Sustainability of Healthcare Systems in Asia: Exploring the Role of Horizon Scanning and Reassessment in the HTA Landscape

7th HTAi Asia Policy Forum
November 6-8, 2019
Hanoi, Vietnam
Dear colleagues,

It is with great pleasure that I welcome you all to the 7th HTAi Asia Policy Forum, held in the wonderful city of Hanoi, Vietnam. I am especially grateful to the local support that has been provided to us by Dr Nguyen Khanh Phuong, Dr Tran Thi Mai Oanh and their team at the Health Strategy and Policy Institute (HSPI).

The topic this year is ‘Sustainability of Healthcare Systems in Asia: Exploring the Role of Horizon Scanning and Reassessment in the HTA Landscape’. This theme follows on from our successful HTAi Asia Policy Forum meetings in 2017 and 2018 where we discussed the importance of Real World Data and the need for continual evaluation of health technologies. I would also like to draw your attention to the consensus statement on improving access to high cost technologies that we were able to develop after the 2018 Asia Policy Forum.

As you will see from the extensive background paper that has been developed for this year’s meeting, taking a whole of health systems approach to introducing and then disinvesting from health technologies is an important consideration for the Asia region. The 2019 HTAi Asia Policy Forum will delve into the current status of horizon scanning and health technology reassessment in Asia and we will have robust discussions about the potential challenges and opportunities surrounding these concepts. Informing the background paper was a survey of HTA agency members; we are grateful to all who completed this as we had a 100% response rate. In addition to the survey, a literature review conducted by Linda Mundy—HTAi Asia Policy Forum Scientific Secretary for 2019—has resulted in a comprehensive and thought-provoking background paper that provides ‘food for thought’ for the discussions ahead.

As in previous years, the meeting will be formally opened by the Vice Minister for Health, Vietnam. We will enjoy an overview of the Vietnamese health system. The meeting will then feature presentations and case studies from members to highlight particular challenges and reflections facing the region. We are very grateful to those members who agreed to present at the meeting and we are sure that these will provide additional thought provocation and discussion for us all. Both days will feature lengthy breakout group sessions, which will provide the opportunity for members to interact and contribute in smaller groups and attempt to tackle some of the issues raised in the background paper and member surveys.

Regarding our membership, I am proud to welcome 14 industry member organizations and for the first time this year we have attendees from the World Bank and the Gates Foundation. We also will have two patient expert representatives to provide insight to this important stakeholder perspective to the Forum to highlight a very important stakeholder perspective.

As in previous years, we will disseminate the key messages in a brief communique quickly after the meeting followed by the traditional journal publication in the International Journal of Technology Assessment in Health Care (IJTAHC) in 2020. This will be followed by a panel session at the HTAi Annual Meeting which will be held in Beijing 20-24 June 2020.

I would like to finally thank all those who have contributed to the development of the background paper, the meeting program and those who have agreed to present or act as breakout group facilitators or rapporteurs.

I look forward to a busy but productive time at the 2019 HTAi Asia Policy Forum in Hanoi!

Professor Brendon Kearney
Venue Information

Meeting Hotel:
InterContinental Hanoi Westlake
No 5 Tu Hoa Street, Tay Ho District, Hanoi, Vietnam
Phone +84 24 6270 8888
Email: res.hanoi@ihg.com
Website: http://www.hanoi.intercontinental.com/

Directions:
The InterContinental® Hanoi Westlake is located on the peaceful waters of the largest lake in the city and is adjacent to the famous 800-year-old Golden Lotus (Kim Lien) Pagoda. Ideally situated just minutes from the Old Quarter, the hotel offers a welcome haven from the bustling city centre.

Check-in is available from 15:00 on day of arrival. Please check-out before 12:00 on day of departure.

Breakfast provided with your accommodation will be available in Cafe Dulac restaurant, which is located on the first floor of the main building.

Transport options:
The hotel is a 45-minute drive from Noi Bai International Airport via car, taxi or airport transfer. There is also parking available through the hotel at no cost.

To book your airport transfer service through the Intercontinental Hanoi Westlake, please contact the hotel concierge directly at Concierge.Hanoi@ihg.com

Metered Taxis are available on the right side of the arrivals level at both Domestic and International terminals.

https://www.hanoiairportonline.com/public-taxi/
## Agenda

### Wednesday 6th November (pm):

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<thead>
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<th>Time</th>
<th>Activity</th>
<th>Speaker(s)/Facilitator(s)</th>
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<tr>
<td>12:30 – 13:00</td>
<td>Registration (Intercontinental Westlake)</td>
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<tr>
<td>13:00 – 13:30</td>
<td>Travel to National Cancer Centre</td>
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<td>13:30 – 15:00</td>
<td>Tour at National Cancer Centre Organised by HSPI</td>
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<td>15:10 – 16:00</td>
<td>Return to hotel</td>
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<tr>
<td><strong>16:00 – 16:15</strong></td>
<td><strong>BREAK (back at Intercontinental Westlake)</strong></td>
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<tr>
<td><strong>16:15 – 18:15</strong></td>
<td><strong>What’s Keeping Me Up At Night</strong></td>
<td>Brendan Kearney</td>
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<tr>
<td>16:15 – 16:30</td>
<td>Introduction to What’s Keeping Me Up At Night</td>
<td>Brendan Kearney</td>
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<tr>
<td>16:30 – 17:45</td>
<td>Breakout group discussions</td>
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<tr>
<td>17:45 – 18:15</td>
<td>Feedback from groups and plenary discussion</td>
<td>Guy Maddern</td>
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<tr>
<td><strong>19:00 – 21:00</strong></td>
<td><strong>Networking reception at the Intercontinental Westlake, Milan–Saigon Terrace</strong></td>
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### Thursday 7th November

