Insights Series

Breaking down borders

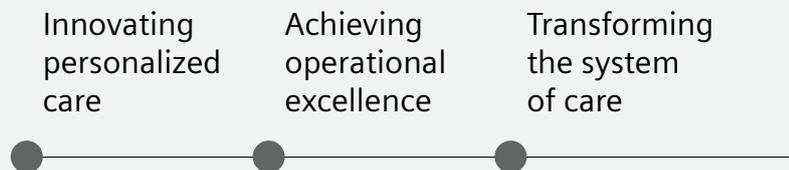Digital interoperability across health systems in Southeast Asia

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Preface

The Insights Series

The Siemens Healthineers *Insights Series* is our preeminent thought leadership platform, drawing on the knowledge and experience of some of the world's most respected healthcare leaders and innovators. The Series explores emerging issues and offers practical solutions to many of today's most pressing challenges in healthcare.

The *Insights Series* focuses on three overarching themes that we believe will define healthcare in the years ahead—three broad trends that encompass the most remarkable advances in healthcare, the most promising opportunities, and the most pressing challenges. These three themes serve as the cornerstones of the *Insights Series*.

Innovating personalized care	Achieving operational excellence	Transforming the system of care

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At Siemens Healthineers, we pioneer breakthroughs in healthcare. For everyone. Everywhere. Sustainably.

Introduction

On July 5th, 2023, Health Ministry representatives from five countries met for a day in Singapore, along with other health leaders, officials and data experts, to discuss ways in which they could improve their respective healthcare systems. APACMed, which is a trade association that strives to promote innovation and advance healthcare access for patients in Asia Pacific, drives this important policy movement by bringing different stakeholders from the industry together.

The countries—Singapore, Malaysia, Indonesia, Thailand and Vietnam—are members of the Association of Southeast Asian Nations (ASEAN). The goal of the conference was to develop a plan to promote interoperability and international health data standards across the ASEAN region, beginning with national health information exchanges, establishing relevant information technology (IT), infrastructure, legal, regulatory and cybersecurity frameworks, and enabling easier, more secure governance and processes across ASEAN. The aim was ultimately to improve access to, and sharing of, data nationally and across borders, in the hopes of improving access to care and fostering precision medicine.

Certainly, it is not hard to understand the "burning platform", the problem that ASEAN countries are trying to solve. The demand for healthcare across the region is growing. Providers are contending with a host of challenges, many of which are familiar to providers in other countries. These include serving more patients, dealing with a growing, ageing population; expanding access to care to underserved communities; responding to higher patient expectations in terms of quality and availability, staying on top of accelerated technology innovation cycles; evaluating an exploding amount of information from new clinical insights and patient data; and complying with growing requirements on documentation.

There is also an epidemiological shift from infectious diseases to a chronic disease pattern matching western markets. Another challenge is the shortage of healthcare professionals in the region. The World Health Organization has estimated a global shortfall of nine million nurses, with some of the worst affected countries located in Asia.[1] Finally, there is the problem of fragmented patient information, which can affect continuity of care, especially for chronically ill patients.

The current labor-intensive care delivery models in Asia are struggling to meet that region's rising healthcare needs. As healthcare systems are primarily publicly funded in ASEAN countries, finding ways to improve operational efficiency in healthcare remains an urgent public priority, along with prioritizing quality and access for patients.

Simply put, health professionals in Southeast Asia are having to do more with less, and to do that, they must increase interoperability.

The challenge

The case for interoperability

There is a growing understanding in healthcare circles that interoperability—the ability to exchange and use health data among healthcare providers within and also between countries—can help drive research and innovation, increase efficiency and create value. It is key to improving health and healthcare.

