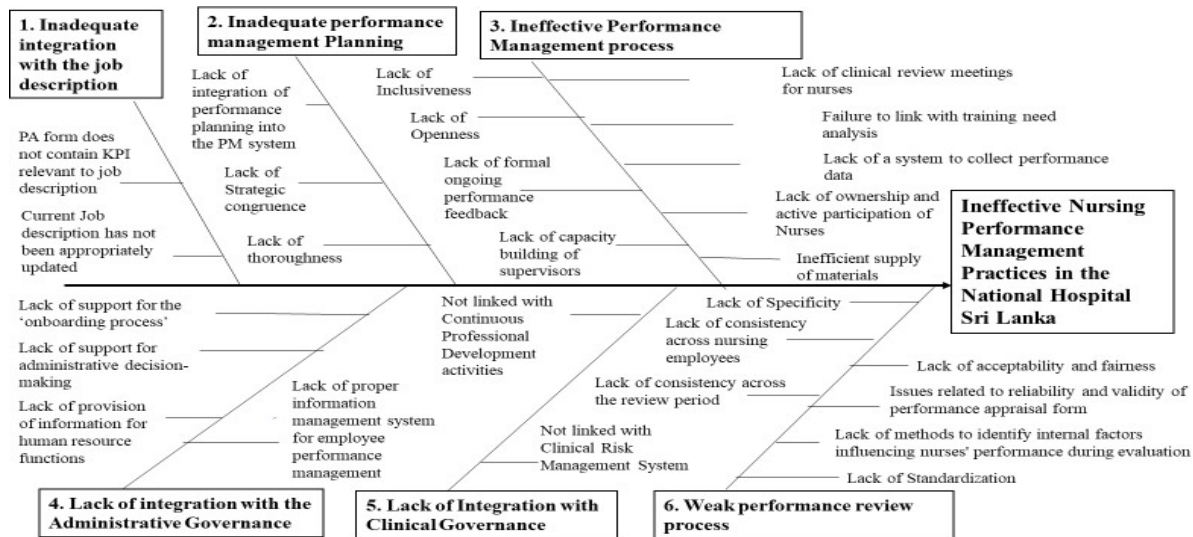


Figure 01: The cause-and-effect diagram illustrating the ineffective nursing performance management practices in the NHSL.

The problems and root causes leading to ineffective NPMPs, were identified through thematic analysis. Pareto analysis prioritized the causes of ineffective PM practices utilizing the inputs from three Medical Registrars holding postgraduate qualifications in Medical Administration. Factors such as the magnitude of the problem, availability of feasible solutions, and practicality of implementation were considered during prioritization. Table 01 presents the prioritized causes.

The Pareto analysis involved the selection of 19 root causes as the first step. Then, in the second round, participants voted for seven root causes. Figure No. 02 illustrates the cumulative percentage reaching 80%, indicating the five causes of ineffective PM practices.

Table 01: Results of prioritizing the identified root causes for ineffective NPMPs using the Pareto analysis.

Causes of Ineffective Nursing PM Practices		Frequency	Percentage %	Cumulative Percentage
1	Issues related to the reliability and validity of performance appraisal form	6	33.33	33.33
2	The PM system is not linked with Continuous Professional Development activities	3	16.67	50.00
3	Lack of a system to collect performance data	2	11.11	61.11
4	Lack of integration of performance planning into the PM system	2	11.11	72.22
5	Failure to link with training needs analysis	2	11.11	83.33
6	Lack of proper information management system for employee performance management	2	11.11	94.44
7	Lack of formal ongoing performance feedback	1	5.56	100
Total		18	100	-

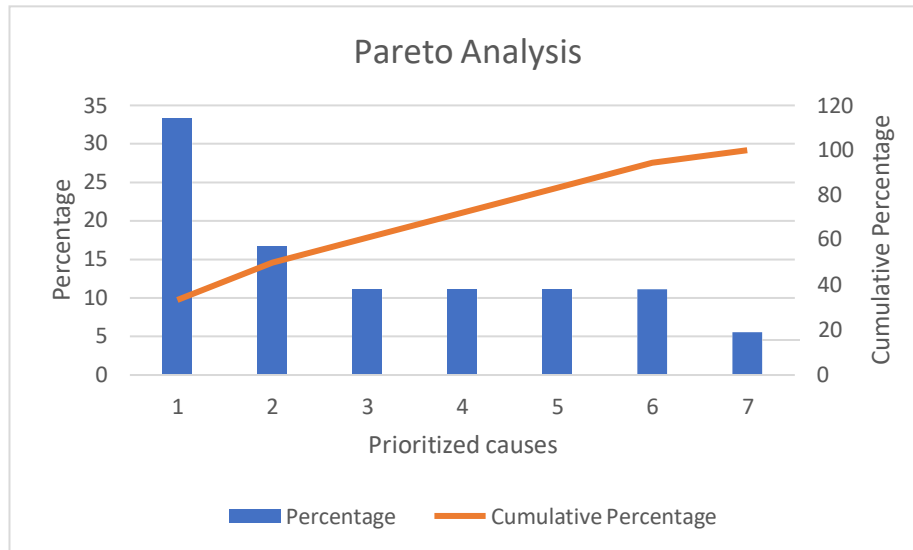


Figure No 02: Pareto Analysis to prioritize the root causes for ineffective Nursing Performance Management Practices (80/20 rule).

### Proposals

Based on the Pareto analysis, the five solutions identified to enhance PM practices were:

1. Improving the reliability and validity of the PA form.
2. Integrating CPD activities of nurses with the PM system.
3. Establishing a system to collect performance data.
4. Incorporating performance planning into the PA process.
5. Utilizing the information generated through the PM system for the training needs analysis.

Out of the five solutions, improving the reliability and validity of the PA form was identified as the prioritized solution. The interviews conducted with the Director-Training of the HRM department at the private hospital and the Professor in HRM at the University of Sri Jayewardenepura provided valuable insights into a newly updated PA system and assisted to identify the key components that should be included in the PA form. Based on that information, the following areas require

upgrading or addition to enhance the reliability and validity of the PA form.

1. Renew and update the job description through a thorough job analysis.
2. Identify and publish a list of key performance indicators (KPIs) relevant to nurses' performance in hospitals.
3. Include a section in the PA form to agree upon a minimum number of KPIs (e.g., at least 5) at the beginning of the performance period, in consultation with the supervisor.
4. Establish a rating system to evaluate the progress made in achieving the KPIs.
5. Integrate three meetings between the immediate supervisor and the nursing officer into the PA process.
  - a. First meeting at the start of the performance review period to agree on KPIs and document them, linking it to the annual performance review of the previous year.

- b. Second meeting at the midpoint of the performance review period to assess progress, update or revise KPIs, and identify development needs.
  - c. Third meeting with the supervisor and the sectional head to evaluate annual performance and identify development needs.
6. Ensure formal submissions of assessments made by the supervisor in at least two documents between the meetings.
  7. Include assessments of key behaviours in the PA form and establish a rating system.
  8. Integrate an assessment for participation in compulsory training.
  9. Enhance the component in the PA to identify specific development needs.
  10. Include a rating system for acknowledging special achievements.
  11. Assign weights to calculate the average score from the following components:
    - a. Ratings from KPI assessments.
    - b. Ratings from key behaviour assessments.
    - c. Ratings from participation in compulsory training.
    - d. Ratings from assessments of special achievements.
  12. Establish a link between the average score and annual increments and promotions.

The improvement process of the reliability and validity of the PA form was

conceptualized as a brainstorming exercise with the participation of two Medical Registrars with a postgraduate qualification in MSc medical administration and one Special Grade Nursing Officer. The process is described in the below steps.

1. Advocate the importance of improving the PA form to Ministry of Health officials.
2. Collaborate with relevant focal points in the Ministry of Health, such as DDG (Planning), DDG MS 1, DDG Admin 1, Director Nursing (Medical Service), and, to obtain administrative clearance for PA form improvement.
3. Identify and liaise with the delegated authority responsible for implementing the PA form revision process.
4. Identify the financial allocation for the activity and seek approval.
5. Identify experts in HRM.
6. Obtain consultation from the experts.
7. Conduct job analysis and update the job description.
8. Identify key performance indicators (KPIs) for nurses and publish them.
9. Identify strengths and weaknesses of the current performance appraisal form.
10. Identify components of the PA form that need development to improve validity and reliability.
11. Identify additional components that need to be added to the PA form to improve validity and reliability.
12. Involve nursing unions to gather their input for improving validity and reliability.

13. Appoint a committee to develop a new PA form and agree on a deadline for its completion.
14. Pretest the new PA form in a designated hospital and make necessary changes based on feedback.
15. Pilot the new PA form in a designated hospital to test its reliability and validity.
16. Finalize the new PA form with relevant changes.
17. Establish a plan to monitor and evaluate the success of implementing the new PA form.
18. Implement the new performance appraisal form in a scientifically selected sample of healthcare institutes.
19. Carry out monitoring and evaluation of the outcomes.
20. Prepare a final report and make suggestions for further improvement of the PA form.

By following these steps, the reliability and validity of the PA form can be enhanced, leading to more effective PM processes in healthcare institutes.

### **Discussion**

The identification of the five prioritized causes out of many causes of ineffective PM practices guided the formulation of proposals to enhance the PM process. Improving the reliability and validity of the PA form is an excellent solution, as this improvement will enhance the quality of performance evaluation by addressing strategic congruence, standardization, validity, reliability, ongoing feedback, and the perception of justice and fairness within the system. Additionally, it will serve as a motivation factor for NOs.

Integrating the CPD activities of nurses with the PM practices will facilitate the identification of CPD needs and the evaluation of the effectiveness of these activities. However, without having a valid and reliable PA form, identification of CPD needs will not be effective.

Establishing a performance data collection system is crucial for assessing individual, unit, and organizational performance. It will enhance performance planning, enable ongoing feedback, and provide valuable inputs to the PM system. The approach must require a good PA form to collect performance data.

Including performance planning in nursing PM practices is vital. This can be achieved by scheduling a performance planning meeting between the nursing officer and supervisor at the start of the performance review period, in addition to the development of the PA form. During this meeting, specific performance behaviours and expected outcomes aligned with the organization's goals and unit objectives can be identified.

Incorporating information from the PM system into the training needs analysis is a crucial component of an effective PM system. To achieve this, a methodology should be developed to utilize the training needs identified through the PM process for analysis by the hospital's planning and development unit. A valid and reliable PA form is a prerequisite for this activity.

Considering these findings, it's evident that enhancing the reliability and validity of the PA form is interlinked with the other solutions proposed in this case study, which will collectively improve the overall effectiveness of the PM process. Furthermore, the insights given by the



Director-Training of the HRM department at the private hospital and the Professor in HRM at the University of Sri Jayewardenepura would improve the overall reliability and validity of the PA system for nursing performance. Moreover, the 20-step implementation plan shows the way forward to the overall improvement of the PM process by enhancing the PA form's reliability and validity.

### **Conclusion**

The current nursing PM system has multiple weaknesses. It consists of an annual performance appraisal (PA) that suffers from reliability, validity, and acceptability issues. The critical problems identified in the nursing PM system include inadequate integration with job descriptions, insufficient PM planning, ineffective PM processes, lack of integration with administrative and clinical governance, and a weak performance review process.

The Pareto analysis identified five main root causes leading to ineffective NPMPs. Those problems, according to descending order of the frequency of voting, were issues related to the reliability and validity of the performance appraisal form, PM system not linking with CPD activities, lack of a system to collect performance data, lack of integration of performance planning into the PM system, and failure to link with training need analysis.

Based on the highest number of votes received and its connection to other crucial aspects of the performance review process, improving the reliability and validity of the PA form was chosen as the prioritized solution to enhance NPMPs. Consequently, a comprehensive action

plan was developed, consisting of 20 steps to improve the current PA form. The plan begins with advocating to the ministry officials and includes revising and adding necessary components to the form.

