

**Accomplished Performance Submitted for Consideration in connection with
the United Nations Public Service Awards (UNPSA) for 2022**

Type of Awards: Fostering innovation to deliver inclusive and equitable services

Name of the Performance Accomplished: Stroke care Evolution in Thailand: Past, Present and Future

Name of Organization: Neurological Institute of Thailand (NIT), Department of Medical Services, Ministry of Public Health.

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1. Objective of the initiative

Please briefly describe the initiative, what issue or challenge it aims to address and specify its objectives. (300 words maximum)

Stroke is a common neurological disorder and becomes a major public health concern of the world's population. According to the World Health Organization report in 2019, stroke was the second leading cause of death for people across the globe, and there were approximately 14.5 million of new stroke cases reported each year.

In Thailand, according to the Ministry of Public Health, the stroke incidence rate in 2019 was 542.54 per 100,000 population while the stroke mortality rate was 52.97 per 100,000 population. Stroke creates major burdens of disability not only for patients and their families, but also the national economy.

In order to reduce the stroke related mortality in Thailand, the Neurological Institute of Thailand (NIT), a specialty hospital devoted entirely to the study and treatment of nervous system disorders in the country, has long been initiated and developed the standard of care for effective stroke treatment, which has been accepted worldwide and practically applicable. This includes intravenous thrombolysis, inpatient stroke units, open skull surgery to relieve intracranial pressure, and the use of the catheters to remove the blood clots in the brain (thrombectomy). These stroke managements have been found to reduce the hospital mortality rate from 15.1% in 2012 to 7.8% in 2021. In addition, our institution has transferred this knowledge to the networks in all provinces across the country to develop a standard stroke

care system, while proposing a health benefits package for all Thai citizens including economically disadvantaged and vulnerable groups to have equal access to necessary stroke treatments.

2. Alignment with the Selected Category

Please explain how the initiative is linked to the selected category. (100 words maximum)

The Neurological Institute of Thailand has used the innovative approaches to develop the standard of stroke care system through networking with a partner hospital nationwide. This aims to deliver the quality and effective treatments that cover all health service areas, allowing people in the regions to gain equal access to healthcare services they need in a timely manner. In addition, knowledge is transferred to healthcare professionals through mentoring and providing advice, while also sending a team of experts to visit the areas to assess and ensure that the care system meets the standards of stroke care.

3. Alignment with the 2030 Agenda

a. Please specify which SDGs and target(s) the initiative supports and describe concretely how the initiative has contributed to their implementation. (200 words maximum)

The revolution of the stroke care system in Thailand initiated by the Neurological Institute of Thailand has allowed and enabled all healthcare services to have the capacity to deliver the quality and effective stroke care. This initiative has been developed to improve equal and readily available access to stroke care services for all Thai people of all ages, regardless of genders, ethnicities, and religions. In addition, we have carried out the research to examine the cost effectiveness and efficacy of stroke treatments using the catheters to remove blood clots in the brain and proposed a health benefits package that allows the reimbursement of healthcare expenditures. This particularly allows equal access to those who are economically disadvantaged. This initiative is well aligned and supports the SDGs goal 3: Ensure healthy lives and promote well-being for all at all ages, including access to quality essential healthcare services.

b. Please describe what makes the initiative sustainable in social, economic and environmental terms. (100 words maximum)

The NIT has developed and transferred a stroke system of care to healthcare professionals across the country. This makes Thailand the only country in Asia that its population has readily access to quality stroke care, and increasing the treatment rate for intravenous thrombolysis from 5% to 20% in 2021. Moreover, thrombectomy treatment has been found to reduce disability for 70%, thereby decreasing costs from 532,896 Baht to 91,261 Baht in 12 months after discharge. Therefore, we have studied the cost effective of stroke treatments and proposed the health benefits package for all Thai citizen to access the standard stroke services.

4. Relevance to leaving no one behind

a. Please explain how the initiative has addressed a significant shortfall in governance, public administration or public service within the context of a given country or region. (200 words maximum)

This initiative considers the dignity of human beings, the underprivileged, women, and the poor in rural areas, with less access to healthcare than urban ones, where social inequalities arise. To achieve the goal, a stroke system of care has been developed, along with making a health benefits package to cover all areas for all Thais to access services. In addition, policies have been proposed to the executives to establish a national stroke service plan to provide health services that meet the needs of the people and increase the efficiency of healthcare units.