Without interoperability, research has shown that providers must acquire patient information through retesting as much as 32% of the time.[2] This kind of duplication results in delays in patient care and financial stress on overwhelmed healthcare systems. On the other hand, if interoperability has ensured that health providers have access to a patient's up-to-date health data, they can provide more efficient, higher quality, safer and more personalized care and care coordination. This scenario is reflected in a study from the USA showing that, in cases of patients with a head trauma, when physicians at a specialist hospital could review images while the patient was still in their local hospital and provide input into their care, patient transfers were reduced by 44%.[3]

Sharing data between countries is not a new idea

The benefits of sharing data, information and knowledge between countries have been recognized, and leveraged, for some time. Perhaps the best example of this is in the area of cancer, where international measurement and reporting has existed for nearly 60 years. The International Agency for Research on Cancer (IARC) was launched in 1965, and over the past five decades, IARC has conducted research worldwide and helped thousands of cancer researchers from developing countries hone their skills through fellowships, courses, and collaborative projects.[4]

More recently, NordForsk is an organisation established in 2005 to provide funding for and to facilitate Nordic cooperation in research and research infrastructure. Denmark, Finland, Iceland, Norway and Sweden share information and work together in order to increase public health and welfare in the Nordic countries through multi-disciplinary research.

The EU, meanwhile, is making significant investments in a pan-European information infrastructure to drive biomedical research, health system surveillance and clinical information exchange, thereby improving patients' access to quality care and their care experience. In 2022, the European Commission published a proposal to create what it is calling a European Health Data Space, enabling citizens of the EU to gain secure access to their electronic health data by establishing a market for digital health.[5]

The need to do more with less combined with an epidemiological shift from infectious diseases to a chronic disease pattern and the kind of scientific advances that allow us to understand the complexity of disease, make the sharing of data information between countries more important than ever. And we now have the digital technology that allows us to do this. All that is needed now is for countries to do the heavy lifting. They need to work together to lay the essential governance groundwork for multi-country projects and invest in infrastructure for multi-country initiatives.

It all starts, however, with the adoption of a national health record, based on international standards, that allows for interoperability between providers, which serves as a basis for drastically improving efficiency within a country. But this then creates the possibility of sharing patient data across countries, enabling patient mobility and further improving efficiency and patient access to care. This was what brought the ASEAN countries together in Singapore.

32%

of redundant patient information delays patient care and causes financial stress

ASEAN Interoperability and Health Data Roundtable

Current landscape and challenges

The meeting of ASEAN countries in Singapore was informed by a few basic realities. The first was that interoperability, the sharing of health records, data and knowledge, was a rising tide that would lift all of their boats. The benefits were clear. As was the fact that the technology needed for this information sharing also exists, and is also available. However, the other clear reality was that in order to achieve ASEAN interoperability, several challenges would have to be overcome.

The challenges start at home. Governments must mandate and legislate new data policy, while also putting in place the means to execute that policy. Capacity must be built for the gathering and deploying of patient data.

Which means, of course, that patients need to be brought on board. That requires a level of trust that is not always easy to achieve. Institutions and the people who work in them also have to be bought in, as the shift to a national patient record, which will then be shared with other countries, represents an enormous cultural shift. Trust and digital literacy level need to be built up in everyone involved.

The even bigger challenges are more technical in nature. The complexity of integrating diverse data sources across borders is daunting. It becomes even more so when one takes into account data privacy and security concerns.