### **Recommendations**

This comprehensive analysis emphasizes the pressing need to overhaul nursing PM practices. Central to the identified issues is the PA form. Its current shortcomings in reliability and validity threaten the effectiveness of the entire PM system. Therefore, the first and foremost recommendation is a thorough refinement of the PA form. This foundational change will significantly influence other facets of the nursing PM process.

The Ministry of Health is recommended to meticulously adopt the proposed 20-step implementation plan to ensure the systematic and holistic improvement of a refined PA form, initiating the advocacy at the Ministry of Health level. The 20-step plan focuses on teamwork, resource allocation, and expert consultation. Furthermore, it requires detailed updates of job roles and key performance indicators. This process emphasizes the necessity of involving diverse stakeholders, from nursing unions to experts in HR. Their insights and feedback will be invaluable in refining the PA form and ensuring its acceptability and relevance. It also recommends pre-testing and piloting the form before a broader launch, ensuring that it is tailored to the professional needs of the nurses.

In essence, while there are several areas for improvement in the nursing performance management system, the core lies in the reliability and validity of the PA form. By improving the PA form, the

Ministry of Health can develop a management system for nurses. comprehensive and effective performance

### References

1. Diamantidis AD, Chatzoglou P. Factors affecting employee performance: an empirical approach. *International Journal of Productivity and Performance Management*. 2019 Jan 11;68(1):171–93.
2. Aguinis H. *Performance Management Third Edition*. 3rd ed. Pearson Education; 2013.
3. P K Wickramasinghe. Reviewing Performance Management of Public Health Midwives – Health Department in Kegalle District of Sri Lanka [Internet]. Researchgate. 2020 [cited 2023 May 29]. Available from: [https://www.researchgate.net/publication/345139691\\_Reviewing\\_Performance\\_Management\\_of\\_Public\\_Health\\_Midwives\\_-\\_Health\\_Department\\_in\\_Kegalle\\_District\\_of\\_Sri\\_Lanka](https://www.researchgate.net/publication/345139691_Reviewing_Performance_Management_of_Public_Health_Midwives_-_Health_Department_in_Kegalle_District_of_Sri_Lanka)
4. Armstrong M. *Managing Performance*. In: *How to Manage People*. Philadelphia PA 19147, New Delhi 110002; 2011.
5. Opatha H. Employee Performance Evaluation Systems: An Evaluative Study of Selected Public Quoted Manufacturing Firms in Sri Lanka. *Sabaragamuwa University Journal* (ISSN 1391-3166). 2003 Mar 1;03:137–53.

# Factors affecting occupational radiation safety among selected categories of staff of the National Hospital of Sri Lanka, Colombo

Arachchi KANLK, Dharmagunawardene D

## Abstract

## Introduction

Radiological imaging has significantly improved the quality of healthcare. However, it is not without risks of occupational exposure to radiation which can be prevented or mitigated by adopting policies, procedures, and practices.

## Objective

To assess the factors that affect occupational radiation safety among radiographers, nurses, and support staff of the National Hospital of Sri Lanka (NHSL) Colombo who were at risk of exposure to ionizing radiation.

## Methodology

A cross-sectional descriptive study was carried out by selecting the entire population of the selected categories. Self-administered questionnaires, structured focused group discussions, and observatory visits were used to collect the required data. Data were analysed both quantitatively and qualitatively.

## Results

The overall response rate of the surveys was 65.5%. The mean awareness score on radiation safety was high among radiographers. The attendants and the healthcare assistants had the lowest scores. Generally, males had a higher awareness score compared to their female counterparts. However, the difference was not statistically significant. The mean score on safety practices (safety score) was

high among radiographers compared to other categories. The difference was statistically significant. Unlike the awareness score, the safety score among female counterparts and its difference was statistically significant. It was evident that unskilled and semi-skilled categories were at a higher risk of getting exposed to ionizing radiation compared to skilled categories.

## Conclusions

The dormant Radiation Protection Program (RPP) triggered by the absence of a formally appointed Radiation Protection Officer (RPO) was recognized as a challenging factor in ensuring occupational radiation safety at the NHSL.

## Recommendations

Having a RPO to sustain the institutional RPP, developing institutional standards for limiting occupational exposure to radiation, encouraging all the workers at risk to undergo a compulsory periodic assessment of radiation exposure, and conducting training programs to enhance radiation protection among the workers are therefore recommended.

**Keywords:** Occupational safety, Radiation protection, Radiological imaging

## Introduction

Radiological imaging has significantly improved the quality of healthcare. Technical advancement in medical imaging has now convinced many clinicians who previously had relied on

clinical examination rather than on investigation data [1]. The benefit of interventional radiology to patients, like in cardiology, is beyond any disputes. However, many of these procedures can cause radiation effects on staff [2].

The imaging department of the National Hospital of Sri Lanka (NHSL) offers a range of radiological services that vary from the conventional type of imaging to the most advanced post-processed digital imaging. Hence, the department offers such services as general X-rays, CT and PET scanning, Gamma imaging, fluoroscopy, and interventional radiology. Being the apex of public sector curative care in Sri Lanka, the number of patients received by the NHSL remains high. This number includes those who get referred for further investigations as well. Hence, the routine number of radiological imaging performed by the NHSL tends to be large. For instance, the number of X-rays and CT scans performed in the year 2015 was nearly 430,000 and 52,000 respectively [3].

Occupational radiation exposure can be prevented or mitigated by the appropriate adoption of policies, procedures, and practices. Such initiatives are known as Radiation Protection Programs (RPPs). They include rules and procedures to follow, supply of personal protective equipment (PPE), ongoing training and education on radiation safety, individual exposure monitoring, and periodic performance evaluations and audits [4].

Obtaining an optimal radiological image is a trade-off between the quality of the image and the degree of exposure. Thus, the goal of optimization in radiological imaging is to obtain a high-quality image

at the lowest possible dose of radiation [5]. However, the radiation dose and the quality of the image are inherently dynamic. They are affected by patient attributes, technology, clinical context, and the type of investigation. Any attempt to optimize the safety of radiography should take the above factors into account. A measure like Quality-Safety Index Score (QSI) would, therefore, generate a way of viewing quality and safety in tandem. This is of particular importance when the service providers strive to maximize the values based on clinical priorities [6].

Safety is a corporate responsibility. It requires commitment from all stakeholders. The management at all levels should be involved in improving safety practices. The decision-making should reflect *safety first*. Questioning attitudes and error reporting will enhance safety practices. However, such attributes will depend on the trust that permeates the organization. Organizational learning and supervision will ensure good operational performance while paving the path to continuous improvements in quality and safety. Any factor that compromises any of the attributes above tends to challenge the safety of radiological imaging [7]. Higher thresholds in error reporting, reluctance to challenge the authority, fear of disrespect and lack of attention to event reporting can act as barriers to effective safety practices [8].

Strategies to optimize quality and safety in radiological imaging are no different from other disciplines in medical sciences. Standard dose calculation, protocol optimization, calculating dose-to-quality indices, creating best-practice guidelines, examining appropriateness through audits,

careful quality control, quantitative measures of technology efficiency, continuous education and training, certification, and culture of error reporting are among them [5, 9].

Explicit standards for the safe use of ionizing radiation are ample. Publications made by the International Atomic Energy Agency (IAEA) [10, 11, 12], and the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) [13], are some examples. Although Sri Lanka has no published standards on radiation safety, the Gazette Extraordinary No. 1142/30 of 28<sup>th</sup> July 2000 regulates the protection against ionizing radiation and safety settings. However, of the plain X-ray rooms available in Sri Lanka only about 86% had a space above the recommended (25 m<sup>2</sup>), while about 89% complied with the safe distance (2 m) between the radiation source and the operator. About 36% of the rooms did not have the recommended wall thickness, whilst only 12.5% had warning signs/lights while in operation. Although 97% had lead aprons provided, their quality was not assured. Only about 95% of the staff had been provided with Thermo-Luminescent Dosimeters (TLDs) [14].

### **Objective**

To assess the factors that affect occupational radiation safety among selected staff categories of the National Hospital of Sri Lanka, Colombo.

### **Methodology**

A cross-sectional descriptive study was designed and carried out at the Radiological Department of the NHSL where ionizing radiation is used to perform

radiological imaging. The entire population of the selected categories: Radiographers, Nurses, and support staff (Attendants and Health Assistants) who were at risk of occupational exposure to ionizing radiation was included in the study. The estimated sample comprised 80 Radiographers, 48 Nurses, 7 Attendants, and 65 Health Assistants. Two sets of self-administered questionnaires (one for the Radiographers and one for the other categories), three structured focused group discussions with respective categories and administrators, and several observatory visits were done to collect the data. Data were analysed both quantitatively and qualitatively. Among the selected categories, awareness of radiation safety, the safeness of practice, radiation safety training, the use of personal protective equipment, adherence to safety guidelines, regulations, and standard practices such as dose calculations, safety checks, error and event reporting, and emergency response preparedness were assessed as factors affecting occupational radiation safety. The factors: radiation safety awareness and safeness of practice were analysed quantitatively, whereas the remaining variables were analysed qualitatively. The statistical significance of associations was tested using the Chi-square test of categorical variables at a 95% confidence level of avoiding an alpha error. Following an inductive approach to data exploration, the qualitative data were submitted to a thematic analysis that encompassed the topics and their relationships.

### **Results**

The estimated number at risk of occupational exposure to ionizing radiation was 200 at the NHSL. Out of them, 52

Radiographers, 36 Nurses, 3 Attendants, and 40 Assistants responded to the questionnaires. The overall response rate was 65.5%.

### **Awareness of radiation safety**

The mean awareness score on radiation safety was the highest ( $\bar{x}$ =9.92, SD=1.35) among Radiographers. However, it was a moderate score when compared to its measuring scale (Low: 0-7, Moderate: 8-10, High: 11-12). The Attendants ( $\bar{x}$ =7.33, SD=0.57) and the Assistants ( $\bar{x}$ =7.73, SD=1.22) had lower scores compared to Nurses ( $\bar{x}$ =8.94, SD=0.92). The Chi-square test indicated that there was a statistically significant ( $X^2$  24.272, df 4,  $p < 0.001$ ) association between the category of service and the level of awareness at a 95% confidence level. It implied that the awareness of radiation safety was significantly different from one category to another.

The mean awareness score on radiation safety among male Radiographers was 9.93 (SD 1.43) while it was 9.86 (SD 0.69) among the females. The Chi-square test indicated that there was not statistically significant ( $X^2$  4.187, df 2,  $p=0.123$ ) association between gender and the level of awareness at a 95% confidence level. It implied that the awareness of radiation safety was the same irrespective of gender among the Radiographers.

### **Safeness of the practice**

The mean score on radiation safety practices (safety score) was the highest ( $\bar{x}$ =13.94, 95% CI=12.96-14.92, SE=0.487) among Radiographers. The mean safety score among the other categories combined was 10.52 (95%

CI=9.59-11.44, SE=0.465). It indicated that the degree of occupational exposure to ionizing radiation was high among the other categories compared to Radiographers. The Chi-square test indicated that there was a statistically significant ( $X^2$  10.806, df 4,  $p=0.029$ ) association between the category of the service and the safety score at a 95% confidence level. It implied that occupational radiation safety was significantly different from one category to another.

The safety score of female Radiographers was higher ( $\bar{x}$ =16.86, SD=3.62) than the males ( $\bar{x}$ =13.49, SD=3.31). The Chi-square test indicated that there was a statistically significant association between gender and the level of radiation safety ( $X^2$  8.286, df 2,  $p=0.016$ ) at a 95% confidence level. It implied that the radiation safety practices were significantly better among female radiographers compared to their male counterparts.