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<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Speaker(s)/Facilitator(s)</th>
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<tbody>
<tr>
<td>08:00 – 08:30</td>
<td>Registration</td>
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<tr>
<td><strong>08:30 – 09:30</strong></td>
<td><strong>Welcome and Introductions</strong></td>
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<tr>
<td>08:30 – 08:40</td>
<td>Opening Address</td>
<td>Iñaki Gutierrez Ibarluzea, Brendon Kearney</td>
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<tr>
<td>08:40 – 08:50</td>
<td>Welcome from Vietnamese Health Ministry</td>
<td>Vice-Minister Nguyen Truong Son</td>
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<tr>
<td>08:50 – 09:10</td>
<td>Overview of Vietnamese Health System</td>
<td>Nguyen Khanh Phuong</td>
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<tr>
<td>09:10 – 09:15</td>
<td>“Rules of Engagement” for meeting</td>
<td>Brendon Kearney</td>
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<td>09:15 – 09:30</td>
<td>Round table introductions</td>
<td>All</td>
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<tr>
<td><strong>09:30 – 11:00</strong></td>
<td><strong>Presentations (Horizon Scanning)</strong></td>
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<tr>
<td>09:30 – 09:50</td>
<td>Horizon Scanning in Asia: overview of background paper and survey results</td>
<td>Linda Mundy</td>
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<tr>
<td>09:50 – 10:10</td>
<td>HTA Agency Case Study: Malaysia</td>
<td>Izzuna Mudla Mohamed Ghazali</td>
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<td>10:10– 10:40</td>
<td>Industry Reaction Panel:</td>
<td>Parashar Patel</td>
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<td>• Franz Pichler</td>
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<td>• Adrian Griffin</td>
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<td>• Indira Umareddy</td>
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<tr>
<td>10:40 – 10:55</td>
<td>Plenary Discussion</td>
<td>All</td>
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<tr>
<td>10:55 - 11:00</td>
<td>Description of the breakout topics</td>
<td>Brendon Kearney; Linda Mundy</td>
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<tr>
<td><strong>11:00 – 11:10</strong></td>
<td><strong>GROUP PHOTO (LOCATION TBD)</strong></td>
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<td>11:10 – 11:30</td>
<td>BREAK (informal networking with tea and coffee)</td>
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<td>11:30 – 13:00</td>
<td>Breakout Session One (go to your breakout room)</td>
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<td><strong>13:00– 14:00</strong></td>
<td><strong>LUNCH; informal networking and preparation of group reports</strong></td>
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<td>14:00 – 15:30</td>
<td>Feedback from breakout groups</td>
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<td>14:00 – 14:30</td>
<td>Reports back from breakout session 1 (ten minutes per group)</td>
<td>Group rapporteurs</td>
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<tr>
<td>14:30 – 15:30</td>
<td>Plenary discussion</td>
<td>All</td>
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<td><strong>15:30 – 16:00</strong></td>
<td><strong>BREAK (informal networking with tea and coffee)</strong></td>
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<td><strong>16:00 – 17:20</strong></td>
<td><strong>International perspectives on Horizon Scanning and Reassessment</strong></td>
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<td>16:00 – 16:20</td>
<td>World Health Organization</td>
<td>Andrew Rintoul</td>
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<td>16:20 – 16:40</td>
<td>Bill and Melinda Gates Foundation</td>
<td>Alexo Esperato</td>
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<td>16:40 – 17:20</td>
<td>Plenary Discussion</td>
<td>All</td>
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<tr>
<td><strong>17:20 – 17:30</strong></td>
<td><strong>Recap of day and logistics for dinner</strong></td>
<td>Brendon Kearney</td>
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<tr>
<td><strong>19:00 – late</strong></td>
<td><strong>Dinner at The Forest Restaurant (bus departs hotel lobby at 18:30)</strong></td>
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<td>Time</td>
<td>Activity</td>
<td>Speaker(s)/Facilitator(s)</td>
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<tr>
<td>08:30 – 09:00</td>
<td>Tea and coffee and informal networking</td>
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<tr>
<td>09:00 – 10:15</td>
<td>Presentations (Health Technology Reassessment)</td>
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<tr>
<td>09:00 – 09:20</td>
<td>Health Technology Reassessment in Asia: Overview of the background paper and survey results</td>
<td>Linda Mundy</td>
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<tr>
<td>09:20 – 10:10</td>
<td>Panel discussion and audience Q&amp;A</td>
<td>Brendon Kearney</td>
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<td>• Sudigdo Sastroasmoro</td>
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<td>• Songhee Cho</td>
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<td>• Viva Ma</td>
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<td>• Yi Mou Kho</td>
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<td>• Ya Hsin Wang</td>
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<tr>
<td>10:10 – 10:15</td>
<td>Description of the breakout topics</td>
<td>Brendon Kearney; Linda Mundy</td>
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<tr>
<td>10:15 – 10:45</td>
<td>BREAK (informal networking with tea and coffee)</td>
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<tr>
<td>10:45 – 12:15</td>
<td>Breakout Session 2 (go to your breakout room)</td>
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<tr>
<td>10:45 – 12:15</td>
<td>Breakout discussions in mixed groups</td>
<td>All</td>
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<tr>
<td>12:15 – 13:15</td>
<td>Lunch and informal networking; preparing reports from breakout session 2</td>
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<tr>
<td>13:15 – 15:00</td>
<td>Feedback from Breakout Session 2</td>
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<tr>
<td>13:15 – 13:45</td>
<td>Reports from breakout groups on session 2 (10 minutes per group)</td>
<td>Group rapporteurs</td>
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<tr>
<td>13:45 – 14:15</td>
<td>Plenary discussion</td>
<td>All</td>
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<tr>
<td>14:15 – 15:00</td>
<td>Take-home messages on topic</td>
<td>All</td>
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<tr>
<td>15:00- 15:30</td>
<td>BREAK (informal networking with tea and coffee)</td>
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<tr>
<td>15:30 – 16:45</td>
<td>Past and Future Asia Policy Forum related activities</td>
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<tr>
<td>15:30 – 16:00</td>
<td>Data availability and quality in Asia Pacific: Assessment and Implications for Horizon Scanning</td>
<td>Julie Van Bavel</td>
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<tr>
<td>16:00 – 16:30</td>
<td>HTA in Japan</td>
<td>Takashi Fukuda</td>
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<tr>
<td>16:30 – 16:45</td>
<td>Round up and summary</td>
<td>Brendon Kearney</td>
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<tr>
<td>16:45</td>
<td>Close of meeting</td>
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Meeting Information

Registration:
Delegate check-in will take place from 12:30 – 13:00 on November 6 and at 08:00 – 08:30 on November 7, outside of Ballroom 2 & 3 on the second floor.

Lunch will be served in Cafe Dulac restaurant, which is located on the first floor of the main building.

Social dinner location:
The Forest - House of Rustic Charm
259 Au Co, Tay Ho, Hanoi, Vietnam

Please note that due to difficult walking conditions, transportation has been arranged to and from the social dinner.

The group will meet in the hotel lobby at 18:15, and coaches to The Forest restaurant will depart promptly at 18:30. If you choose to make your own way to the restaurant you may.

After dinner, the coaches will depart The Forest restaurant every 30 minutes to return delegates to the Intercontinental Hanoi Westlake. The first coach will depart at 20:30, and the last coach will depart at 21:30. Please note if you wish to stay later than 21:30, you will be responsible for arranging your own transportation back to the hotel.
HTAi Asia Policy Forum 2019
Background Paper

Sustainability of healthcare systems in Asia: exploring the roles of horizon scanning and reassessment in the HTA landscape

Hanoi, Vietnam
November 2019
Executive summary

In order to support a sustainable health system, a balance needs to be found between the investment in new and innovative health technologies, and the reassessment of existing ones. A program for the identification of new health care technologies and clinical practices via horizon scanning run in parallel with a system of identifying existing practices as targets for reassessment may ensure that health systems can embrace innovation in a sustainable way.