Far and away the biggest challenge, however, is that the ASEAN countries begin this process at completely
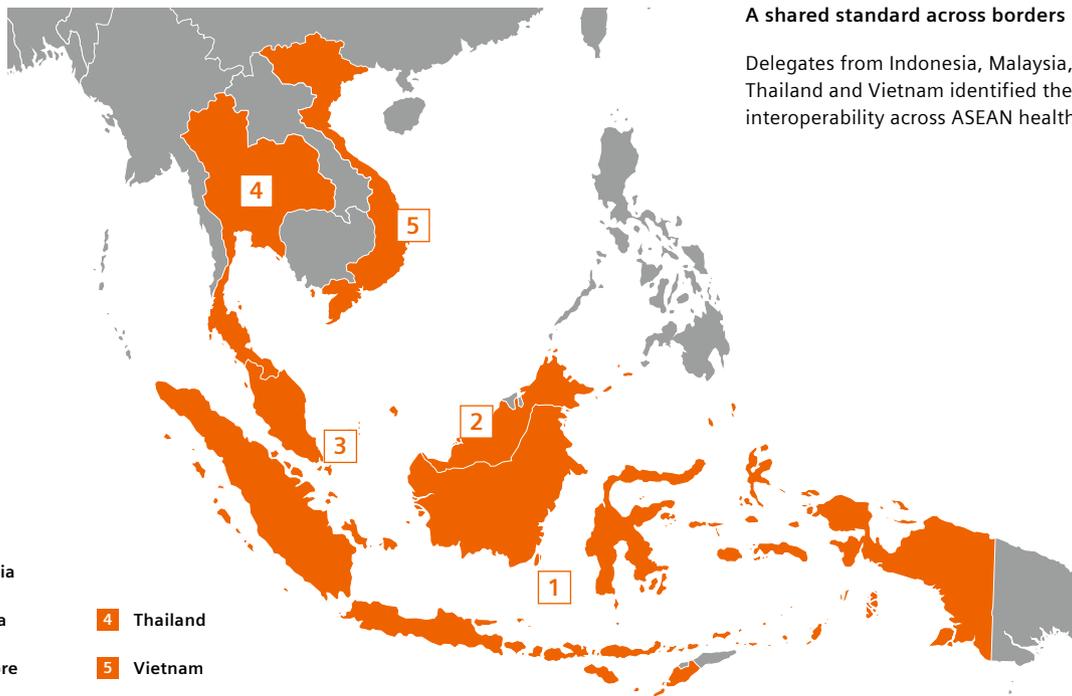
A shared standard across borders

Delegates from Indonesia, Malaysia, Singapore, Thailand and Vietnam identified the need for interoperability across ASEAN health systems.

1 Indonesia

2 Malaysia   4 Thailand

3 Singapore   5 Vietnam

different levels of digital maturity. Some are currently coping with fragmented IT infrastructure. Others are struggling with providing reliable internet access for servers in health facilities. Still others are looking at entering into a healthcare data interoperability agreement even though they are still using paper-based patient records, and are still learning how to properly identify data and introduce automated data collection and entry.

For the ASEAN interoperability dream to come true, all member countries will have to be brought to a certain comparable level of digital maturity, and have data platforms that comply to international standard.

With those challenges in mind, healthcare leaders from Singapore, Malaysia, Thailand, Indonesia and Vietnam launched the interoperability discussion in July, comparing their different health data landscapes, sharing with one another their different views and positions, and beginning the complex discussion about what the collective path forward looks like, and how to ensure that all countries are walking it together.

The critical importance of standards

Dr. Adam Chee, the Chief of the Smart Health Leadership Centre in Singapore, set the tone and context for the day early on, making it clear that the first and most important thing that needs to happen is that ASEAN countries need to agree on the international health data standards that participating countries would have to adopt.

The importance of this cannot be overstated. They provide the technical framework and clinical language that enable hundreds, or thousands, or tens of thousands of health care providers to communicate and share health information that is contextual and unambiguous. They enable transparency and understanding. They promote common, clear meanings for data that is often reused. They enable access, because the same common codes, terms and data structures that were used to collect and store information can be used for data retrieval. They encourage and enable reuse of data and software for multiple purposes.

Standards are a common language. If a multitude of countries agree to use the same set of international standards, then they will have settled on a common language. Several sets of international standards exist. One is not necessarily better than another, but they do hold important distinctions. Different standards could have varying definitions of what constitutes malnutrition or diverging definitions of types of gender. It was established early and reiterated often in Singapore that agreement on health data standards will be critical.

The Austrian model

The committee also heard from Dr. Guenter Rauchegger, who leads Austria's implementation journey as that country moves to a national electronic health record. Austria's goal, down the road, is to be able to join the European Union health data space, which makes their experience there highly relevant to the situation in Southeast Asia.

Austria is a federal republic, where the major stake-holders in the healthcare system are the federal ministry of health, different insurance carriers, and the federal states which are the main operators of the hospitals. Austria's main objective was very familiar to the ASEAN nations—to allow for seamless information exchange between different healthcare providers so that they can always work with up-to-date patient information.