### **Training on radiation safety and supply of personal protective equipment**

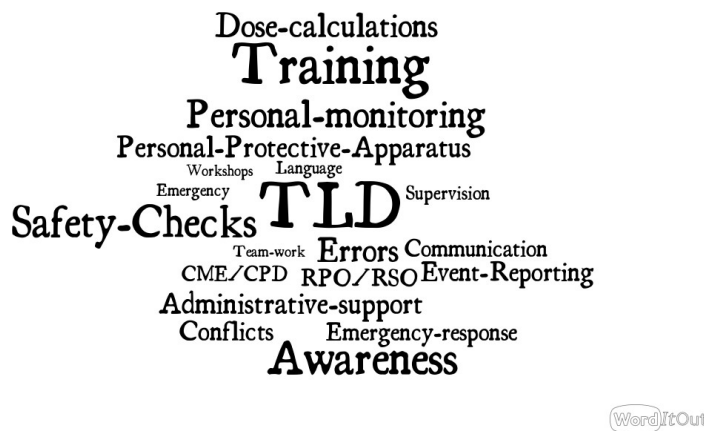
About 94% (n=74) of the respondents had not received training on radiation safety. Almost 71% (n=56) of them had not received satisfactory guidance for safe radiological practices either from their superiors or supervisors. Moreover, 78.5% (n=62) had claimed that radiation shields and other protective wearables were not available adequately.

### **Focus group discussions**

The word-cloud image in Fig. 1 has been based on the frequency of the terms

(themes) that were stressed during the FGDs. The following description assumed that each theme's relative importance was

proportional to its frequency and perceived seriousness of the underlying situation.



**Figure1.** Word-cloud image of the inducted themes of the FGDs

It was agreed that the best method of monitoring occupational radiation exposure is the proper use of TLDs. However, inadequate supply, inappropriate use, and insufficient reading of TLDs had seriously compromised individual monitoring. Although there were advanced methods of monitoring radiation levels at the workplace, those were hardly ever used. TLDs are read and reported by the Atomic Energy Board (AEB) of Sri Lanka. The Radiation Protection Officer (RPO) was expected to coordinate the process and proceed with the recommendations. Improper use, insufficient care, and inadequate safety checks of PPEs had compromised individual exposure protection. Error communication and event reporting were not practiced effectively. It had not been common practice to do tasks like upgrading technical knowledge, calculating the standard dose, and developing dose-to-quality indices, which are some of the techniques that can improve safety and quality of

radiography. In fact, such practices were compromised because of the absence of a formally appointed RPO. Nevertheless, the dysfunctional status of a RPO had seriously affected the strategies that can help to optimize quality and safety of radiological imaging such as protocol optimization, establishing best-practice guidelines, conducting audits, ensuring quality control, and measuring technology efficiency. Unfortunately, appointing a RPO had been affected by a Trade Union struggle between Radiographers and Medical Physicist. In conclusion, the NHSL did not have an effective RPP in place due to the absence of a formally appointed RPO.

### Observations

General safety measures such as displaying notices and warning signs, marking safe zones, maintaining signposts, restricting unauthorized access, and emergency preparedness were satisfactory in places other than the plain X-ray

chambers where radiation exposure happens frequently. Furthermore, attention to material safety, personal protection, keeping operating manuals, using technical references, and displaying emergency response were not satisfactory in places other than CT and PET units. Error or event reporting was not practiced at any place.

## Discussion

As Cole et al., [7] correctly argued, the safety of the staff tends to be overlooked where patient care is given priority. May be influenced by social values, the staff also tends to trivialize their safety for the sake of their patients. Nevertheless, it brings healthcare managers an obligation to make them safe at their workplaces. This is of particular importance where ionizing radiation is used for medical imaging. As Le Heron *et al.*, [4] argued, the RPP of an institution should comply with standardized personal protection, continuing awareness and education of the workers, and consistent monitoring for radiation safety. The absence of those attributes has led to a compromised state of quality and safety at the Radiology Department of the NHSL.

This study identified several gaps that compromised occupational safety in radiological imaging at the NHSL. Insufficient attention to such practices as standard dose calculation, optimizing procedures, estimating dose-to-quality indices, generating practice guidelines and protocols, performing audits, ensuring quality control, facilitating error and event reporting, continuous training and development, and compliance certification, was identified as the most pressing of all. However, it was largely attributable to the

absence of a properly functioning RPP at the hospital which in fact has to operate by a RPO. Unfortunately, appointing a RPO at the NHSL has been long due because of an ongoing union struggle between Radiographers and Medical Physicists for the post. The negative impact that it had imparted on the safety practices of radiological imaging is indisputable.

## Conclusion and recommendations

This study assessed the factors that can affect occupational radiation safety at the NHSL Colombo by studying selected categories of staff at risk. It was revealed that unskilled (i.e., Health Assistants) and semi-skilled (i.e., Health Attendants) categories are at a higher risk of getting exposure to ionizing radiation compared to skilled categories such as Nurses and Radiographers. The overall assessment of safety awareness and safety practices was attributable to a moderate level by the scale of measurement used in this study. It was further identified that the absence of a RPP triggered by the absence of a formally appointed RPO has been a substantial contributory factor to the failing outcomes in radiation protection. Therefore, to have a formally appointed RPO to sustain the institutional RPP, to develop and implement institutional standards for limiting occupational exposure to radiation, to encourage all the workers at the Radiology Department to engage with an appropriate program to uplift their knowledge, skills, and practices in safe radiological imaging, to conduct compulsory assessments of individual exposure, and periodic assessment of technology efficiency are recommended to ensure effective protection against



occupational exposure to ionizing radiation of those who are at risk.

## References

1. European Society of Radiology (2011). White paper on radiation protection by the European Society of Radiology. *Insights into Imaging*, [online] 2(4), pp.357–362. Available at: <https://link.springer.com/article/10.1007/s13244-011-0108-1> [Accessed 12 Apr. 2020].
2. Durán, A., Hian, S.K., Miller, D.L., Le Heron, J., Padovani, R. and Vano, E. (2013). Recommendations for occupational radiation protection in interventional cardiology. *Catheterization and Cardiovascular Interventions*, [online] 82(1), pp.29–42. Available at: <http://doi.wiley.com/10.1002/ccd.24694> [Accessed 12 Apr. 2020].
3. National Hospital of Sri Lanka. (2017). *Annual Report of the National Hospital of Sri Lanka, Colombo*. NHSL Colombo.
4. Le Heron, J., Padovani, R., Smith, I. and Czarwinski, R. (2010). Radiation protection of medical staff. *European Journal of Radiology*, 76(1), pp.20–23.
5. Reiner, B.I. (2009). Quantifying Radiation Safety and Quality in Medical Imaging, Part 2: The Radiation Scorecard. *Journal of the American College of Radiology*, 6(9), pp.615–619.
6. Reiner, B.I. (2014). The Quality/Safety Medical Index: a Standardized Method for Concurrent Optimization of Radiation Dose and Image Quality in Medical Imaging. *Journal of Digital Imaging*, 27(6), pp.687–691.
7. Cole, P., Hallard, R., Broughton, J., Coates, R., Croft, J., Davies, K., Devine, I., Lewis, C., Marsden, P., Marsh, A., McGearry, R., Riley, P., Rogers, A., Rycraft, H. and Shaw, A. (2014). Developing the radiation protection safety culture in the UK. *Journal of Radiological Protection*, 34(2), pp.469–484.
8. Siewert, B., Swedeen, S., Brook, O.R., Eisenberg, R.L. and Hochman, M. (2018). Barriers to Safety Event Reporting in an Academic Radiology Department: Authority Gradients and Other Human Factors. *Radiology*, 288(3), pp.693–698.
9. Frija, G. (2015). Quality and Safety in Radiology: A Symbiotic Relationship. *HealthManagement*, [online] 15(3). Available at: <https://healthmanagement.org/c/healthmanagement/issuearticle/quality-and-safety-in-radiology-a-symbiotic-relationship> [Accessed 11 Apr. 2020].
10. IAEA (2018a). *IAEA Safety Standards for Protecting People and the Environment Radiation Protection and Safety in Medical Uses of Ionizing Radiation Jointly sponsored by PAHO WHO Specific Safety Guide No. SSG- 46*. [online] Vienna: International Atomic Energy Agency. Available at: [https://www-pub.iaea.org/MTCD/Publications/PDF/PUB1775\\_web.pdf](https://www-pub.iaea.org/MTCD/Publications/PDF/PUB1775_web.pdf) [Accessed 12 Apr. 2020].
11. IAEA (2018b). *IAEA Safety Standards for protecting people and the environment Occupational Radiation Protection Jointly sponsored by General Safety Guide No. GSG- 7*. [online] Vienna: International Atomic Energy Agency. Available at: [https://www-pub.iaea.org/MTCD/Publications/PDF/PUB1785\\_web.pdf](https://www-pub.iaea.org/MTCD/Publications/PDF/PUB1785_web.pdf) [Accessed 12 Apr. 2020].

12. IAEA (2018c). *IAEA Safety Standards for protecting people and the environment Specific Safety Guide Establishing the Infrastructure for Radiation Safety*. [online] Vienna: International Atomic Energy Agency. Available at: [https://gnssn.iaea.org/CSN/Radiation\\_Safety\\_Infrastructure/Shared%20Documents/SSG-44.pdf](https://gnssn.iaea.org/CSN/Radiation_Safety_Infrastructure/Shared%20Documents/SSG-44.pdf) [Accessed 11 Apr. 2020].
13. ARPANSA (2008). *CODE OF PRACTICE Radiation Protection in the Medical Applications of Ionizing Radiation*. [online] Victoria: Australian Radiation Protection and Nuclear Safety Agency. Available at: <https://www.arpansa.gov.au/sites/default/files/legacy/pubs/rps/rps14.pdf> [Accessed 12 Apr. 2020].
14. Nilantha, W., Pallewatte, A. and Rajendra, J. (2015). A study on plain radiography rooms in Sri Lanka with emphasis on radiation protection. *Sri Lanka Journal of Radiology*, 1(0), p.13.

# Process improvement of fund allocations for in-service training programs at the Education, Training and Research Unit Ministry of Health Sri Lanka

*G S P Ranasinghe, S B De Alwis, P V D S Dharmagunawardene*

## Abstract

### Background

The Ministry of Health, Sri Lanka allocates a considerable amount of funds for capacity building of health workers through on-the-job training. Continuous Professional Development (CPD) is a lifelong process, which is essential to update the current knowledge and practices of healthcare staff to deliver quality and safe health care services. With this intention, funds are allocated for In-Service Training Programs (ISTP) from the Education, Training, and Research (ET&R) Unit, Ministry of Health, Sri Lanka to healthcare institutions every year from the health budget. Timely dispersion of funds is a vital factor to conduct these programs effectively.

### Objective

To improve the fund allocation process for the in-service training programs funded by the ET&R Unit Ministry of Health, Sri Lanka

### Methodology

This Quasi-Experimental research project was conducted in three phases. Phase I was the pre-intervention, Phase II was the intervention and Phase III was the post-intervention. Quantitative data was gathered using a Questionnaire and a Checklist in Phase I and III. A random sample of 55 institutional focal points was selected for the study. Key Informant Interviews and Focus Group Discussion

were used to gather qualitative data in Phase I and III related to the fund allocation process. In Phase II the interventions carried out were the establishment of in-service training focal points, introduction of web-based detail information on proposal submission on Ministry of Health website, conduction of workshops and training on proposal writing and fund allocation processes, establishment of the in-service database at the ET&R Unit Ministry of Health and introduction of electronic submission system.