Horizon scanning is a risk management tool that provides intelligence to policy-makers around the impact of the introduction of new, and potentially disruptive, health technologies. By gathering intelligence early, before a technology enters the health system, policy-makers are given forewarning in order to guide planning decisions, including not only financial capacity but infrastructure requirements such as physical structures and IT, workforce capability and training prerequisites. There is an appetite for more countries to embrace horizon scanning in the Asia region, with much to be learned from countries such as South Korea and Malaysia that have established, and Singapore who are in the midst of establishing, such systems.

In an ideal health system, existing clinical practices and technologies should be subject to ongoing review and continuous evaluation in order to identify ineffective, inefficient or costly clinical practices. Reassessment can improve quality and safety of care, and patient outcomes, in so doing, strengthen the sustainability of health systems. However, reassessment is not easy and is associated with many challenges, the first and foremost being the sense of loss of services experienced by clinicians and patients. Other challenges include a lack of political, clinical and administrative will, vested interests from multiple stakeholders and the sensitivities around removing services that may be associated with vulnerable patient groups such as children, cancer patients or the elderly. In addition, issues such as a lack of resources, data and evidence makes successful reassessment difficult. Developing communication and education strategies is the key to collaboratively bringing all stakeholders, including policy-makers, clinicians and patients, on any successful reassessment journey. Part of this strategy is to emphasise that reassessment is a prioritisation of services, providing safe, effective and most importantly, appropriate health care for all patients. Reassessment is not just about cost-savings.

In summary, running a system of reassessment of existing health care practices in parallel with investment decision-making may improve the quality and safety of care, patient outcomes, and help build organisational resilience, strengthening the sustainability of health systems.
Introduction

In 2018, the HTAi Asia Policy Forum (HAPF) discussed the challenges and pitfalls of different post-regulatory mechanisms that may improve or enable access to high-cost technologies in the Asia region. A recurrent theme during these discussions and previous HAPFs, was the need to identify tools to enable decision-makers to prioritise technologies to invest in for benefit packages and reassess existing technologies, whilst delivering value for money. Health policy makers in the region are tasked with the challenge of ensuring the long-term sustainability of healthcare services, juggling the fine balance of reducing health inequalities and facilitating universal access to innovative healthcare all with limited budgets. Globally, health budgets are affected by major drivers of rising health care costs that include an ageing population (declining fertility concomitant with increased longevity), the increased utilisation of health care alongside the increasing prevalence of chronic disease such as diabetes, and the drive to invest in new devices, diagnostic tests, medical procedures and pharmaceuticals. Investment in innovative health care technologies may; however, deliver enormous benefits to patients and, importantly, to healthcare systems\(^1\),\(^2\), with improved patient outcomes resulting in better patient flow through the system, which may result in reduced overall health system costs. In a resource-limited environment, governments recognise that tools such as health technology assessment (HTA) can assist them in the evidence-based decision-making process around priority setting, informing on the quality, safety and cost-effectiveness of new technologies. However, continuous investment in health innovation is not sustainable without a concurrent process for reassessing existing healthcare services. Whilst priority-setting for the investment of new healthcare technologies is of great importance, consideration must also be given to the reassessment of existing technologies that may have been superseded or those that are not as safe, effective or cost-effective as initially expected when used in real-world clinical practice. Continued investment without reassessment may lead to poorer health outcomes and wasted resources. Reducing expenditure on outmoded, low-value and potentially harmful health interventions can free up valuable resources to fund higher-value interventions elsewhere in the health system.\(^3\)

As such, the 2019 HAPF will examine the role that horizon scanning (HS) and reassessment can play in the sustainability of health systems in the Asia region. This paper will introduce some general concepts around the life cycle of health technologies and present case studies of horizon scanning and reassessment activity from the region. This discussion will be informed and guided by the key messages from the 2018 HTAi Global Policy Forum meeting on HS, and what they might mean for the Asia region. Some of the important key messages from that meeting included that HS systems:

- need to identify unmet needs in order to drive innovation;
- should focus on specific disease areas and/or care pathways; and
- need to include all relevant stakeholders at an early stage.\(^1\)

Attendees of the 2019 HAPF may also like to consider joining HTAi’s Disinvestment and Early Awareness Interest Group (DEA-IG), which is an international centre for sharing knowledge and expertise in methods for identification and prioritisation of emerging, new, obsolete or low-added-value technologies for HTA, and in the practical application of reassessment for health systems.

Life cycle of a health technology

Health systems usually consider the introduction or withdrawal of a health technology as a linear process: new technologies are introduced, and old technologies are made obsolete. More recently, the life cycle of a health technology has been depicted as an S-curve as described in Figure 1.

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\(^1\) The International Information Network on New and Emerging Health Technologies, also known as EuroScan

\(^2\) NICE = The National Institute for Health and Care Excellence

\(^3\) CADTH = Canadian Agency for Drugs and Technologies in Health
Emerging, innovative technologies may be detected by horizon scanning or early awareness systems before widespread use, with these technologies picked up and used by early adopters as they begin to slowly diffuse throughout the health system. Regulatory approval tends to occur at the inflection point of the technology curve, after which diffusion of the technology may increase exponentially. A full health technology assessment is usually only conducted when approaching maximum growth and diffusion of the technology, towards the top of the technology curve, when the effectiveness and cost-effectiveness evidence base has matured sufficiently to inform and formulate health policy. The curve then moves into a period of technology management, where stabilisation occurs and use of the technology plateaus, which may also be associated with a concomitant reduction in price. Established technologies may then become outdated, inefficient or no-longer-effective and use of the technology may wane, becoming obsolete (dotted line) offering the opportunity for reassessment.

In reality, the introduction of a new and innovative health technologies does not fit nicely into a linear or curved line. The overlapping S-curve model in Figure 2 may more accurately describe the reality of health care, where the introduction of new technologies is a continuous, overlapping process. Technologies reach their limit of diffusion and plateau, or worse, begin to reduce value and patient outcomes. At the same time, other new technologies are introduced into the system and the process begins again.

The challenge in healthcare is identifying the right time to invest in innovative and potentially disruptive technologies in order to value add to the existing health system, and to avoid using those technologies that may be outdated, inefficient or ineffective. A continual process of horizon scanning combined with a parallel process of reassessment using the tools of HTA is one way of achieving the overlapping S-curve technology life cycle.

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4 Health Technology Incorporation Esplanada dos Ministérios

5 Center of Healthcare Quality Assessment and Control, Russian Ministry for Health
Horizon Scanning

Horizon Scanning (HS) is a risk management tool that is not unique to healthcare and is used in many fields such as the environment, law, business, industry, defence, taxation and national security to reduce uncertainty, inform on future trends, enable planning to facilitate appropriate adoption, and in so doing, provide some element of future proofing. Essentially any sector employing an HS methodology wants to have advance warning and knowledge of any:

- Threats: What is coming over the horizon that could adversely affect your sector of interest?; and
- Opportunities: What does the intelligence gathered mean for your sector and what advantage could it deliver?  