As Dr. Rauchegger explained, the effort in Austria began with establishing a legal framework and having a committee with clear decision-making capacity to come up with legislation and accompanied regulations. The second step was to decide on semantic inter-operability, meaning the setting of common standards, terminology and identifiers. The final step involved technical and process interoperability, creating standardized interfaces and workflows and ensuring data privacy and security. For technical interfaces, Austria has adopted IHE, which is a common framework provided by an international organization for building effective solutions to close the communication gaps between systems and foster their interoperability. It has also adopted HL7 CDA for semantic definitions, and HL7 FHIR for future extensions.

By bringing all the different players together, agreeing on common standards and procedures—in effect establishing healthcare interoperability—Austria laid the groundwork for the development of national patient record, the first step toward being a part of the European health data space.

Electronic Health Record in Austria

ELGA (Electronic Health Record Austria) is a joint project of the federal government, the federal states and Austrian insurance carriers. It was launched in 2015. A cornerstone of healthcare reform in Austria, its goal was to strengthen the cross-sectoral collaboration of healthcare service providers.

ELGA was informed by the understanding that a comprehensive electronic health information system that allowed for the sharing of patient medical information between different healthcare providers, based on international standards, would improve the quality, accessibility, and security of patient data, ultimately enhancing patient care while reducing administrative burdens on healthcare professionals.

Unless an Austrian citizen has declined to participate in ELGA, they are automatically enrolled in the nationwide Electronic Health Record, which grants health providers access to relevant patient health records, as well as medication history and vaccination data, and allows patients access to their complete health records.

ELGA offers a range of features that ASEAN healthcare leaders gathered in Singapore all agreed were extremely valuable. These include:

Interoperability: ELGA connects all healthcare providers, including hospitals, clinics, pharmacies, and laboratories, ensuring seamless sharing of patient information.
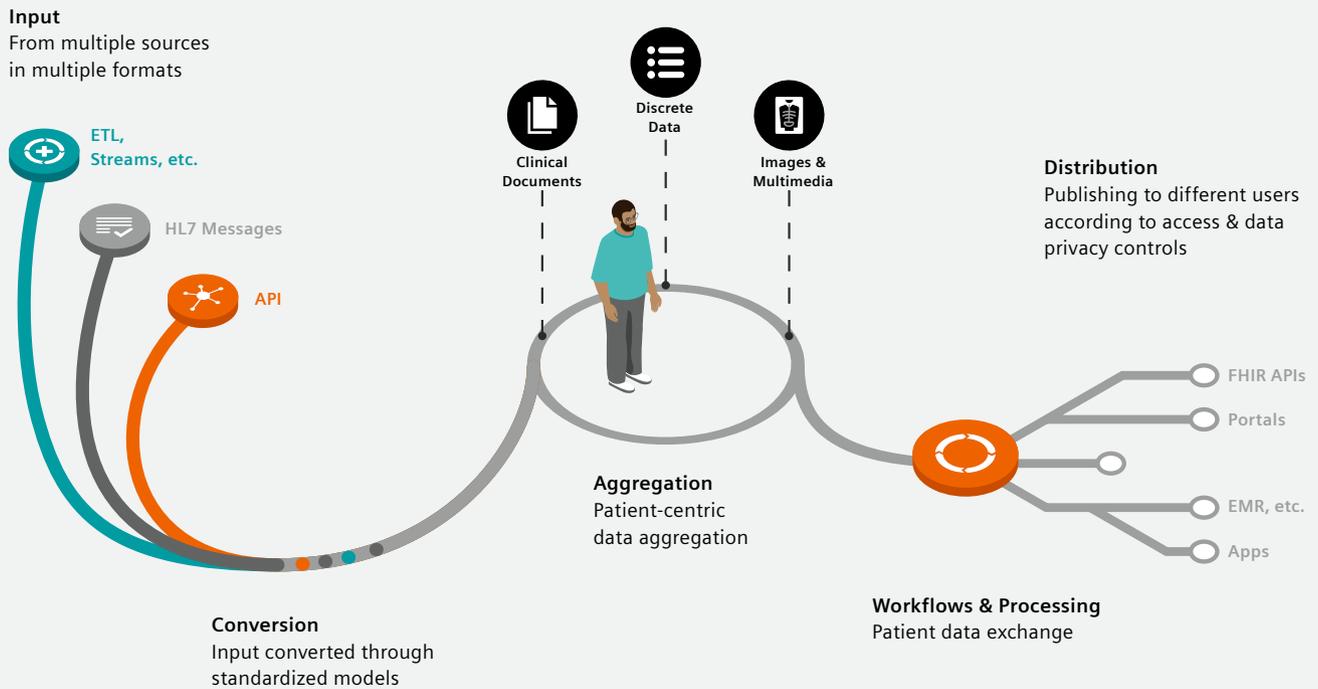
Patient-Centric: ELGA places patients at the center of their own healthcare journey, giving them secure access to their EHRs, allowing them to track their medical history, prescriptions, and test results.