### Results

Results showed that the incompleteness of ISTP proposals, delays in receiving proposals, errors in title, objective, and justification were overcome significantly (at  $p < 0.05$  level) along with the availability of ISTP focal points at the institutional level. There were significant improvements of inadequate resources at focal points after the intervention. The awareness of ISTP Excel format, awareness of the latest paying circular and awareness on how to fill the project component in the format, and awareness on how to fill the payment component improved significantly at the  $p < 0.05$  significance level. Availability of Human Resource Development plan, availability of annual training plan, training need identification, prioritization of the training needs, conduction of progress reviews and monitoring of ISTP, financial progress at the institutional level, and timely reception of funds have improved significantly with

$p < 0.05$  significance level. The overall satisfaction of the Focal Points has improved  $p < 0.001$  level. The processing time taken for issuing a fund allocation letter from the point of receiving the proposal to the ET&R Unit was significantly improved at the  $p < 0.001$  level.

## Conclusions

There was a significant improvement in the fund allocation process reflecting the

## Background

The Ministry of Health, Sri Lanka allocates a considerable amount of funds for capacity building of government health workers through individual training that is requested by an individual for their training needs, and through institutional training for recognized training needs by the respective healthcare institutions (1).

Continuous Professional Development (CPD) is a lifelong learning that is necessary to update the current knowledge and practices of the healthcare staff to deliver quality and safe health care services, with the changing environment (2). In-service training programmes are planned on the job training programmes that are conducted annually by healthcare institutions in order to update the knowledge, skills, and attitudes of healthcare staff.

The Education, Training, and Research (ET&R) Unit, Ministry of Health, Nutrition and Indigenous Medicine, allocates funds from the annual health budget for In-Service Training Programs (ISTP) to conduct trainings by the healthcare institutions. These in-service training programs are mainly focused on professional development at the

interventions that carried out were effective. This sequentially gave a significant enhancement to the conduction of ISTP in Sri Lankan healthcare institutions to help for improving staff training.

**Key Words:** *Process Improvements, In-service Training Programmes*

institutional level according to the recognized training needs in the respective healthcare institutions. ISTP, not only give a positive impact on the quality of care, and it is also an effective tool to measure the results quantitatively and qualitatively (3). A comprehensive 4-day training programme to the staff has created a significant improvement in essential newborn care practices in obstetric units (4), reflecting the importance of ISTP.

ET&R Unit has allocated Rs. 63 million from the annual health budget to fund ISTP in 2017. These funds needed to be distributed effectively and efficiently to carry out the In-Service Programmes effectively, and the process improvement is vital in achieving this objective. Process improvement is a strategic approach that identifies, analyse, and refine the existing processes and improve them, and contributes towards increased efficiency, cost reduction, improved end-user experience, and also strong adherence to the best practices and regulations(5) and it is a systematic approach for the closing of system performance gaps, through streamlining, reduction in cycle time, identification and elimination of causes of below specifications quality, process variation, and non-value-adding

activities (6). It has been shown that the lean interventions including process mapping trigger four different change mechanisms and they are understanding the processes, organizing, and designing for effectiveness and efficiency, improving error detection to increase awareness and process reliability, and collaborating systematically to solve problems and to enhance continual improvement (7). Adaptation of these relevant concepts was done during the process improvement in this intervention research project.

### **Objective**

To improve fund allocation process for the in-service training programs funded by ET&R, Ministry of Health.

### **Methodology**

This research project was conducted in three phases, namely Phase I situational analysis, Phase II introduction of appropriate interventions for identified gaps in Phase I, and Phase III to assess the effectiveness of the intervention for the identified gaps.

In the Phase I, Key Informant Interviews (KII) were performed to understand the fund allocation process in the ET&R Unit Ministry of Health and a Focus Group Discussion (FGD) was done with Institutional Focal points, and a questionnaire was given to collect quantitative data such as lead time and satisfaction. A checklist was used to identify the gaps in the ET&R unit. In the Phase II, the interventions were done for the identified gaps in phase I, after designing the appropriate solutions. Following interventions were implemented in phase II.

- Process mapping was carried out to identify the gaps and to design the interventions. Interventions were implemented for incremental improvements based on the finding in the process map (Annexure I),
- Guidelines and ISTP application formats were made available in the Ministry of Health, Nutrition and Indigenous Medicine website (URL – [www.health.gov.lk/moh\\_finale/english/others.php?pid=168](http://www.health.gov.lk/moh_finale/english/others.php?pid=168)),
- Information Technology and relevant training were provided to the Development Officers (DOs) and Medical Officers (MOs) who are in charge of ISTP at the ET&R Unit,
- Internet facility was provided to the DO and MO who handle the ISTP.
- Microsoft Excel database was developed and updated regularly on ISTP proposal submissions and dispersion of funds.
- Dedicated E-mail and Google sheet were provided for ISTP proposal submission and the link for the Google sheet was shared with the focal points.
- Workshops were done for ISTP focal points in the respective healthcare institutions to improve knowledge, skills, and attitude on proposal development, format filling, training need identification, training need prioritization, development of annual training plan, and on relevant circulars.
- Regular progress reviews were done on implemented interventions and incremental changes to improve the processes.

In phase III, the post-intervention assessment was performed after

implementing the intervention for the identified gaps in phase I, as the methodology used in the Phase I (KII, FGD, Observation Checklist, and Questionnaire).

The research project design was a Quasi-Experimental study (an intervention study). The study was conducted for a period of 12 months from Dec 2017 to Nov 2018. A sample of 55 institutions were taken for the study. A simple random sampling method was used to select 55 institutions for all 3 phases out of total eligible institutions. The questionnaire and the checklist were developed using literature and expert opinion. The questionnaire and the checklist were pre-tested and then modified for final use. The same instruments were used for the pre and post-test. Data collection was done by the principal investigator and the Data was analysed by using the Statistical Package for the Social Sciences (SPSS). Pre and post results of the intervention were compared and described by applying relevant statistical tests. The data was stored securely with the principal investigator. Ethical clearance was obtained from the Ethical Review Committee Post Graduate Institute of Medicine (ERC, PGIM), the University of Colombo, and administrative clearance was taken from Deputy Director General of Education Training and Research Unit (DDG, ET&R). Informed consent was taken from the person's in-charge or representative of the In-service Focal Points at the Institutions and from the involved staff at the ET&R unit.

## **Results**

Key Informant Interviews revealed that proposals are generated at the institutional

level for fund requests and they are received by the ET&R unit. Then the proposals are directed to Director Training through DDG (ET&R). The Director Training will hand over the proposals to the Medical Officer (MO) In-charge for ISTP to evaluate the proposals. In the proposal evaluation Title, Objectives, Justification, Agenda, Resource Personnel, and Budget are taken into consideration. Following this evaluation, budgets of the proposals are evaluated to confirm whether they adhere to the circulars. Approval is granted after these evaluations.

Once the evaluation is completed, depending on the total budget, the proposal will be directed in three different pathways. If the total budget is less than Rs. 200,000 the DDG ET&R will approve it. If the budget is between Rs. 200,000 to Rs. 500,000 the proposal is sent to the Director General of Health Services (DGHS) for approval. If the total budget exceeds Rs. 500,000 the proposal is sent to DGHS and Secretary for approval.

Once the proposal is approved, the allocation letter is signed by the DDG ET&R and sent to the institution. Once the institution received the allocation letter, the funds can be utilized from the training budget. Once the training program is completed, institutions are expected to send the progress report.

## **Key Informant Interviews data on Pre and Post Intervention**

Pre-intervention KII revealed that there were gaps in the processes and the gaps were proposal incompleteness, delays in proposal reception, non-alignment of the title, objectives, and justification of the proposal, non-availability of a focal point for ISTP coordination at the institutional

level, non-availability of the database for ISTP at the ET&R Unit, non-availability of the internet to the ISTP focal point, non-availability of dedicated e-mail for ISTP processes and poor access to ISTP formats, instructions, and circulars. After the intervention same parameters were used to evaluate the intervention and all of the above gaps have improved after the intervention. Director Training, MO, and DO were satisfied with the performance after the intervention compared to pre-intervention.

### Focus Group Discussion Data on Pre & Post Intervention

Pre-intervention FGD with 15 randomly selected focal points revealed that there are gaps in knowledge on proposal development, budgeting the proposal, resource person information, and payments. By FGD assessed the gaps in relation to the availability of focal points at their institutions, availability of basic equipment like the Internet, Computers, Printers, Photocopy Machines, and availability of information regarding ISTP and ISTP formats.

Post-intervention FGD confirmed that there was an improvement in knowledge on proposal development, budgeting, resource person information, and payments after the intervention done. It also revealed that there was an improvement at the institutional level such as availability of focal point for ISTP, availability of basic equipment like the Internet, Computers, Printers, Photocopy Machines, and availability of information regarding ISTP and ISTP formats.

### Observational data at the ET&R unit – Pre & Post Intervention

The observations revealed that the availability of the internet, maintenance of a database, the ability to tracking the application, and financial status and ability to generate data summaries were unsatisfactory in the pre-intervention period. Nevertheless, in the post-intervention phase, these unsatisfactory gaps were improved such as the availability of the internet, maintenance of a database, the ability to track the application and financial status, and the ability to generate data summaries.

### Institutional Description

*Table 1 – Distribution of types of health care institutions selected for the Project*

Type of Health Care Institutions	Frequency	Percent
Base Hospital Type B	11	20.0
Base Hospital Type A	13	23.6
District General Hospital	11	20.0
Provincial General Hospital	1	1.8
Teaching Hospital	11	20.0
Specialized Hospital	1	1.8
NHSL	1	1.8
Others	6	10.9
<b>Total</b>	<b>55</b>	<b>100.0</b>

*Table 2 – Distribution of institutions according to administrative authority*

<b>Type of ministry</b>	<b>Frequency</b>	<b>Percent</b>
Line Ministry	30	54.5
Provincial Ministry	25	45.5
<b>Total</b>	<b>55</b>	<b>100.0</b>

The distribution of research project settings and type of Ministry they belong to are reflected in Tables 1 and 2. The majority (54.5%) of the institutions were at the line Ministry level

#### **Facilities and satisfaction at the institutional level – Pre and Post Intervention**

The comparison of availability and facilities of ISTP Focal Points before and after the intervention, comparison of availability of electronic facilities at ISTP Focal Point before and after the intervention, comparison of Knowledge on ISTP format among ISTP focal points before and after the intervention, and the comparison of the implementation process of ISTPs at institution level before and after the intervention are described in tables 3, 4, 5, and 6.

There was an improvement in availability and facilities in the ISTP focal points in the post-intervention phase at  $p < 0.05$  level, except for the availability of a Multimedia Projector (table 3). The availability of Information and Communication Technology facilities at the focal point has been improved significantly at  $p < 0.001$  level after the intervention (table 4). The knowledge on ISTP formats was improved in the post intervention phase compared to pre intervention significantly at the  $p = 0.005$  level or  $p < 0.005$  level (table 5). The ISTP

implementation processes in all aspects were improved significantly at  $p < 0.05$  level in the post-intervention compared to pre-intervention (table 6). The satisfactory level on selected ET&R services significantly improved at  $p < 0.05$  level in the post-intervention compared to pre-intervention (table 7) and the overall satisfaction of the services provided by the ET&R unit improved at  $p < 0.001$  level (table 8).

The mean time to issue the fund allocation letter from ET&R Unit after submitting the proposal was improved from 21.48 days (pre-intervention) to 4.33 Post Intervention at  $p < 0.001$  level which was the crucial process improvement that has taken place (table 9).