This allows people to receive high-standard services by having all service networks linked seamlessly. As a result, hospitals in all health districts throughout Thailand have developed a stroke system of care to meet the standards. The idea of leaving no one behind has been continued by the involvement and engagement of new generation to develop the treatments and achieve key goals, ensuring the drive towards the sustainable development. By 2030, all people especially the poor and vulnerable groups will have been ensured to have

equal rights to economic resources, sufficient use of technology, including access to healthcare services. Relevance to leaving no one behind.

b. Please describe how your initiative addresses gender inequality in the country context. (100 words maximum)

The Neurological Institute of Thailand, as a specialty hospital devoted entirely to the study and treatment of nervous system disorders in the country, has employed the innovative approaches that have been widely and internationally accepted, into the development of stroke care in Thailand. This includes expanding network of hospitals and providing services to stroke patients in all regions of Thailand. This allows all individuals, regardless of their genders, age, ethnicities, and religions to have equal access to quality healthcare services.

c. Please describe who the target group(s) were, and explain how the initiative improved outcomes for these target groups. (200 words maximum)

The development of this initiative aimed to target all the individuals to ensure equal opportunities for all, regardless of their genders, age, ethnic backgrounds, and healthcare coverage. The initiative has resulted in decreasing the stroke related mortality rate from 15.1% in 2012 to 7.8% in 2021. Additionally, efforts have been made to increase public awareness of warning symptoms, risk factors and treatment of stroke. This results in increasing the rate of intravenous thrombolysis treatment from 5% to 20% in the recent year, while reducing the post-stroke disability to 53%. In addition, with the use of thrombectomy, the mortality rate was reduced from 80% to 30%, while 46% of post-stroke patients were able to carry out activities of daily living compared to those who did not receive such treatment.

5. Implementation

a. Please describe how the initiative was implemented including key developments and steps, monitoring and evaluation activities, and the chronology. (300 words)

The key developments, monitoring, and evaluation of this initiative include: 1) adjusting the clinical guidelines and making it more practical such as the use of antiplatelet therapy within 48 hours of symptom or thrombolytic therapy in the patients with the clots in the brain

and heart attacks; 2) creating the special channel for patients to receive intravenous thrombolysis within 4 hours of stroke onset; 3) performing open skull surgery to relieve intracranial pressure in consultation with the neurosurgeon and the evidence-based medicine; 4) organizing and treating patients on an inpatient stroke unit equipped with a multidisciplinary team of stroke specialists; and 5) treating patients with thrombectomy, incorporated high levels of coordination using the telemedicine with treatments available 24 hours, 7 days a week.

This stroke initiative, aiming to reduce the rates of mortality and disability, has led to the recommendation and development of policy called "Stroke Service Plan". Through this initiative, the partner hospitals across the country have the capacity to deliver quality and standard of care with good referral system. Also, we have developed the quality indicators and closely monitored and evaluated the outcomes, including the use of benchmarking to compare the performance outcomes among hospitals. Our stroke systems of care meet the criteria and standard set forth by the Ministry of Public Health, while the quality indicators have jointly been evaluated by the Thailand Angles Award and World Stroke Organization Angles Award. This results in the continuous and sustainable improvement, while reducing the rates of mortality and disability, healthcare costs, and burden to the patients and their families, as well as improving the quality of life.

b. Please clearly explain the obstacles encountered and how they were overcome. (100 words)

The main obstacle to stroke management in Thailand is the high stroke related mortality rate, especially patients with hemorrhage stroke. This in turn affects the overall stroke mortality. To overcome this issue, we plan to raise public awareness of stroke, including managing blood pressure, reducing sodium intake, and engaging in physical activity. These contribute to lowering risk factors of stroke. Moreover, the stroke treatments and referral systems have been modified to improve quality of care and patient health outcomes. All patients with hemorrhage stroke are treated in the inpatient stroke units to minimize the rates of complications and death.

6. Innovation

a. Please explain in what way the initiative is innovative in the context of your country or region.