Data Security: ELGA employs robust encryption and authentication protocols to protect sensitive patient information, ensuring compliance with stringent data privacy regulations like GDPR.

Time Efficiency: ELGA significantly reduces administrative tasks, freeing up more time for patient care, ultimately improving the quality of healthcare services.

The ELGA Electronic Health Record system has been a widely acclaimed success. It has improved patient care, enhanced coordination among healthcare providers, reduced costs, and facilitated medical research. It can serve as a model for countries looking to harness the power of EHRs to revolutionize their healthcare systems—countries such as the ASEAN nations who gathered in Singapore to discuss this very subject.

Interoperability across platforms and formats

Input
From multiple sources
in multiple formats

ETL,
Streams, etc.

HL7 Messages

API

Clinical
Documents

Discrete
Data

Images &
Multimedia

Distribution
Publishing to different users
according to access & data
privacy controls

FHIR APIs

Portals

EMR, etc.

Apps

Aggregation
Patient-centric
data aggregation

Conversion
Input converted through
standardized models

Workflows & Processing
Patient data exchange

Conclusions from the ASEAN
digital health roundtable

Following several hours of knowledge exchange, the ASEAN Health Ministry leaders took the discussion to the logical next step, asking the central question of the entire day: If interoperability between these countries is to happen, what needs to be done? The answer they reached contains three critical steps.

1 **Digital maturity roadmap**

It was agreed that priority one would have to be assessing the current digital maturity level of each country. Down the road, a level digital playing field is going to be required, and if countries are going to get there, they need to know where they are starting. A transparent examination of every member's digital situation will allow everyone to formulate a comprehensive roadmap for digital transformation journey—one that takes into account where the individual country is starting, as well as the place where all the countries want to end up.

Important in all of this is the fact that these countries can work together. It is to everyone's advantage to have all countries reach a desired maturity level, so more advanced nations will offer peer-to-peer learning opportunities to expedite all efforts towards digital transformation.

2 **ASEAN standard setting**

As was demonstrated in Austria, a crucial initial step in mobilizing the healthcare industry to work towards achieving interoperability is to establish a legal framework within which to do that work. Understanding this, the ASEAN health leaders committed to prioritizing digitalization in healthcare by formalizing a mandate to support it. To that end, they reached a consensus to include discussions on necessary standards for digital transformation in healthcare in future meetings and upcoming forums.

Additionally, the leaders agreed on the importance of aligning across ASEAN on defining the primary use case, minimum data set, and minimum digital maturity required. One example: the primary use case could focus on enhancing emergency readiness, particularly in response to situations like a recurring COVID-19 outbreak. A secondary use case could focus on research and development.

3 **Health data sandbox**

A data sandbox is a secure environment that allows researchers to test and learn with real-world data. Data sandboxes help teams make more informed decisions by giving them access to valuable insights in large datasets. The ASEAN health leaders agreed to establish just such a health data sandbox, which will serve as a testing ground to experiment, evaluate, and learn from potential ASEAN interoperability and data sharing initiatives.

Next steps

The ASEAN health leaders emerged from their Singapore meeting with resolve and enthusiasm. But they also acknowledged that they had a great deal of work to do. The path forward involves several key steps:

1. Hospitals, other health organizations and providers must all proactively prepare for the digital healthcare transformation they know is coming. Their governments have now signalled that they intend to boost operational efficiency through interoperability, and that is goal that providers everywhere must either get behind, or risk being left behind.