*Table 3– Comparison of availability and facilities of ISTP Focal Points before and after the intervention*

Facilities at Focal Point	Pre (n=55)				Post (n=55)				Significance (z-test, p-value)
	Yes		No		Yes		No		
	freq.	%	freq.	%	freq.	%	freq.	%	
Availability of Focal Point for ISTP at Institution.	46	83.6	9	16.4	54	98.2	1	1.8	Z=2.75, p=0.003
Availability of Specific location for ISTP Focal Point	42	76.4	13	23.6	51	92.7	4	7.3	Z=2.43, p=0.008
Availability of filing cabinets	29	52.7	26	47.3	39	70.9	16	29.1	Z=1.99, p=0.023
Availability of multimedia projector	31	56.4	24	43.6	33	60.0	22	40.0	Z=0.38, p=0.352
Availability of facilities for resource material production (Photocopy or Duplo Machine)	30	54.5	25	45.5	44	80.0	11	20.0	Z=2.96, p=0.007
Availability of Computer at the focal point	31	56.4	24	43.6	41	74.5	14	25.5	Z=2.03, p=0.023
If NO, is there a mechanism to get computer facility	11	20.0	44	80.0	49	89.1	6	10.9	Z=10.11, p<0.001

*Table 4 – Comparison of Availability of electronic facilities at ISTP Focal Point before and after the intervention*

Electronic Facility Availability	Pre (n=55)				Post (n=55)				Significance (z-test, p-value)
	Yes		No		Yes		No		
	freq.	%	freq.	%	freq.	%	freq.	%	
Are Internet facilities available at the focal point	22	40.0	33	60.0	39	70.9	16	29.1	Z=3.43, p<0.001
If NO, is there a mechanism to get internet facilities	19	34.5	36	65.5	49	89.1	6	10.9	Z=7.12, p<0.001
Presence of Email Address for institutional focal point	35	63.6	20	36.4	49	89.1	6	10.9	Z=3.29, p<0.001
Does the focal point In-charge has an Email address	35	63.6	20	36.4	52	94.5	3	5.5	Z=4.30, p<0.001

**Table 5 – Comparison of Knowledge on ISTP format among ISTP focal points before and after the intervention**

Knowledge on ISTP format	Pre (n=55)				Post (n=55)				Significance (z-test, p-value)
	Yes		No		Yes		No		
	freq.	%	freq.	%	freq.	%	freq.	%	
Do you know the new Excel Format for submitting proposals for In-service Training Program?	18	32.7	37	67.3	35	63.6	20	36.4	Z=3.41, p<0.001
If Yes, Do you know how to fill it?	18	32.7	37	67.3	40	72.7	15	27.3	Z=4.59, p<0.001
Do you know the latest payment circular for ISTP?	22	40.0	33	60.0	37	67.3	18	32.7	Z=2.98, p=0.001
Do you know how to fill the payments sections for ISTP proposals according to the circular?	24	43.6	31	56.4	37	67.3	18	32.7	Z=2.57, p=0.005
Do you know how to fill project details component of the ISTP (training objectives)?	20	36.4	35	63.6	38	69.1	17	30.9	Z=3.64, p<0.001

**Table 6 – Comparison of implementation process of ISTPs at institution level before and after the intervention**

Professional Development at Institute level	Pre (n=55)				Post (n=55)				Significance (z-test, p-value)
	Yes		No		Yes		No		
	freq.	%	freq.	%	freq.	%	freq.	%	
Do you have annual human resource development plan?	31	56.4	24	43.6	41	74.5	14	25.5	Z=2.03,p=0.021
Do you have annual training plan in your institution?	37	67.3	18	32.7	47	85.5	8	14.5	Z=2.30,p=0.012
Do you have a mechanism for identifying training needs	40	72.7	15	27.3	50	90.9	5	9.1	Z=2.55, p=0.005
Do you prioritize your training needs at your institution?	36	65.5	19	34.5	47	85.5	8	14.5	Z=2.51,p=0.006
Do you have progress review system / monitoring system for ISTP conduction?	20	36.4	35	63.6	36	65.5	19	34.5	Z=3.19,p<0.001
Do you have financial progress review system / monitoring system for ISTP?	16	29.1	39	70.9	32	58.2	23	41.8	Z=3.22, p<0.001
Do you get ISTP funds in time? / timely reception of funding from ET&R Unit	19	34.5	36	65.5	34	61.8	21	38.2	Z=2.97, p=0.001

Table 7 – Comparison of level of satisfaction of focal points in selected areas about the ET&R services before and after the intervention

Satisfaction about ET&R Service	Pre (n=55)			Post (n=55)			Significance
	Freq.	%	Cum.	Freq.	%	Cum.	
<b>Information regarding ISTP from ET&amp;R</b>							
Very bad	2	3.6	3.6	0	0.0	2	
Bad	16	29.1	32.7	6	10.9	16	
Satisfactory	23	41.8	74.5	21	38.2	23	
Good	11	20.0	94.5	20	36.4	11	
Very good	3	5.5	100.0	8	14.5	3	
Total	55	100.0		55	100.0	55	
<b>Mean ± SD</b>	<b>2.95±0.93</b>			<b>3.55±0.88</b>			<b>Z=3.14,p=0.002*</b>
<b>Correspondence on ISTP from ET&amp;R</b>							
Very bad	3	5.5	5.5	0	0.0	0.0	
Bad	15	27.3	32.8	8	14.5	14.5	
Satisfactory	21	38.2	71.0	17	30.9	45.5	
Good	12	21.8	92.8	23	41.8	87.3	
Very good	4	7.3	100.0	7	12.7	100.0	
Total	55	100.0		55	100.0		
<b>Mean ± SD</b>	<b>2.98±1.01</b>			<b>3.53±0.90</b>			<b>Z=2.71,p=0.007*</b>
<b>Funds Allocation from ET&amp;R</b>							
Very bad	3	5.5	5.5	3	5.5	5.5	
Bad	17	30.9	36.4	5	9.1	14.6	
Satisfactory	18	32.7	69.1	21	38.2	52.8	
Good	14	25.5	94.5	16	29.1	81.9	
Very good	3	5.5	100.0	10	18.2	100.0	
Total	55	100.0		55	100.0		
<b>Mean ± SD</b>	<b>2.95 ± 1.01</b>			<b>3.45 ± 1.07</b>			<b>Z=2.23,p=0.026*</b>

\*Wilcoxon Signed Ranks Test was applied for significance test.

Table 8 – Comparison of overall satisfaction level of the focal points about the ET&R services before and after the intervention

Satisfaction about ET&R Service	Pre (n=55)			Post (n=55)			Significance
	freq.	%	Cum.	freq.	%	Cum.	
<b>Over all service from ET&amp;R with regards to ISTP</b>							
Very bad	1	1.8	1.8	0	0.0	0.0	
Bad	21	38.2	40.0	7	12.7	12.7	
Satisfactory	15	27.3	67.2	13	23.6	36.3	
Good	15	27.3	94.5	18	32.7	69.1	
Very good	3	5.5	100.0	17	30.9	100.0	
Total	55	100.0		55	100.0		
<b>Mean±SD</b>	<b>2.96±0.98</b>			<b>3.82±1.02</b>			<b>Z=3.67,p&lt;0.001*</b>

\*Wilcoxon Signed Ranks Test was applied for significance test.

Table 9 – Comparison of the Processing time of ISTP proposal before and after the intervention

Year	N	Mean Time in Days	Standard Deviation (SD)	Median Time in Days	Significance (t-test and p-value)
<b>2017</b>	<b>60</b>	21.48	37.458	4.836	t =3.63, p<0.001*
<b>2018</b>	<b>64</b>	4.33	5.139	.642	

\*Wilcoxon Signed Ranks Test was applied for significance test.

## DISCUSSION

The number of focal points significantly improved at  $p = 0.003$  level, and improvement in a designated area for ISTP also improved at  $p = 0.008$  level, and the facilities like Computers, Photocopying and Cabinet showed significant improvement at  $p < 0.05$  significance level and the availability of the internet facilities and availability of E-mail address for the focal point or institution improved at  $p < 0.001$  significance level, which could have been as a result of educating the focal points and the heads of the institutions regarding these requirements. Awareness on the latest paying circulars, how to fill the project component in the format, and how to fill the payment component have been significantly improved after the intervention and availability of Human Resource development plan, availability of annual training plan, training need identification, and prioritization of the training needs and conduction of progress reviews and monitoring of ISTP, financial progress at the institutional level and timely reception of funds has improved at

## References

1. Ministry of Health Nutrition and Indigenous Medicine. Annual Health Bulletin 2015. Ministry of health Nutrition and Indigenous Medicine, Sri Lanka; 2017.
2. CPDUK. What is CPD - The CPD Certification Service - Continuing Professional Development Accreditation [Internet]. 2015 [cited 2019 Mar 6]. Available from: <https://cpduk.co.uk/explained>
3. Fariña D. La capacitación en terreno como estrategia para la mejora de la calidad de la atención de la salud. Arch Argent Pediatr [Internet]. 2012 Feb 1 [cited 2019 Mar 6];110(1):9–18. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/22307417>
4. Senarath U, Fernando DN, Rodrigo I. Effect of Training for Care Providers on Practice of Essential Newborn Care in Hospitals in Sri Lanka. J Obstet Gynecol Neonatal Nurs [Internet]. 2007 Nov [cited 2019 Mar 6];36(6):531–41. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/17973696>

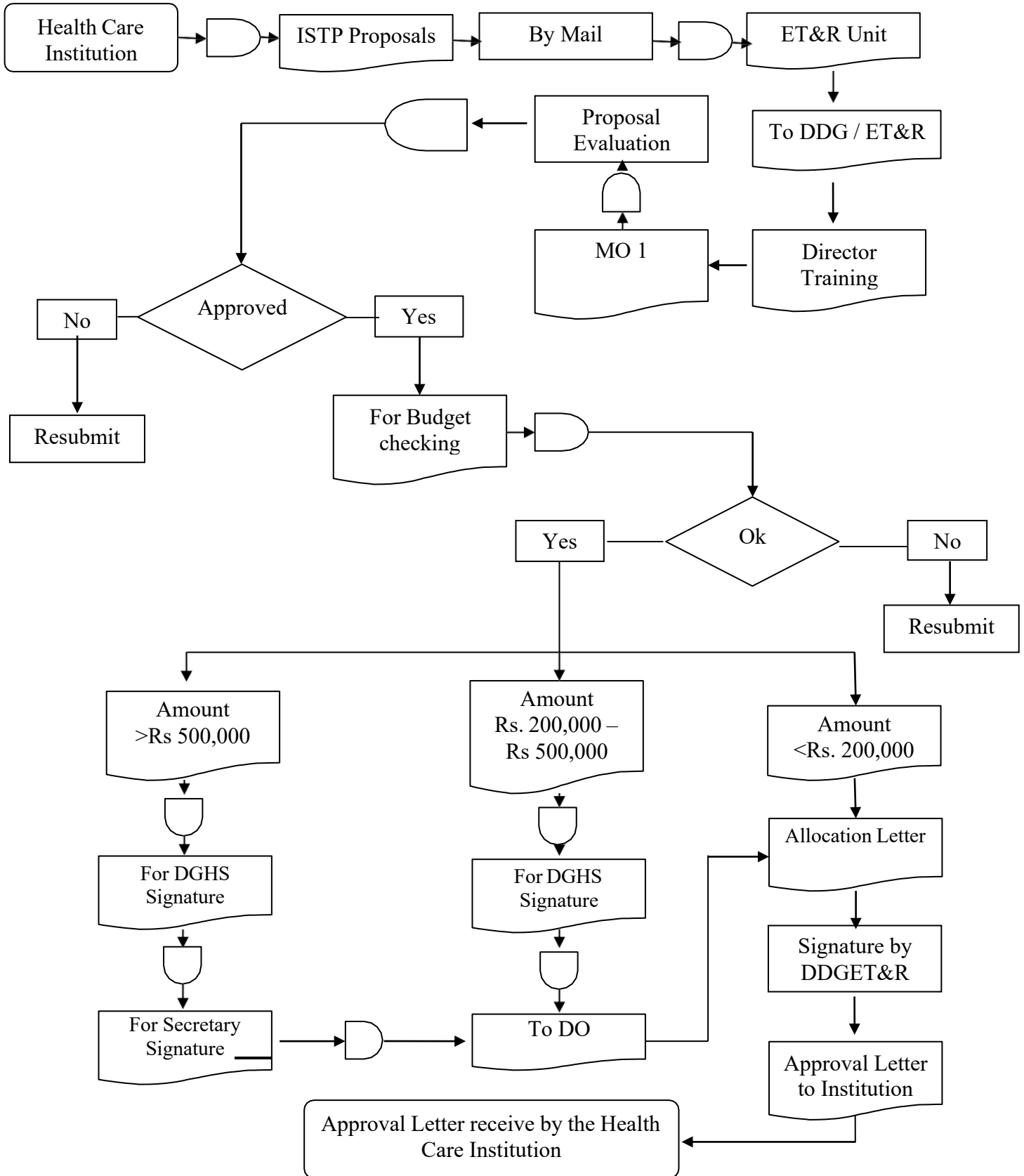
a significant level. The interventions were conducting training programs, workshops, and one-to-one education, and web-based instructions and formats were made available to freely access, and regular monitoring and evaluation of the process were done. These collective interventions may have contributed towards the significant improvements.