In the case of healthcare, HS may deliver information and intelligence around both new and emerging, innovative health technologies, as well as identifying new uses for existing technologies. In addition, the scanning methodology of HS may provide a means of identifying targets for reassessment that may benefit patients and improve the delivery of health care. The greatest benefit of HS is that it delivers intelligence on potentially disruptive technologies to policy makers that may be used to guide future investments and assist in all aspects of health care planning that are not just confined to questions of financial capacity but consider infrastructure requirements (physical structures, IT requirements etc), workforce capability and training prerequisites. HS may also help to build organisational resilience.

Figure 2 The overlapping S curves of health technology’s life cycle in a health system (adapted from 5)
by assessing the implications of a new technology to ensure that health systems are able to embrace innovation in a sustainable way before the technology enters either the system. HS may prove to be an invaluable tool in providing information on risks and benefits as health systems move to embrace high-cost health technologies such as gene technology, cellular therapies and oncological pharmaceuticals, innovative technologies such as wearables, implants and E-health technologies\(^9\), and new models of health care delivery such as integrated care and home-based therapies.

In the early 1990s Banta and Gelijns recognised that the sustainability of health systems could not be maintained by simply reacting to developments in health care technologies, and that a proactive approach was needed to provide advance notice to policy makers to inform rational, evidenced-based decision-making. They recommended a systematic approach to the identification and early assessment of new health technologies, now known as early awareness and alert systems (EAA) or HS.\(^7\) European countries embraced this new methodology and in 1999 the EuroScan International Network was formed to provide a platform for information sharing via a web-based database, most of which is publicly available. This collaborative approach to the early assessment of innovative healthcare technologies reduces duplication of effort for members; however, it is reliant on agencies all participating equally. Although focussed heavily on European HTA agencies, with founding members coming from the Netherlands, Sweden and Denmark, other major contributing agencies included the UK’s National Horizon Scanning Centre, that conducted HS on behalf of NICE, and CADTH.\(^7\) EuroScan has expanded and strengthened its membership and now has 24 members (3 individual) who are committed to sharing information and providing advice and support to organisations considering setting up EAA systems.\(^7,11\) Relatively new members such as CONITEC from Brazil and Rosmedex from Russia, and established members NECA H-SIGHT from South Korea and MaHTAS from Malaysia may be able to offer valuable assistance, leadership and insights to countries in the Asia region wanting to develop an HS system.

The type of HS or EAA framework adopted is heavily dependent on the type of health system in place in each country, their financing and reimbursement policies, the degree of public subsidisation, the level of health insurance, the types of services offered, and the size and strength of the private sector. Not every country will, like Malaysia (see later case study), want to conduct HS across the board for all types of health care technologies. Some countries may choose to focus on highly innovative and high-cost technologies such as cellular and gene therapies that will be targeted by Singapore’s HS system (see later case study), whilst Chinese Taipei’s Center for Drug Evaluation (CDE) only focuses on HS for pharmaceuticals. Developing an HS system according to specific needs is nicely illustrated by research conducted in Australia, which unlike the majority of EuroScan members, conducts HS on all health technologies bar pharmaceuticals. Comparisons of the time taken for regulatory approval and public reimbursement for drugs identified by HS in countries with comparable health systems (UK and Canada) found that there was no difference in the time to market access between all three countries. This finding indicated that an EAA system for pharmaceuticals in Australia would neither improve access to new drugs nor better inform decision makers than the system already in place,\(^13\) underlining that the value of EAA activity is entirely dependent on the health system it is trying to support.\(^13\)

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9 A new technology can be defined as a drug, medical device or procedure that is newly approved by Health Sciences Authority (HSA) or is in the early adoption phase in the Singapore health care system. An emerging technology can be defined as a drug, medical device or procedure that is under clinical evaluation in trials (Phase II/III), or is expected to obtain regulatory approval in Singapore within 3 years. Both new and emerging technologies may refer to existing technologies that are being developed for a new indication.

10 Gene therapies treat diseases by modifying or introducing an individual’s genes. They are usually one-time treatments that result in a cure or life-long benefit, and target severe conditions with very limited treatment options. The cost of such therapies are hence correspondingly high.

11 From Choosing Wisely Australia: Q1 Do I really need this test, treatment or procedure? Q2: What are the risks? Q3 Are there simpler, safer options? Q4 What happens if I don’t do anything? Q5 What are the costs?
The actual process of HS will not be discussed in-depth in this background paper; however, the EuroScan International HS Network has a freely available toolkit that provides an overview of the HS methodology which can be adapted to form the basis for an HS system in any country’s health system. In addition, the HS handbook developed by MaHTAS is freely available on their website. Other good sources of HS information for agencies is the recent systematic review on HS methodologies by Hines et al (2019) and a report by PWC describing HS in the Asia region.

The basic steps involved in conducting HS may vary between countries and agencies; however, the essential elements remain the same and, briefly, consist of identification, filtration, prioritisation and assessment (Figure 3).

Agencies setting up an HS system first need to identify their primary stakeholders. These may include health department or hospital policy-makers, regulatory agencies, clinicians or patient groups. The next important step is to define the time horizon that the system will operate under. This may be a difficult concept and should be defined by the stakeholders needs. Some systems may want to identify technologies just before regulatory approval, whilst others will want to be informed about technologies just before they enter the health system.

Sources used to identify technologies will vary according to country and types of target (drugs, devices etc) and may include a mix of primary sources, such as direct contact with manufacturers or research institutes, or more commonly secondary sources such as the peer reviewed literature, medical media such as Medscape and clinicians. Sources used should be an iterative process over time, with adoption of new sources or rejection of old ones being informed by success rates in identifying relevant technologies, and changes in trends and the priorities of stakeholders. Agencies in the region should consider using sources that are pertinent and relevant to their own health system needs, and a regional information network may be helpful in sharing this type of information.

Importantly an agency’s framework should include scanning for groups of technologies in a clinical care pathway rather than just single technologies. This approach may offer more in the way of health system planning opportunities, especially for those diseases with a high burden of disease such as diabetes. Good examples of this include assessments conducted to identify technologies to treat chronic obstructive pulmonary disease and retinal disease. Depending on the disease, these types of horizon scans can map technologies across all stages: prevention, diagnosis, treatment and even rehabilitation. Technologies in each category can also be mapped to their stage of development: current, emerging (medium term < 3 years) and innovative (long term >3 years). See Figure 4 for an example of this mapping technique for stroke technologies. These types of scans can be kept “live” in that they can be added to as new technologies come to market, or when technologies move from one category to another e.g. moving from innovative to emerging.