2. ASEAN countries now officially plan to implement nationwide health record systems, with cross-border data exchanges and an eventual mandate looming. Providers will soon be obligated to share data. Consequently, it is imperative that they assess their current digital maturity and chart a roadmap to reach the required level.

3. In addition to digitizing patient data and processes, providers must ensure compliance with international standards to facilitate regional data sharing.

4. The prospect of a rapid digital transformation in healthcare may appear daunting, but providers need not face this challenge alone. Off-the-shelf, plug-and-play digital solutions are available to expedite the journey toward digital maturity. Furthermore, consulting services are available to help hospitals and other providers to evaluate their current situation and explore tailored solutions.

In summary, the evolving landscape of diseases and scientific advancements calls for enhanced global data collaboration, underpinned by digital technology. The ASEAN countries have taken up this challenge. To navigate this transformation successfully, hospitals, governments, and healthcare stakeholders in all the ASEAN countries must work together, ensuring that data is shared securely and efficiently, both within and across borders.

↗ Suggested follow-up

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- *Insights Series*, Issue 43:
  Digital platforms in healthcare.
  Available at:
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  news/digital-platforms-in-healthcare**

- *Insights Series*, Issue 26:
  How innovators are driving digital
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✉ Contact:

For further information on this topic,
or to contact, please contact:

André Steinbuss
Global Head of Achieving Operational Excellence
andre.steinbuss@siemens-healthineers.com

Virginia Chan
Head of Digitalization, ASEAN
virginia.chan@siemens-healthineers.com

About the authors

Joanne Grau
Thought Leadership Manager
Achieving Operational Excellence
Siemens Healthineers

André Steinbuss
Global Head of Achieving
Operational Excellence
Siemens Healthineers

Joanne has had sixteen years of marketing experience in Siemens Healthineers as marketing director for the diagnostics division based in New York and as Head of Marketing for ASEAN countries based in Singapore. Joanne graduated from UCLA with a degree in molecular biology. Before joining Siemens Healthineers, Joanne was a research scientist in Quest Diagnostics (formerly Celera) and has authored multiple publications.

André Steinbuss has spent almost ten years in various positions in marketing with a focus on diagnostic imaging at Siemens Healthineers. André graduated in medical technology engineering at the University of Applied Sciences in Luebeck. Before joining marketing, he spent ten years in research and development in the hearing instrument business of Siemens. During this time, he has authored multiple patents and publications.

About APACMed

The Asia Pacific Medical Technology Association (APACMed) represents manufacturers and suppliers of medical equipment, devices and in-vitro diagnostics, industry associations and other key stakeholders associated with the medical technology industry in Asia Pacific. As a trade association, its mission is to improve the standards of care for patients through innovative collaborations among stakeholders to jointly shape the future of healthcare in Asia Pacific.

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At Siemens Healthineers, we pioneer breakthroughs in healthcare. For everyone. Everywhere. Sustainably. As a market leader, we want to advance a world in which breakthroughs in healthcare create new possibilities with a minimal impact on our planet. We've been pushing the boundaries in medical technology for more than 125 years. By consistently bringing innovations to the market, we enable healthcare professionals to innovate personalized care, achieve operational excellence, and transform the system of care.

With the unique combination of our strengths in patient twinning[1], precision therapy, as well as digital, data, and artificial intelligence (AI), we are well positioned to take on the greatest challenges in healthcare. We will continue to build on these strengths to help overcome the world's most threatening diseases, enable efficient operations, and expand access to care.

Our portfolio, spanning in vitro and in vivo diagnostics to image-guided therapy and cancer care, is crucial for clinical decision-making and treatment pathways. We are committed to improving healthcare access for all, limiting our environmental impact as we pioneer breakthroughs, and engaging our diverse Healthineers to achieve this impact on a global scale.

Motivated by our purpose and guided by our values, we are building an inclusive culture, where we embrace diversity in all its forms. We are a team of more than 71,000 Healthineers in over 70 countries passionately pushing the boundaries of what is possible in healthcare to help improve the lives of people around the world.

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[1] *Personalization of diagnosis, therapy selection and monitoring, aftercare, and managing health.*

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