## Conclusion

The multiple approaches made in improving the processes in this research project have contributed to improving the overall satisfaction of the ET&R services that are provided towards the focal points, and this research project also reduced the lead time significantly from 21.48 days to 4.33 days at a  $p < 0.001$  level. The overall qualitative and quantitative results showed that there were significant improvements, and it can be concluded that the interventions carried out are effective. In this research project, the significant process improvement that has been achieved by several methods can be applied for similar kind of projects.

5. Claire Vanner. What is Process Improvement? Methodologies to Help Your Business [Internet]. 2020 [cited 2021 Jun 8]. Available from: <https://www.bizagi.com/en/blog/what-is-process-improvement-methodologies-to-help-your-business>
6. Business Dictionary. What is risk? definition and meaning [Internet]. Business Dictionary. 2018 [cited 2019 Mar 10]. Available from: <http://www.businessdictionary.com/definition/process-improvement.html>
7. Mazzocato P, Savage C, Brommels M, Aronsson H, Thor J. Lean thinking in healthcare: a realist review of the literature. *BMJ Qual Saf* [Internet]. 2010 Oct 1 [cited 2019 Jun 28];19(5):376–82. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/20724397>

**Annexure I – Process Map**





**ISSN: 1391-2909**



THE SRI LANKA JOURNAL OF  
**MEDICAL**  
**ADMINISTRATION**

OFFICIAL PUBLICATION OF  
THE COLLEGE OF MEDICAL ADMINISTRATORS OF SRI LANKA

ISSN: 1391-2909

VOLUME 24, ISSUE I  
SEPTEMBER 2023



---

# **The Sri Lanka Journal of Medical Administration**

---

**'Rising through Challenges: Leading Towards Health System Resilience'**

**Volume 24**

**2023**

**Official Publication of the College of Medical Administrators of  
Sri Lanka**

## **Editor**

Dr Priyantha Athapattu

## **Editorial Board**

Dr SAP Gnanissara

Dr Sarath Samarage

Dr Neelamani Rajapaksha Hewageegana

Dr Sudath Dharmaratne

Dr Alan Ludowyke

Dr Priyantha Karunaratne

## **Secretariat**

Office of the College of Medical Administrators of Sri Lanka

Directorate of Health Care Quality and Safety

Castle Street Hospital for Women

Castle Street, Colombo 08.

[www.cmasl.lk](http://www.cmasl.lk)

Official Publication of the College of Medical Administrators of Sri Lanka

ISSN : 1391-2909



---

## Our Objectives

- To guide the health development in Sri Lanka.
- To assist in the implementation of national health policy.
- To promote postgraduate studies in the field of medical administration.
- To undertake health system research in the field of medical administration.
- To promote and foster professional advancement of Medical Administrators.
- To regularly review the status of Medical Administration in the country and analyse problems in the field.
- To guide the Ministry of Health and private sector on human resources development and resources mobilization in the field.
- To foster fellowship among the professionals engaged in the field of Medical Administration.
- To publish a journal of professional Medical Administration.

CONTENTS		Page
1	<b>Editorial - Strengthening Health Resilience through Medical Audits: A Pathway to Effective Medical Administration</b> <i>Athapatu P.L</i>	6
2	<b>Presidential Message</b> <i>Panapitiya Lal</i>	8
3	<b>Towards Health System Resilience beyond Boundaries</b> <i>Panapitiya L<sup>1</sup>, Samarakoon S<sup>2</sup>, Ranasinghe G S P<sup>3</sup>, Shiraj M<sup>4</sup>, WijewikramaA<sup>5</sup>, Samararathna K<sup>6</sup>, Dr Rahulan K<sup>7</sup>, Thantreege S<sup>8</sup>, Singhaprathapa K<sup>9</sup>, Gandeepan T<sup>10</sup></i>	10
4	<b>Training needs analysis for oxygen management and Emergency care</b> <i>Samarakoon M A S C<sup>1</sup>, Wanniachchi M<sup>2</sup>, Samarajeewa G<sup>3</sup>, Niyas R<sup>4</sup>, Ranathunga D<sup>5</sup></i>	22
5	<b>Distribution and Performance Evaluation of Radiology and Imaging Services in Line Ministry Hospitals in Sri Lanka</b> <i>Rathnakeerthi A<sup>1</sup>, Dolamulla S<sup>2</sup>, Panapitiya L<sup>3</sup></i>	30
6	<b>Maximum utilization of work capacity subject clerks through workload assessment and employee performance evaluation -A case study from Family Health Bureau</b> <i>Rajapaksha D.M.P.</i>	38
7	<b>Experience at Manor Hospital of Walsall Healthcare NHS Trust, United Kingdom on the application of simple tool of National Early Warning Score to reduce the Intensive Care Unit admissions.</b> <i>Pathirage I.D</i>	47
8	<b>Perspectives of Patient Engagement in Base Hospital Mirigama, Sri Lanka</b> <i>Malalasekara L.I<sup>1</sup>, Wijemanne W.M.S.U<sup>2</sup>, Mallawarachchi S.M.N<sup>3</sup>.</i>	53
9	<b>Feasibility of Implementing Cluster Laboratory System in Regional Directorate of Health Services, Gampaha district, Sri Lanka</b> <i>Jayasundara K.M.P.D<sup>1</sup>, Seneviratne Y.G.A.C.<sup>2</sup>, Dharmaratne S.K.<sup>3</sup></i>	58
10	<b>Complaint Book Grievance Management Process at District General Hospital Avissawella</b> <i>Sandanayake AP<sup>1</sup> Wellala E<sup>2</sup></i>	63
11	<b>Responsiveness in healthcare at Lanka Hospitals, Colombo: A review</b> <i>Senevirathne Y.G.A.C<sup>1</sup> Jayasundara K.M.P.D.<sup>2</sup>, Dharmarathne S.K<sup>3</sup></i>	71
12	<b>A review on the service utilization of the National Poisons Information Centre</b> <i>Attanayake H<sup>1</sup>, Wickremasinghe K<sup>2</sup></i>	74
13	<b>Feasibility Assessment of Revised Diagnosis Card to meet current issues relating to Patient Follow up</b> <i>Wijemanne W.M.U.S<sup>1</sup>, Wickremasinghe S.C<sup>1</sup></i>	84
14	<b>Novel Digital adherence Technologies for the Tuberculosis Treatment</b> <i>Ranawaka N<sup>1*</sup>, Nandasena S<sup>2</sup>, De Alwis S<sup>3</sup></i>	92

---

<b>15</b>	<b>Selected factors linked with treatment compliance among patients attending mental health clinic in National Hospital Kandy Sri Lanka</b> <i>Singhaprathapa SWMKK<sup>1</sup></i>	<b>95</b>
<b>15</b>	<b>Development of an Area Specific Monthly Dengue Case Target Calculator for Dengue Control in Sri Lanka</b> <i>Wijethunga WMTS<sup>1</sup> Kodituwakku KALC<sup>2</sup>, Francis GS<sup>1</sup></i>	<b>104</b>
<b>16</b>	<b>Assessment of Nursing Performance Management Practices in the National Hospital of Sri Lanka</b> <i>Dr Wijekoon W.M.C.R.<sup>1</sup>, Dr Wickremasinghe W.K.<sup>2</sup></i>	<b>113</b>
<b>17</b>	<b>Factors affecting occupational radiation safety among selected categories of staff of the National Hospital of Sri Lanka, Colombo</b> <i>Arachchi KANLK<sup>1</sup>, Dharmagunawardene D<sup>2</sup></i>	<b>122</b>
<b>18</b>	<b>Process improvement of fund allocations for in-service training programs at the Education, Training and Research Unit Ministry of Health Sri Lanka</b> <i>*G.S.P. Ranasinghe<sup>1</sup>, S.B. De Alwis<sup>2</sup>, P.V.D.S. Dharmagunawardene<sup>3</sup></i>	<b>130</b>

# **Strengthening Health Resilience through Medical Audits: A Pathway to Effective Medical Administration**

**Dr. Priyantha Athapattu, Editor, College of Medical Administrators of Sri Lanka**

In the face of ever-evolving healthcare challenges, the need for resilient health systems has become increasingly evident. As medical administrators, we have a crucial role to play in ensuring the preparedness and effectiveness of our healthcare organizations. One powerful tool at our disposal is the use of medical audits to identify areas for improvement, enhance quality, and ultimately strengthen health resilience. In this editorial, we delve into the significance of medical audits in fortifying our healthcare systems and highlight the transformative potential they hold for medical administration.

Medical audits serve as a cornerstone for building preparedness and response capabilities within healthcare organizations. By systematically reviewing processes, procedures, and outcomes, audits provide invaluable insights into the strengths and weaknesses of our systems. They help us assess the effectiveness of emergency response plans, identify gaps, and enhance coordination and communication. With the knowledge gained from audits, we can

proactively adapt our strategies to address emerging challenges, such as pandemics, natural disasters, or public health crises.

Quality improvement and patient safety are integral to resilient healthcare systems. Medical audits play a pivotal role in this regard by identifying errors, adverse events, and near misses. By uncovering these critical incidents, audits enable us to implement targeted interventions, improve clinical practices, and reduce patient harm. Through audits, we can continuously monitor and enhance the quality of healthcare services, ensuring that patient safety remains at the forefront of our efforts.

Medical audits shed light on systemic issues and inefficiencies that may hinder the smooth functioning of healthcare organizations. By analysing data and processes, audits help us identify bottlenecks in resource allocation, workflow procedures, or infrastructure. Armed with these insights, we can make evidence-based recommendations for improvement, leading to streamlined operations and enhanced



efficiency. Addressing these systemic issues not only strengthens the resilience of our healthcare systems but also improves the overall patient experience and outcomes.

As medical administrators, we recognize the importance of continuous professional development and training for our healthcare workforce. Medical audits play a vital role in this area by identifying knowledge gaps and areas for skill enhancement. By incorporating audit findings into training programs, we can foster a culture of learning, reflective practice, and evidence-based decision-making among healthcare professionals. This empowers our workforce to adapt to changing circumstances, embrace innovation, and deliver the highest quality care.

While the benefits of medical audits are undeniable, it is essential to acknowledge and address the challenges associated with their implementation. Resource constraints, data unavailability, and resistance to change are some of the hurdles we may encounter. However, by investing in capacity building, engaging stakeholders, and leveraging technology, we can overcome these challenges and maximize the impact of medical audits. Additionally, we must remain steadfast in upholding ethical

considerations, ensuring patient privacy, informed consent, and the confidentiality of data throughout the auditing process.