In many cases, the filtration step can be conducted at the same time as identification, depending on the structure of the HS team, using simple questions such as: Is the technology new? Does it fit the time horizon? Is it an old technology for a new indication? Is it relevant to the health system in question? Does the technology have potential to impact on the healthcare system? What benefits to the health system does this new technology bring compared to current practice? This step requires a degree of familiarisation with the process and may benefit from a team approach at first, before being practised at the individual level.
Each HS system should formulate a series of prioritisation criteria that are designed to be applied to relevant technologies once filtration has been completed in order to prioritise the system’s capacity for assessment or evaluation. These criteria may be applied in-house by the HS team or by an expert panel that may consist of a mix of policy makers, clinicians and HTA experts. Again, these criteria will be specific to the HS system in question but may include technologies that address a high burden of disease (high morbidity or mortality), rarity of disease (few alternative treatment options available) or chronic disease. Other criteria may consider technologies that are high-cost, associated with safety concerns or ones that are rapidly diffusing in the health system and have not yet been assessed. It is important that the structure of the health system in question is considered with the formulation of prioritisation questions, especially factors such as the level of patient out-of-pocket payments required and the subsequent disparities in patient access to care that might result.

A key message from the 2018 GPF was that HS systems should identify unmet needs in order to drive innovation in technology development.1
Figure 4  Mapping of stroke technologies in the Australian health system
Once a technology has been prioritised, the type of assessment conducted, and the mode of dissemination, will again depend on the stakeholders needs. Assessments may be rapid (3-4 pages), brief (6-10 pages) or in-depth (up to 50 pages) depending on requirements and the extent of the evidence-base. Some agencies will prefer that assessments remain confidential and only disseminated to decision-makers, whilst others will be required to make assessments publicly available. The value of an information sharing network in the region may depend on a country’s requirements for dissemination, although it may be possible to share a redacted version (i.e. any financial/commercial-in-confidence matters) with other agencies in an effort to reduce duplication of effort.

To assess the level of horizon scanning activity in the region, a short survey of countries and agencies participating in the 2019 HAPF was conducted.

**Summary of the results from the agency horizon scanning survey**

A total of 14 public sector agency participants from 11 countries responded to the survey representing China (Beijing, Shanghai and Hong Kong), India, Indonesia, Japan, Malaysia, the Philippines, Singapore, South Korea, Chinese Taipei (2 agencies), Thailand and Vietnam. The main results of this survey are summarised in Table 1.

Of the 14 agencies, three have been conducting horizon scanning for at least 3-years (South Korea, Malaysia and Chinese Taipei- CDE ) and two are in the process of developing an HS system (Singapore and Shanghai). The development of Singapore's HS system will be detailed later in a case study. Shanghai gave no further details of the scope of its intended HS system. Eight of the remaining nine agencies are interested in developing an HS system, with only Hong Kong not interested in developing HS at this moment in time. Of the five agencies who are either currently conducting HS or developing an HS system, four were interested in forming an information sharing HS network similar to the EuroScan network. Five of the eight agencies interested in developing an HS capacity expressed an interest in forming such a network (3 agencies did not answer the question). Formation of such a network would not only provide a forum for information sharing, reducing duplication of effort, but may also provide a platform for collaboration with industry in the region.

Of the established HS systems, Malaysia has the most comprehensive, aiming to identify all types of new and emerging health care technologies that may impact on the Malaysian health system (see case study), whilst South Korea identifies new devices, diagnostics and medical procedures. Chinese Taipei’s CDE, as would be expected for an agency for drug evaluation, only identifies new pharmaceuticals. All three HS systems are primarily proactive, that is they actively identify new and emerging health technologies from a range of sources, rather than being reactive, where they would respond to requests and information provided by stakeholders such as clinicians. In addition, all three agencies currently identify single technologies rather than a range of technologies involved in a clinical care pathway. Interestingly, Malaysia and Chinese Taipei would consider using the HS methodology to identify potential disinvestment/reassessment targets.

The typical time horizon before technologies were thought to impact on the health system was more than 3-years, with only Chinese Taipei considering technologies 12 months away from health system entry. All three agencies used HS to inform policy-makers at the health department level, with South Korea and Malaysia also using it to inform hospital policy-makers, clinicians and patients. HS in Malaysia was also used to inform the medical device and pharmaceutical regulatory bodies. There was great variation between the agencies regarding HS sources with Malaysia having the most comprehensive range of primary and secondary sources (see Table 1).

There was a great deal of consistency between the three agencies when asked what criteria were used to prioritise identified technologies, with all agencies considering the burden of disease a priority, as well technologies that may be associated with any safety concerns. All agencies considered the potential impact of the technology on costs, whether that be increased costs or savings to the health
system, technologies that require a large capital outlay, or technologies that might require out-of-pocket payments for patients. Aligned with these concerns, all agencies prioritised those technologies that would have an impact on existing services that may require reorganisation or structural changes, have staff training requirements, be associated with learning curves or require quality assurance procedures. In addition, technologies that would impact on patient morbidity, mortality and quality of life were also a priority for all agencies. Identified technologies are prioritised either by the in-house HS team (South Korea and Chinese Taipei) or by a panel of clinical experts (Malaysia).

All three agencies produce reasonably in-depth assessment briefs that would typically consist of a description of the technology, regulatory information and include an assessment of the evidence on the safety and effectiveness of the new technology from several studies. Due to the newness of technologies it is highly unlikely that any cost-effectiveness analysis would be identified; however, a summary of basic costs including infrastructure and training requirements would be presented. Assessments briefs would typically be 8-12 pages long and would take 1-2 weeks to produce. Only Malaysia has a Rapid Brief product that is approximately 1-3 pages produced in 24-48 hours, which provide a brief overview of technology including costs and any evidence if available. These rapid briefs may not have sufficient evidence for investment decision making but they are important to alert policy makers to potential disruptive technologies that may have a great impact on the health system in the near future.

Table 1  Horizon scanning survey results from payer agencies

| Currently conducting horizon scanning (HS) | 3/14 (21.4%) |
| Not conducting HS but developing an HS system | 2/14 (14.3%) |
| Not conducting HS but interested in developing an HS system | 8/14 (57.1%) |
| Not conducting HS and not interested in developing an HS system | 1/14 (7.1%) |
| Interested in forming a network similar to EuroScan | Yes: 9/14 (64.3%)  
No: 2/14 (14.3%)  
Abstain: 3/14 (21.4%) |