(100 words maximum)

The NIT has been the first institution to initiate and develop the system for the management of patients with acute stroke. We have also developed the stroke fast tract protocol for thrombolysis and thrombectomy treatments aiming to minimize the disability and mortality using the advanced medical technology such as the use of specialized x-ray equipment, catheters and a variety of synthetic materials to remove a clot from the brain. And set up referral system for distance area and training medical personal. Yet, we could implement it in the context of Thailand, providing services to those residing in the rural areas.

b. Please describe, if relevant, how the initiative drew inspiration from successful initiative in other regions, countries and localities. (100 words maximum)

Stroke has increasingly been recognized as one of the most prevalent neurological disorders with high burden to the patients, their families, contributing to high rates of disability and mortality. The stroke managements, that have been used in the past, contribute to residual disability after stroke, high rates of complications, long-term disability or death, presenting major and humanistic burden to both families and hospitals. These have inspired us to make the stroke care revolution, working collaboratively with interprofessional teams specialized in stroke care and developing treatments plans suitable for each individual, resulting in improved patient outcomes and reducing healthcare costs.

c. If emerging and frontier technologies were used, please state how these were integrated into the initiative and/or how the initiative embraced digital government. (100 words maximum)

The telemedicine has been used to provide a variety of professional and medical consultation to partner hospitals located in rural areas. In addition, the Mobile Stroke Unit, fully equipped with treatment machines has been deployed, allowing specialist physicians to evaluate and treat the patients with suspected stroke rapidly and accurately prior to transport the patients to the hospital. In the near future, we believe that the 5G technology will play

a critical role in the stroke care, particularly in relation to the transmission of brain imaging for review in real time, facilitating timely treatments.

7. Adaptability

a. Has the initiative been transferred and/or adapted to other contexts (e.g., other cities, countries or regions) to your organization's knowledge? If yes, please explain where and how. (200 words maximum)

The knowledge and use of advanced technology, including intravenous thrombolysis, inpatient stroke units, open skull surgery to relieve intracranial pressure, and the use of the catheters to remove the blood clots in the brain (thrombectomy) have been transferred to healthcare professionals within and outside the country. We have also provided consultation to our neighboring ASEAN countries such as Myanmar, Laos, Cambodia, Vietnam, Indonesia, Malaysia, and the Philippines. This contributes to the early management of patients with stroke using the thrombolysis, as well as the development of inpatient stroke units in such countries.

b. If not yet transferred/adapted to other contexts, please describe the potential for transferability. (200 words maximum)

The initiative has been transferred and adapted for use in other ASEAN countries since 2016 until now.

8. Resources

a. What resources (i.e. financial, human or others) were used to implement the initiative? (100 words maximum)

The initiative has received partial funding from the Department of Medical Services and the NIT. The implementation of this initiative was based on the idea of 'the best for the most', aiming for knowledge creation and transfer to other partner hospitals. We have developed the clinical practice guidelines for stroke. Over the past 15 years, we have sent a team of stroke experts to visit the service areas and provide consultation. Last, the thrombectomy project has

been developed to provide quality and affordable stroke care to patients with stroke who cannot obtain the reimbursement for health services.

b. Please explain what makes the initiative sustainable over time, in financial and institutional terms. (100 words maximum)

To make the initiative sustainable over time, knowledge transfer and the conduction of research for stroke management both in terms of Routine to Research (R2R) and the creation of new knowledge have been employed. Additionally, the development and use of quality indicators, including benchmarking to measure, monitor, and compare the quality and performance result in the continuous and sustainable improvement. Moreover, the policy recommendations particularly in relation to stroke management in Thailand have been proposed to address the issues and concerns relating to stroke.

9. Evaluation

a. Was the initiative formally evaluated either internally or externally?

Yes No

b. Please describe how it was evaluated and by whom? (100 words maximum)

The development of stroke initiative has been evaluated by both internal and external organizations including the evaluation of Disease Specific Certification: Stroke (DSC) by the Healthcare Accreditation Institute (Public Organization) and the Thai Stroke Society. In addition, this initiative has been evaluated and certified as the Standard Stroke Center from the Ministry of Public Health. In term of quality indicators, this stroke initiative has been evaluated and received Thailand Angles Award and World Stroke Organization Angles Award from the Ministry of Public Health.

c. Please describe the indicators and tools used. (100 words)