In the pursuit of resilient health systems, medical audits stand as a powerful tool for medical administrators. By harnessing the insights derived from audits, we can fortify our healthcare organizations, enhance preparedness, drive quality improvement, and promote patient safety. It is imperative that we embrace medical audits as an integral part of our medical administration practice, investing in their implementation, and utilizing their findings to effect positive change. Let us seize this opportunity to strengthen health resilience, ensuring that our healthcare systems are well-equipped to face the challenges of today and tomorrow.

## PRESIDENTIAL MESSAGE

### **Rising through Challenges; Leading towards Health System Resilience ('Beyond Boundaries')**

Dr. Lal Panapitiya

In the contemporary world, global health crises and challenges demand our utmost attention, it is crucial to explore the resilience of health systems beyond the boundaries. Global health systems encountered unexpected issues and challenges that have tested their strength and adaptability. The COVID-19 pandemic, in particular, has exposed the vulnerabilities of health systems and has highlighted the need for resilience that transcends geographical boundaries.

The healthcare system in Sri Lanka which has achieved numerous milestones with excellent health indicators, demonstrated its ability to withstand and manage the COVID pandemic successfully while maintaining its routine healthcare services both preventive and curative services. This resilience was evident not only during the crisis of the COVID pandemic

but also in the face of other recent challenges such as civil war, Tsunami, etc.

This was made possible due to the presence of a well-established healthcare system that offers specialized and doorstep services to individuals by healthcare professionals. These accomplishments, which include effectively managing the COVID pandemic with cost-effective services, underscore the significance of Medical Administration and leadership. Since, the healthcare domain shines as a dynamic arena, brimming with growth potential and a host of not only complex but constantly changing intricate challenges, it is the medical administrator's duty to adapt, innovate, and lead in this dynamic environment.

While appreciating the exceptional efforts of our past leaders *to navigated through troubled waters, developing health service to such standards, and establishing this esteemed college*, it's incumbent upon us today to confront impediments to *rise through challenges towards health system resilience, beyond boundaries*".

#### **College of Medical Administrators of Sri Lanka (CMASL)**

The college was formed as an Association of Medical Administrators (AMA) in 1974 and converted to the College of Medical Administrators of Sri Lanka (CMASL) in 1992 with 46 visionary leaders.

Over the years, our college has achieved the enrollment of the first batches of MSc and MD students in 1994 and 2004, respectively. Since then, we have witnessed the successful completion of 21 batches of MSc and 13 batches of MD, resulting in the emergence of 364 MSc

PG holders and 58 Board Certified Consultants in Medical Administration by year 2023 who contribute dedicated service for the betterment of the health service of the country.

#### **The country's Development and System Resilience**

As we contemplate the state of any nation, it is essential to recognize that the country's development rests on five key pillars: Health, Defense, Economy, Education, and the Judiciary system. These pillars serve as the bedrock of a nation's advancement and any disruption

in one can undermine the entire framework.

We have already witnessed the repercussions of disturbances in three of these pillars. The Defense Sector faced severe challenges due to 30 years of war and the Easter Attacks, hindering the country's development. The emergence and rapid spread of COVID-19 badly affected not only the health of citizens but also the social, and economic aspects and development of the country. Similarly, the nation witnesses the economic crisis and its outcome and impact on the health and well-being of citizens. This illustrates the interconnectedness and interdependence of these pillars, highlighting the critical importance of establishing resilient systems. Therefore, it is the duty of medical administrators to cultivate, safeguard, and sustain the resilience of all these aspects effectively.

### **Attributes of Health System Resilience**

Resilience is defined as the preparedness of

### **Building a Resilient Health System**

To build health system resilience, strategies have been developed based on the health system building blocks. These strategies include,

- Improved service delivery (Safe, Quality, Productive, Customer Focused) through innovative system development based on learning through past experience.
- Improved access to essential resources and services; medicines, vaccines, and technologies
- Commitment to health equity and social justice
- Community Empowerment and engagement
- Strengthened health workforce.
- Health information systems with improved surveillance systems
- Sustainable health system financing
- Empowered leadership and Improved Governance

a system and capacity to respond to a shock which is any known or unknown, sudden, and extreme changes in the environment. organization which impacts a system. The type, severity, and duration of the shock determine its effect on system performance and level of impact. Attributes of Health System Resilience are;

- ✧ Preparedness to absorb and adapt to shocks.
- ✧ Effective response to challenges and changes at different levels
- ✧ Adaptation and transformation through learning from past experiences
- ✧ Continuously providing critical functions and essential services
- ✧ A focus on delivering high-quality care services under varying conditions.

Resilience means not just withstanding shocks but also adapting and even transforming to a better state than earlier in response to changes.

Essential to a resilient healthcare system is the building of essential resources. Medical Technology Assessment together with resource mapping guides the way to the proper distribution and utilization of resources and services efficiently. Innovative system development based on learning through past experience for Safe, Quality, Productive, customer-focused service delivery is a must. A motivated and skilled health workforce is the cornerstone of success, not only during crises but also in preparedness and management. Accurate and timely information systems, integrated with alert mechanisms, are vital for early detection of emerging health threats.

Ensuring sustainable financing mechanisms, including resource pooling and alternative sources such as social health insurance and earmarked tax

system need to be explored. In addition, new avenues for income generation mechanisms, such as manufacturing medicines for exports, medical tourism, and education tourism should be considered. Our efforts must prioritize health equity and social justice, empowering and engaging communities in their health needs is an essential path for resilience. Empowered visionary leadership and improved governance underpin the success of all these strategies.

The country has a rich history of resilience and boundless experience in health system resilience, which is very much limited in the region and other parts of the world. The health system faced challenges, survived, and thrived in the past. Hence, health managers have to shift their focus beyond planning and implementing interventions to ensure that the healthcare system exhibits resilience when facing unforeseen circumstances.

Embracing new perspectives, such as International Collaboration (Breaking down silos, thinking, and collaborating across units, sectors, and ministries), Beyond Boundaries (collaboratively managing innovative alternatives and

expanding into the international arena), Teamwork (prioritizing team performance over individual achievements) will not elevate our profession within the healthcare sector but also extends its impact beyond these boundaries.

Presently, we are confronted with formidable challenges in delivering healthcare services, including the provision of essential medicine, laboratory services, brain drain of the health workforce, and financial hardship. On top of that, the risk of CBRNE (Chemical, Biological, Radiological, Nuclear, and yield Explosives) hazard is a major concern in the global context. Natural disasters build on additional risk to the health sector. These limitless obstacles hinder us from moving forward in our motherland as a whole.

As health professionals of the current era, we are at a crucial juncture where we need to make decisions like, “Now OR Never” considering all the above obstacles. *“Again, we struggled, we are surviving now, and we will definitely thrive soon as a country, that’s how the history says”*. But, we should not overlook the opportunity to sustain this time, for the betterment of the future generation.

***“The greatest threat to our society is the belief that someone else will save our country”.***

It is high time to call upon all the sectors of the nation, beyond the boundaries towards the common goal, **“One Country, One Health”** for the sake of our motherland and citizens, during this challenging period. Please remember that past success is the future killer. Think differently, act differently, and achieve differently since crisis, always a good opportunity for a good leader to create new future.



THE SRI LANKA JOURNAL OF  
**MEDICAL**  
**ADMINISTRATION**

OFFICIAL PUBLICATION OF  
THE COLLEGE OF MEDICAL ADMINISTRATORS OF SRI LANKA

ISSN: 1391-2909

VOLUME 24, ISSUE I  
SEPTEMBER 2023



---

# **The Sri Lanka Journal of Medical Administration**

---

**'Rising through Challenges: Leading Towards Health System Resilience'**

**Volume 24**

**2023**

**Official Publication of the College of Medical Administrators of  
Sri Lanka**

## **Editor**

Dr Priyantha Athapattu

## **Editorial Board**

Dr SAP Gnanissara

Dr Sarath Samarage

Dr Neelamani Rajapaksha Hewageegana

Dr Sudath Dharmaratne

Dr Alan Ludowyke

Dr Priyantha Karunaratne

## **Secretariat**

Office of the College of Medical Administrators of Sri Lanka

Directorate of Health Care Quality and Safety

Castle Street Hospital for Women

Castle Street, Colombo 08.

[www.cmasl.lk](http://www.cmasl.lk)

Official Publication of the College of Medical Administrators of Sri Lanka

ISSN : 1391-2909



---

## Our Objectives

- To guide the health development in Sri Lanka.
- To assist in the implementation of national health policy.
- To promote postgraduate studies in the field of medical administration.
- To undertake health system research in the field of medical administration.
- To promote and foster professional advancement of Medical Administrators.
- To regularly review the status of Medical Administration in the country and analyse problems in the field.
- To guide the Ministry of Health and private sector on human resources development and resources mobilization in the field.
- To foster fellowship among the professionals engaged in the field of Medical Administration.
- To publish a journal of professional Medical Administration.



CONTENTS		Page
1	<b>Editorial - Strengthening Health Resilience through Medical Audits: A Pathway to Effective Medical Administration</b> <i>Athapatu P.L</i>	6
2	<b>Presidential Message</b> <i>Panapitiya Lal</i>	8
3	<b>Towards Health System Resilience beyond Boundaries</b> <i>Panapitiya L<sup>1</sup>, Samarakoon S<sup>2</sup>, Ranasinghe G S P<sup>3</sup>, Shiraj M<sup>4</sup>, Wijewikrama A<sup>5</sup>, Samarathna K<sup>6</sup>, Dr Rahulan K<sup>7</sup>, Thanreege S<sup>8</sup>, Singhprathapa K<sup>9</sup>, Gandeepan T<sup>10</sup></i>	10
4	<b>Training needs analysis for oxygen management and Emergency care</b> <i>Samarakoon M A S C<sup>1</sup>, Wanniachchi M<sup>2</sup>, Samarajeewa G<sup>3</sup>, Niyas R<sup>4</sup>, Ranathunga D<sup>5</sup></i>	22
5	<b>Distribution and Performance Evaluation of Radiology and Imaging Services in Line Ministry Hospitals in Sri Lanka</b> <i>Rathnakeerthi A<sup>1</sup>, Dolamulla S<sup>2</sup>, Panapitiya L<sup>3</sup></i>	30
6	<b>Maximum utilization of work capacity subject clerks through workload assessment and employee performance evaluation -A case study from Family Health Bureau</b> <i>Rajapaksha D.M.P.</i>	38
7	<b>Experience at Manor Hospital of Walsall Healthcare NHS Trust, United Kingdom on the application of simple tool of National Early Warning Score to reduce the Intensive Care Unit admissions.</b> <i>Pathirage I.D</i>	47
8	<b>Perspectives of Patient Engagement in Base Hospital Mirigama, Sri Lanka</b> <i>Malalasekara L.I<sup>1</sup>, Wijemanne W.M.S.U<sup>2</sup>, Mallawarachchi S.M.N<sup>3</sup>.</i>	53
9	<b>Feasibility of Implementing Cluster Laboratory System in Regional Directorate of Health Services, Gampaha district, Sri Lanka</b> <i>Jayasundara K.M.P.D<sup>1</sup>, Seneviratne Y.G.A.C.<sup>2</sup>, Dharmaratne S.K.<sup>3</sup></i>	58
10	<b>Complaint Book Grievance Management Process at District General Hospital Avissawella</b> <i>Sandanayake AP<sup>1</sup> Wellala E<sup>2</sup></i>	63
11	<b>Responsiveness in healthcare at Lanka Hospitals, Colombo: A review</b> <i>Senevirathne Y.G.A.C<sup>1</sup> Jayasundara K.M.P.D.<sup>2</sup>, Dharmarathne S.K<sup>3</sup></i>	71
12	<b>A review on the service utilization of the National Poisons Information Centre</b> <i>Attanayake H<sup>1</sup>, Wickremasinghe K<sup>2</sup></i>	74
13	<b>Feasibility Assessment of Revised Diagnosis Card to meet current issues relating to Patient Follow up</b> <i>Wijemanne W.M.U.S<sup>1</sup>, Wickremasinghe S.C<sup>1</sup></i>	84
14	<b>Novel Digital adherence Technologies for the Tuberculosis Treatment</b> <i>Ranawaka N<sup>1*</sup>, Nandasena S<sup>2</sup>, De Alwis S<sup>3</sup></i>	92