Answers from the 3 established HS agencies

| How long has your HS system been active? | Chinese Taipei: 3 years  
South Korea: >3 years  
Malaysia: >3 years |
| What types of technologies is your HS system intended to identify? | Chinese Taipei : Drugs  
South Korea: Devices, diagnostics, medical procedures  
Malaysia: Drugs, devices, diagnostics, medical procedures, vaccines, gene or cellular technologies, public health programs |
| **Does your HS system identify single technologies or all technologies in a clinical care pathway?** | Chinese Taipei: Single technologies  
South Korea: Single technologies  
Malaysia: Single technologies |
|---|---|
| **Is your HS system proactive or reactive?** | Chinese Taipei: Proactive  
South Korea: Proactive  
Malaysia: Proactive |
| **Would you use HS methodology to identify potential disinvestment/reassessment targets?** | Chinese Taipei: Yes  
South Korea: No  
Malaysia: Yes |
| **What is the time horizon of your HS system?** | Chinese Taipei: 12 months  
South Korea: 1-3 years  
Malaysia: 1-3 years |
| **Technologies identified through HS will be used to inform** | Health department policy-makers: Chinese Taipei, South Korea, Malaysia  
Hospital policy-makers: South Korea, Malaysia  
Clinicians: South Korea, Malaysia  
Patients: South Korea, Malaysia  
Other (Medical device authority & National Pharmaceutical Regulatory Agency): Malaysia |
| **What sources are routinely scanned for technologies by your agency?** | **Primary sources**  
Commercial developers: Malaysia, Chinese Taipei  
Clinical trials registries: Malaysia, Chinese Taipei  
Patents: Nil  
**Secondary sources**  
Peer reviewed international journals: Malaysia, South Korea  
Regional (Asian) peer reviewed journals: Nil  
Google search alerts: Nil  
Medical media (e.g. Medscape): Malaysia  
Other HS agencies (e.g. CADTH or EuroScan): Malaysia  
Grey literature (e.g. newspapers): Malaysia  
Conference proceedings: Nil  
Commercial developers: Malaysia, South Korea  
Regulatory authorities: Malaysia, South Korea, Chinese Taipei  
Clinical experts: Malaysia |
<table>
<thead>
<tr>
<th>What criteria are used to prioritise identified technologies for assessment?</th>
<th>Based on health system priorities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burden of disease: Malaysia, South Korea, Chinese Taipei</td>
<td></td>
</tr>
<tr>
<td>Rarity of disease: South Korea</td>
<td></td>
</tr>
<tr>
<td>Associated morbidity or mortality: Malaysia, South Korea</td>
<td></td>
</tr>
<tr>
<td>Treatment options available (rare diseases): Malaysia, South Korea</td>
<td></td>
</tr>
<tr>
<td>Characteristics of disease (acute vs chronic): South Korea</td>
<td></td>
</tr>
<tr>
<td>Impact of technology on</td>
<td></td>
</tr>
<tr>
<td>Costs: Malaysia, South Korea, Chinese Taipei</td>
<td></td>
</tr>
<tr>
<td>Patients: Malaysia, South Korea, Chinese Taipei</td>
<td></td>
</tr>
<tr>
<td>Services and organisation: Malaysia, South Korea, Chinese Taipei</td>
<td></td>
</tr>
<tr>
<td>Ethical issues: Malaysia, South Korea, Chinese Taipei</td>
<td></td>
</tr>
<tr>
<td>Technology is</td>
<td></td>
</tr>
<tr>
<td>Rapidly diffusing &amp; has not be assessed: South Korea</td>
<td></td>
</tr>
<tr>
<td>Associated with safety concerns: Malaysia, South Korea, Chinese Taipei</td>
<td></td>
</tr>
<tr>
<td>New use of an existing technology: Malaysia, South Korea, Chinese Taipei</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Who applies these criteria?</th>
<th>HS team – in-house experts: South Korea, Chinese Taipei</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical expert panel: Malaysia</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What type of HS assessment does your agency produce?</th>
<th>Rapid brief: Malaysia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment brief: Malaysia, South Korea, Chinese Taipei</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How are your assessments disseminated?</th>
<th>Website: Malaysia, South Korea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newsletters (electronic or printed): Malaysia, South Korea</td>
<td></td>
</tr>
<tr>
<td>Social media (Twitter and Facebook): Malaysia</td>
<td></td>
</tr>
<tr>
<td>Word of mouth, seminars: Malaysia</td>
<td></td>
</tr>
<tr>
<td>Journal articles: South Korea</td>
<td></td>
</tr>
<tr>
<td>Other: Confidential brief for policy-makers: Chinese Taipei</td>
<td></td>
</tr>
</tbody>
</table>
Case studies

Case study 1: An established horizon scanning system: Malaysia

In 1995, the Ministry of Health (MoH) in Malaysia established its HTA unit, MaHTAS, in order to support coverage or purchasing decisions for health technologies using an evidence-based approach. The use of HTA was viewed as an effective mechanism to use for this purpose especially during a time of rapid economic growth which had resulted in an increased demand from clinicians for introducing new technologies into the health system. MaHTAS would receive ad hoc requests for rapid assessments from a number of sources including the MoH hospitals but also from other government agencies. In order to facilitate these requests, and with an increase in the development of innovative and high-cost technologies, the Medical Development Division proposed that an HS unit be developed within MaHTAS. In 2013 an exploratory survey was conducted on the needs and expectations of HS within the MoH and a pilot project was conducted in 2015, along with the development of an HS manual. The HS unit within MaHTAS has been operating at full strength since 2016, with five full time staff and one information specialist employed to conduct scanning and assessments.

The remit of the unit is to provide timely advice to the MoH on health technologies that have potential to impact on health, health services, and/or society. In so doing, this early warning system facilitates budgetary planning by enabling the appropriate implementation and/or adoption of new and innovative health technologies. Although policy-makers within the MoH are the primary stakeholders, others include hospital level decision makers, clinicians and patients as well as the government agencies of the Medical Device Authority and the National Pharmaceutical Regulatory Agency. The unit also has relationships with the Ministry of Health Innovation Unit and other government agencies related to innovation, as one of the more interesting roles of the HS unit is that it prioritises assessments and promotes awareness of local Malaysian healthcare innovations.

The range of assessments conducted within the MaHTAS HS unit is one of the broadest of all HS agencies, encompassing all types of technologies: pharmaceuticals, devices, diagnostics, surgical interventions, medical procedures, care pathways, community care, vaccines and public health interventions. Traditional and complementary medicines are also part of the unit’s remit; however, these assessments are rare due to the paucity of evidence. As such, the technology assessments produced address all levels of the health system: community and primary care, secondary (allied health), tertiary hospital care, as well as informing national, system-wide policy.

The HS unit is primarily proactive, identifying potential new technologies from a range of sources, as summarised in Table 1. In particular, the unit has found conferences and local media good sources for identifying local innovations. Sources have changed and evolved since the unit’s inception with a database being maintained that tracks the number of positive ‘hits’ identified from each source. The database is reviewed every year in order to refine the sources used. New sources are always being sought, especially local ones. In particular, the unit has tried to foster links with universities but have encountered a level of suspicion, especially regarding intellectual property. The unit also provides a forum for reactive assessments, responding to requests primarily from clinicians but also from industry. Links have also been fostered with industry via engagement with the Pharmaceutical and Medical Device Associations. This has enabled a two-way communication, with a mutual understanding that MaHTAS must follow MoH guidelines and operate at arm’s length to maintain the integrity of the unit whilst still enabling the exchange of information around new technologies.