The indicators and tools used include the quality indicators for stroke management comprising 4 components: 1) the standard of stroke care; 2) the process of stroke care; 3) the outcomes; and 4) the complications. Such as mean time to intravenous thrombolytic therapy

(Door to needle time), percentage of stroke patients who have swallowing evaluation within 72 hours of admission, percentage of stroke patients who gets rehabilitation and physical therapy within 72 hours of admission, percentage of readmission within 28 days of stroke patients, percentage of mortality of stroke patients, percentage of incidence of pneumonia in stroke patients. etc.

d. What were the main findings of the evaluation (e.g. adequacy of resources mobilized for the initiative, quality of implementation and challenges faced, main outcomes, sustainability of the initiative, impacts) and how this information is being used to inform the initiative's implementation. (200 words maximum)

The data collected for quality indicators and the quality evaluation focused on standard stroke management have contributed to improving hospital capacity for quality stroke care, despite limited resources and treatment facilities (particularly located in geographically isolated and disadvantaged areas). This is in part due to the ongoing knowledge transfer (train-the-trainer) to the healthcare professionals. As a result, the resource-poor or constrained hospital settings remain capable of providing quality and standard of care. A significant decline in stroke-mortality rate is apparent, falling from 15.1% in 2009 to 7.8% in 2021. This in turn contributes to reducing the rates of disability and enhancing the quality of life of patients suffering from stroke.

10. Institutional Setup

Please describe how the initiative is inscribed in the relevant institutional landscape (for example, how it was situated with respect to relevant government agencies, and how the institutional relationships with those have been operating). (200 words maximum)

This stroke initiative has received supports and collaboration from the administrators of relevant institutions including the Ministry of Public Health, the Department of Medical Services, the Neurological Society of Thailand, the Thai Stroke Society, and Private Hospitals, as well as the experts of the university hospitals and the National Health Security Office. In addition, we have also received support from the private sectors in the development of the

Thailand Angels Project. The support and collaboration across the government and private sectors is critical in developing and shaping a stroke care system that is better able to serve people in a fast-changing world.

11. Stakeholder Engagement

The 2030 Agenda for Sustainable Development puts emphasis on collaboration, engagement, coordination, partnerships, and inclusion. Please describe which stakeholders were engaged in designing, implementing and evaluating the initiative and how this engagement took place. (200 words maximum)

Everyone, including marginalized populations physically and socio-economically separated from the mainstream society can have access to quality essential treatment across the country. Through knowledge transfer, we have worked collaboratively and engaged with healthcare professionals in the ASEAN countries including Myanmar, Laos, Cambodia, Vietnam, Indonesia, Malaysia, and the Philippines. To facilitate the development of optimal stroke care models, our institution has accepted visits from other hospitals/healthcare professionals. In addition, we have made collaboration within and outside the institution, aiming to expand our hospital network and enhance the quality of care. To ensure sustainable improvement and achieve shared goals, our institution and the partner hospitals work together to evaluate the outcomes through the standard Stroke Center Certification, the Thailand Angels Award and the World Stroke Organization Angels Award. Furthermore, to facilitate unprecedented levels of collaboration and development of proactive health services, our institution has signed a memorandum of understanding (MOU) with the various stakeholders including the Department of Medical Services, the PTT Oil and Retail (OR), the PTT Public Company Limited (PTT), and the Electricity Generating Authority of Thailand.

12. Lessons Learned

Please describe the key lessons learned, and how your organization plans to improve the initiative (200 words maximum)

It is learned that when the importance of the initiative was known by the executives, it greatly influences and contributes to the success of the development. A clarification is required to point out the benefits that people will receive, in order to raise awareness and obtain support. As this initiative involves many healthcare professionals, it is important to clearly define goals for the involvement of the personnel. In addition, the knowledge transfer to relevant healthcare professionals should be done continuously in order to keep the body of knowledge up to date. The most important thing that makes this initiative successful is the cooperation of networks across the country to jointly develop a stroke system of care to become a national policy.

This initiative has been further developed towards the stroke care in the future as a proactive care system by leveraging the advanced medical technology to enhance the efficiency of stroke care with treatment on Mobile Stroke Unit, using a telemedicine system. This enables immediate treatment for acute stroke before the patients arrive at the hospital and reduce the duration of treatment. As a result, patients have a greater chance of survival and reduced disability.