---

<b>15</b>	<b>Selected factors linked with treatment compliance among patients attending mental health clinic in National Hospital Kandy Sri Lanka</b> <i>Singhaprathapa SWMKK<sup>1</sup></i>	95
<b>15</b>	<b>Development of an Area Specific Monthly Dengue Case Target Calculator for Dengue Control in Sri Lanka</b> <i>Wijethunga WMTS<sup>1</sup> Kodituwakku KALC<sup>2</sup>, Francis GS<sup>1</sup></i>	104
<b>16</b>	<b>Assessment of Nursing Performance Management Practices in the National Hospital of Sri Lanka</b> <i>Dr Wijekoon W.M.C.R.<sup>1</sup>, Dr Wickremasinghe W.K.<sup>2</sup></i>	113
<b>17</b>	<b>Factors affecting occupational radiation safety among selected categories of staff of the National Hospital of Sri Lanka, Colombo</b> <i>Arachchi KANLK<sup>1</sup>, Dharmagunawardene D<sup>2</sup></i>	122
<b>18</b>	<b>Process improvement of fund allocations for in-service training programs at the Education, Training and Research Unit Ministry of Health Sri Lanka</b> <i>*G.S.P. Ranasinghe<sup>1</sup>, S.B. De Alwis<sup>2</sup>, P.V.D.S. Dharmagunawardene<sup>3</sup></i>	130

# **Strengthening Health Resilience through Medical Audits: A Pathway to Effective Medical Administration**

**Dr. Priyantha Athapattu, Editor, College of Medical Administrators of Sri Lanka**

In the face of ever-evolving healthcare challenges, the need for resilient health systems has become increasingly evident. As medical administrators, we have a crucial role to play in ensuring the preparedness and effectiveness of our healthcare organizations. One powerful tool at our disposal is the use of medical audits to identify areas for improvement, enhance quality, and ultimately strengthen health resilience. In this editorial, we delve into the significance of medical audits in fortifying our healthcare systems and highlight the transformative potential they hold for medical administration.

Medical audits serve as a cornerstone for building preparedness and response capabilities within healthcare organizations. By systematically reviewing processes, procedures, and outcomes, audits provide invaluable insights into the strengths and weaknesses of our systems. They help us assess the effectiveness of emergency response plans, identify gaps, and enhance coordination and communication. With the knowledge gained from audits, we can

proactively adapt our strategies to address emerging challenges, such as pandemics, natural disasters, or public health crises.

Quality improvement and patient safety are integral to resilient healthcare systems. Medical audits play a pivotal role in this regard by identifying errors, adverse events, and near misses. By uncovering these critical incidents, audits enable us to implement targeted interventions, improve clinical practices, and reduce patient harm. Through audits, we can continuously monitor and enhance the quality of healthcare services, ensuring that patient safety remains at the forefront of our efforts.

Medical audits shed light on systemic issues and inefficiencies that may hinder the smooth functioning of healthcare organizations. By analysing data and processes, audits help us identify bottlenecks in resource allocation, workflow procedures, or infrastructure. Armed with these insights, we can make evidence-based recommendations for improvement, leading to streamlined operations and enhanced

efficiency. Addressing these systemic issues not only strengthens the resilience of our healthcare systems but also improves the overall patient experience and outcomes.

As medical administrators, we recognize the importance of continuous professional development and training for our healthcare workforce. Medical audits play a vital role in this area by identifying knowledge gaps and areas for skill enhancement. By incorporating audit findings into training programs, we can foster a culture of learning, reflective practice, and evidence-based decision-making among healthcare professionals. This empowers our workforce to adapt to changing circumstances, embrace innovation, and deliver the highest quality care.

While the benefits of medical audits are undeniable, it is essential to acknowledge and address the challenges associated with their implementation. Resource constraints, data unavailability, and resistance to change are some of the hurdles we may encounter. However, by investing in capacity building, engaging stakeholders, and leveraging technology, we can overcome these challenges and maximize the impact of medical audits. Additionally, we must remain steadfast in upholding ethical

considerations, ensuring patient privacy, informed consent, and the confidentiality of data throughout the auditing process.

In the pursuit of resilient health systems, medical audits stand as a powerful tool for medical administrators. By harnessing the insights derived from audits, we can fortify our healthcare organizations, enhance preparedness, drive quality improvement, and promote patient safety. It is imperative that we embrace medical audits as an integral part of our medical administration practice, investing in their implementation, and utilizing their findings to effect positive change. Let us seize this opportunity to strengthen health resilience, ensuring that our healthcare systems are well-equipped to face the challenges of today and tomorrow.

## PRESIDENTIAL MESSAGE

### **Rising through Challenges; Leading towards Health System Resilience ('Beyond Boundaries')**

Dr. Lal Panapitiya

In the contemporary world, global health crises and challenges demand our utmost attention, it is crucial to explore the resilience of health systems beyond the boundaries. Global health systems encountered unexpected issues and challenges that have tested their strength and adaptability. The COVID-19 pandemic, in particular, has exposed the vulnerabilities of health systems and has highlighted the need for resilience that transcends geographical boundaries.

The healthcare system in Sri Lanka which has achieved numerous milestones with excellent health indicators, demonstrated its ability to withstand and manage the COVID pandemic successfully while maintaining its routine healthcare services both preventive and curative services. This resilience was evident not only during the crisis of the COVID pandemic

but also in the face of other recent challenges such as civil war, Tsunami, etc.

This was made possible due to the presence of a well-established healthcare system that offers specialized and doorstep services to individuals by healthcare professionals. These accomplishments, which include effectively managing the COVID pandemic with cost-effective services, underscore the significance of Medical Administration and leadership. Since, the healthcare domain shines as a dynamic arena, brimming with growth potential and a host of not only complex but constantly changing intricate challenges, it is the medical administrator's duty to adapt, innovate, and lead in this dynamic environment.

While appreciating the exceptional efforts of our past leaders *to navigated through troubled waters, developing health service to such standards, and establishing this esteemed college*, it's incumbent upon us today to confront impediments to *rise through challenges towards health system resilience, beyond boundaries*".

#### **College of Medical Administrators of Sri Lanka (CMASL)**

The college was formed as an Association of Medical Administrators (AMA) in 1974 and converted to the College of Medical Administrators of Sri Lanka (CMASL) in 1992 with 46 visionary leaders.

Over the years, our college has achieved the enrollment of the first batches of MSc and MD students in 1994 and 2004, respectively. Since then, we have witnessed the successful completion of 21 batches of MSc and 13 batches of MD, resulting in the emergence of 364 MSc

PG holders and 58 Board Certified Consultants in Medical Administration by year 2023 who contribute dedicated service for the betterment of the health service of the country.

#### **The country's Development and System Resilience**

As we contemplate the state of any nation, it is essential to recognize that the country's development rests on five key pillars: Health, Defense, Economy, Education, and the Judiciary system. These pillars serve as the bedrock of a nation's advancement and any disruption

in one can undermine the entire framework.

We have already witnessed the repercussions of disturbances in three of these pillars. The Defense Sector faced severe challenges due to 30 years of war and the Easter Attacks, hindering the country's development. The emergence and rapid spread of COVID-19 badly affected not only the health of citizens but also the social, and economic aspects and development of the country. Similarly, the nation witnesses the economic crisis and its outcome and impact on the health and well-being of citizens. This illustrates the interconnectedness and interdependence of these pillars, highlighting the critical importance of establishing resilient systems. Therefore, it is the duty of medical administrators to cultivate, safeguard, and sustain the resilience of all these aspects effectively.

### **Attributes of Health System Resilience**

Resilience is defined as the preparedness of

### **Building a Resilient Health System**

To build health system resilience, strategies have been developed based on the health system building blocks. These strategies include,

- Improved service delivery (Safe, Quality, Productive, Customer Focused) through innovative system development based on learning through past experience.
- Improved access to essential resources and services; medicines, vaccines, and technologies
- Commitment to health equity and social justice
- Community Empowerment and engagement
- Strengthened health workforce.
- Health information systems with improved surveillance systems
- Sustainable health system financing
- Empowered leadership and Improved Governance

a system and capacity to respond to a shock which is any known or unknown, sudden, and extreme changes in the environment. organization which impacts a system. The type, severity, and duration of the shock determine its effect on system performance and level of impact. Attributes of Health System Resilience are;

- ✧ Preparedness to absorb and adapt to shocks.
- ✧ Effective response to challenges and changes at different levels
- ✧ Adaptation and transformation through learning from past experiences
- ✧ Continuously providing critical functions and essential services
- ✧ A focus on delivering high-quality care services under varying conditions.

Resilience means not just withstanding shocks but also adapting and even transforming to a better state than earlier in response to changes.

Essential to a resilient healthcare system is the building of essential resources. Medical Technology Assessment together with resource mapping guides the way to the proper distribution and utilization of resources and services efficiently. Innovative system development based on learning through past experience for Safe, Quality, Productive, customer-focused service delivery is a must. A motivated and skilled health workforce is the cornerstone of success, not only during crises but also in preparedness and management. Accurate and timely information systems, integrated with alert mechanisms, are vital for early detection of emerging health threats.

Ensuring sustainable financing mechanisms, including resource pooling and alternative sources such as social health insurance and earmarked tax

system need to be explored. In addition, new avenues for income generation mechanisms, such as manufacturing medicines for exports, medical tourism, and education tourism should be considered. Our efforts must prioritize health equity and social justice, empowering and engaging communities in their health needs is an essential path for resilience. Empowered visionary leadership and improved governance underpin the success of all these strategies.

The country has a rich history of resilience and boundless experience in health system resilience, which is very much limited in the region and other parts of the world. The health system faced challenges, survived, and thrived in the past. Hence, health managers have to shift their focus beyond planning and implementing interventions to ensure that the healthcare system exhibits resilience when facing unforeseen circumstances.

Embracing new perspectives, such as International Collaboration (Breaking down silos, thinking, and collaborating across units, sectors, and ministries), Beyond Boundaries (collaboratively managing innovative alternatives and

expanding into the international arena), Teamwork (prioritizing team performance over individual achievements) will not elevate our profession within the healthcare sector but also extends its impact beyond these boundaries.

Presently, we are confronted with formidable challenges in delivering healthcare services, including the provision of essential medicine, laboratory services, brain drain of the health workforce, and financial hardship. On top of that, the risk of CBRNE (Chemical, Biological, Radiological, Nuclear, and yield Explosives) hazard is a major concern in the global context. Natural disasters build on additional risk to the health sector. These limitless obstacles hinder us from moving forward in our motherland as a whole.

As health professionals of the current era, we are at a crucial juncture where we need to make decisions like, “Now OR Never” considering all the above obstacles. *“Again, we struggled, we are surviving now, and we will definitely thrive soon as a country, that’s how the history says”*. But, we should not overlook the opportunity to sustain this time, for the betterment of the future generation.

***“The greatest threat to our society is the belief that someone else will save our country”.***

It is high time to call upon all the sectors of the nation, beyond the boundaries towards the common goal, **“One Country, One Health”** for the sake of our motherland and citizens, during this challenging period. Please remember that past success is the future killer. Think differently, act differently, and achieve differently since crisis, always a good opportunity for a good leader to create new future.