Scanning is conducted on a continual, rolling basis, with each staff member assigned several sources that are scanned on a daily, weekly or monthly basis depending on publication of the source. Clinical trial registries are searched weekly, focusing on diseases that are a national priority. The HS unit then conducts an in-house meeting to apply the filtration criteria to identified technologies. Technologies must be innovative (preference to local), address a priority disease area (high burden of disease) and expect to be introduced into the market within 24 months i.e. before regulatory approval.
Technologies that meet these requirements are sent to a multi-disciplinary clinical expert panel to be prioritised for assessment. This panel meets three times per year, with meetings scheduled to coincide with HTA/CPG Council meetings, as all assessments need to be endorsed by the council prior to dissemination. The expert panel apply a number of prioritisation criteria and each technology receives a score depending on how many criteria are satisfied. Technologies prioritised for assessment must score at least 70%; however, it has been acknowledged that, at times, scoring is difficult when there is limited information about new technologies, especially around ethical and legal issues. Figure 5 describes the scoring system, with each criterion worth a maximum of 10 points. Technologies that are considered innovative and of interest but don’t quite meet the prioritisation threshold may be monitored for further information in 12 months, or when a clinical trial is expected to be finalised.

![Figure 5 Scoring system used by MaHTAS expert clinical panel to prioritise technologies](image)
When the HS unit first began operations, it aimed to produce eight assessments per year (produced 5, 9 and 8 HS Briefs in 2016, 2017, 2018 respectively) but with added operational capacity, this number is likely to increase in the future. A relatively new product, TechScans (rapid reviews) are produced, which are typically 4-6 pages and usually conducted in response to a specific request from a stakeholder about an emerging technology. Horizon scanning briefs (TechBrief), that are a more detailed assessment of approximately 6-20 pages in length are produced for prioritised technologies. More in-depth assessments are likely to be handled by the HTA team. All assessments follow a standard template as described in the HS manual, and these templates are reviewed regularly by the expert Committee to identify any strengths or weaknesses, ensuring they remain fit for purpose. Not all assessments currently go out for external review, but the HS unit plans to undertake this in the near future to ensure quality control. Industry is, however, given the opportunity to provide feedback on assessments within a two-week period. In addition, MaHTAS would also like to measure the impact of the HS assessments in a manner similar to that adopted for measuring impact of HTA reports. Currently MaHTAS seek feedback on the usefulness of the HS products from stakeholders and whether assessments have changed policy or clinical practice.

Assessments are all made publicly available and widely disseminated using a range of platforms including the MoH website, MOH Malaysia Web site, International Network for Health Technology Assessment (INAHTA) database, MaHTAS mobile app (myMaHTAS) for android and IOS application, the Academy of Medicine Malaysia, some Malaysian professional medical society web sites (CPGs only) and extracts of reports and news are highlighted in the biannual newsletter. Although MaHTAS products are accessible through all of these channels, creating awareness among the public on ineffective health technologies and more to empower them on informed decision making is still a major challenge. To facilitate communication with a wider audience including the public social media is being used to disseminate news, especially on the MaHTAS Facebook page.

On a final note, the HS unit are interested in developing their HS methodology in order to identify potential reassessment targets and a workshop was held recently to engage with clinicians to this end.

Recent assessments include those that have targeted diseases with a high burden of disease in Malaysia in addition to showing promising clinical impact:

- intranasal Esketamine
- low dose radiotherapy for early breast cancer post breast conserving surgery
- Brolucizumab for age-related macular degeneration (AMD)
- Entrectinib for NTRK fusion-positive, locally advanced or metastatic solid tumours; and metastatic ROS1-positive non-small cell lung cancer
- Signature by Natera for early detection of breast cancer relapse (on-going assessment)
- NeuVax Vaccine (Nelipepimut-S) (on-going assessment).

One of the biggest challenges setting up and maintaining the HS unit has been human resources: training and maintaining skilled staff when staff turnover has been high. In addition, getting "buy in" from stakeholders, especially regulators, was challenging at first but the relationship has improved over time.
Case study 2: A developing horizon scanning system: Singapore

Since 2015, Singapore’s Agency for Care Effectiveness (ACE) has been performing HTA for drugs and medical technologies to inform subsidy recommendations. The majority of ACE’s evaluation topics are selected from annual nominations from the public healthcare institutions (PHIs) and generally reflect established technologies already in routine clinical practice in the health system. As such, the current practice is reactive, with technologies that may have a large clinical, financial and organisational impact on the overall health care system only being assessed by ACE once they have begun to diffuse in the PHIs. To challenge this entrenched practice, ACE is currently developing an HS system that will operate in tandem to the existing HTA system to proactively identify and provide advance notice of new and emerging health care technologies that may have a significant impact on the Singapore health system before they diffuse. This may be in terms of budgetary and financial impact, infrastructure, workforce or training requirements in addition to safety or efficacy concerns associated with the use of the technology. It is expected that the new HS system will become fully operational by 2020 and it will primarily aim to inform policy makers at both the health care decision maker and hospital level, as well as clinicians. The system will target innovative, potentially disruptive high-cost technologies where there is considerable growth in clinical need and health care expenditure, and will initially focus on gene therapies. Once the HS system has been established and scanning processes are in place, other technologies will be added to the system over time. It is also hoped that the system will identify and assess all potential technologies in a clinical care pathway, rather than assessments of single technologies.

In establishing the new HS system, ACE conducted a systematic review of horizon scanning methodologies, and examined the HS systems of the key reference countries: Canada, Australia, the UK and South Korea in addition to EuroScan’s HS toolkit. Figure 6 describes the HS framework that was developed by ACE in alignment with international methodological standards.

![Figure 6 HS framework developed by ACE](image-url)
To identify potential targets, the HS system will initially scan a number of primary and secondary sources at regular intervals as outlined in table 2. In addition, local health care professionals and clinical experts will be consulted whenever relevant.

### Table 2 Proposed scanning sources and frequency for Singapore HS system

<table>
<thead>
<tr>
<th>Type of information source</th>
<th>Source</th>
<th>Scanning frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>Trial registries eg. clinicaltrials.gov</td>
<td>Bi-annually</td>
</tr>
<tr>
<td></td>
<td>Company websites</td>
<td>As required</td>
</tr>
<tr>
<td>Secondary</td>
<td>Regulatory authorities eg. FDA, EMA</td>
<td>Quarterly</td>
</tr>
<tr>
<td></td>
<td>Medical technology/ pharmaceutical news sources</td>
<td>Weekly</td>
</tr>
<tr>
<td></td>
<td>International and Asia region peer reviewed literature</td>
<td>Weekly</td>
</tr>
<tr>
<td></td>
<td>Conference proceedings</td>
<td>Annually</td>
</tr>
<tr>
<td>Tertiary</td>
<td>Other HS organisations eg. CADTH, NIHR Innovation Observatory, Health Technology Reference Group (Australia), EuroScan members</td>
<td>Quarterly</td>
</tr>
</tbody>
</table>

After identification, the filtration step will prioritise technologies that fit the ACE remit and are in the limits of the defined time horizon of technologies that are up to 3-years away from regulatory approval in Singapore, which is considered a sufficient lead-time to prepare the health system for the introduction of these high impact technologies.

As per Figure 6, a number of criteria will be used to prioritise the identified technologies for assessment. Topics will be prioritised by an in-house HS team as well as by relevant Committees such as the Ministry of Health’s Drug Advisory Committee, the Medical Technology Advisory Committee or the Rare Disease Expert Group, based on existing prioritisation criteria for the evaluation of drugs and medical technologies. In addition, consideration during prioritisation will be horizon scanning reports from reference agencies, including CADTH (Canada), Health Technology Reference Group (Australia), the NIHR Innovation Observatory (UK) and NICE Medtech Innovations (UK). Preference will be given to technologies that address significant health system priorities such as conditions with a high burden of disease, diseases with high levels of associated morbidity or mortality, as well as technologies that provide treatment options where few options exist e.g. for rare diseases. Other prioritisation criteria include the impact of the technology on:

- health system costs (e.g. potential savings, large capital costs, out-of-pocket payments for patients etc.); or
- patients (e.g. increased or decreased morbidity or mortality, quality of life); or
- services and organisations (e.g. reorganisation, structural changes, staff training requirements, learning curves, quality assurance procedures).

In addition to prioritisation, these committees will recommend the type of assessment required:

- **Monitor**: technologies still in an early phase of development with an immature evidence base should be monitored for more information in 12-24 months; or
- **HS report**: an assessment of more mature technologies encompassing safety, effectiveness, cost and impact. See Table 3 for an example of the fields of a typical report. The evidence base may consist of several studies, and the size of the report will typically be up to 10 pages; or
- **HTA evaluation**: either a full or expedited evaluation would be considered especially if the technology is close to regulatory approval in Singapore. These evaluations would be included in the relevant ACE HTA team’s work plan.

HS assessments will not be made publicly available but will be disseminated to the relevant national committee, Ministry of Health divisions or public health institutions.
In August 2019, ACE's HS team completed their first assessment.

Two main challenges were encountered by ACE when setting up their HS system in Singapore:

- A great deal of clinician engagement and expertise was required to prioritise identified technologies. Consultations with clinicians to understand local patient numbers, current treatment practices and the potential disruptive impact of new technologies to the healthcare system was required to inform prioritisation scores for most of the filtered technologies. Such information was not readily available.

- The scope of horizon scanning was not easily defined. While ACE received suggestions from MOH Advisory Committees on potential topics for horizon scanning, they were broad and covered a wide range, for example, precision medicine could include anything from companion diagnostics, genetic screening, artificial intelligence methods for imaging/sequencing, and autologous stem cell therapy.

The value of the HS outputs to key stakeholders remains to be seen at this point in time. There may be limited evidence for identified technologies for stakeholders to assess impact, and added to that are other uncertainties such as whether manufacturers would launch the technologies in the relatively small Singapore market.

**Table 3  Horizon scanning report template**

<table>
<thead>
<tr>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Background</strong></td>
</tr>
<tr>
<td>Description of disease / disease aetiology</td>
</tr>
<tr>
<td>Burden of disease</td>
</tr>
<tr>
<td>Clinical need</td>
</tr>
<tr>
<td><strong>Technology</strong></td>
</tr>
<tr>
<td>Description of technology</td>
</tr>
<tr>
<td>Novelty of technology</td>
</tr>
<tr>
<td><strong>Regulatory Status</strong></td>
</tr>
<tr>
<td>Details of local and overseas regulatory or development status</td>
</tr>
<tr>
<td>Fast track designations, if any</td>
</tr>
<tr>
<td>Brief details of any commercial arrangements</td>
</tr>
<tr>
<td><strong>Treatment Pathway</strong></td>
</tr>
<tr>
<td>Patient pathway</td>
</tr>
<tr>
<td>Current treatment options</td>
</tr>
<tr>
<td>Changes with new technology</td>
</tr>
<tr>
<td><strong>Available Evidence</strong></td>
</tr>
<tr>
<td>Safety and efficacy – summary of available trial information</td>
</tr>
<tr>
<td><strong>Cost</strong></td>
</tr>
<tr>
<td>Actual cost if available or estimated cost based on pricing information in other major markets</td>
</tr>
<tr>
<td><strong>Implementation</strong></td>
</tr>
<tr>
<td>Foreseeable issues with implementation in the local setting e.g. limited safety and efficacy data, cost and coverage of treatment, accessibility of treatment etc.</td>
</tr>
<tr>
<td><strong>Concurrent Developments</strong></td>
</tr>
<tr>
<td>Similar technologies in development</td>
</tr>
<tr>
<td><strong>References</strong></td>
</tr>
<tr>
<td>Horizon scan reports or guidance from other reference agencies</td>
</tr>
<tr>
<td>Other references</td>
</tr>
</tbody>
</table>
Reassessment

Tools such as HTA are needed to increase the efficiency of the health system, ensuring it provides value for money and is fit for purpose, enabling it to provide optimum care for all patients. In an ideal health system, existing clinical practices and technologies should be subject to ongoing review and continuous evaluation in order to identify instances of poorly coordinated care, duplication or gaps in service delivery, practices that encourage over-treatment or over-diagnosis, ineffective practices or systemic waste.\(^{20}\) In most health systems, some existing clinical practices have never undergone assessment, and any review of their performance tends to be slow, whilst in comparison, the investment in new technologies tends to occur rapidly. Harris et al (2017) summarised the many reasons, which are not always budgetary, why health technology reassessment (HTR) should be conducted (Table 4).\(^{20}\) Health systems should consider undertaking HTR activities in parallel with the uptake of new clinical practices and technologies in order to continue to offer value for money healthcare.\(^{21}\)

HTR has been previously referred to as ‘disinvestment’; however, this term is generally disliked by clinicians and consumers alike due to its negative connotations around the implied withdrawal or ‘taking away’ of a service believed to be beneficial.\(^{21}\) Reassessment is one of the preferred terms, along with prioritisation, optimisation or the appropriate use of health care, which have a more positive connotation.\(^{21}\) In essence, these terms can be defined as the evidence-based process of withdrawing health resources, partially or completely, from existing healthcare practices (procedures, devices, diagnostics, programs or pharmaceuticals) that are deemed to deliver no or low health gain for their cost, representing an inefficient allocation of health resources.\(^{22}\) However, it should be remembered that a multi-faceted approach is required for acceptance of HTR by all stakeholders. Assessment of the traditional metrics of HTA (safety, effectiveness and cost-effectiveness) is not sufficient during an HTR process, where a more holistic approach is required with consideration needed to be given to people, structures and values.\(^{21}\)

Reassessment was defined by Leggett and Noseworthy (2012) as ‘A structured, evidence-based assessment of the clinical, social, ethical & economic effects of a technology currently used in the health care system, to inform optimal use of that technology in comparison to its alternatives.’\(^{23}\)

### Table 4 Potential reasons for reassessment in the local healthcare setting\(^{22}\)

<table>
<thead>
<tr>
<th>External</th>
<th>Economic</th>
</tr>
</thead>
<tbody>
<tr>
<td>• To address political priorities</td>
<td>• To maximise benefits from resource use</td>
</tr>
<tr>
<td>• To meet legislative, regulatory or accreditation requirements and professional standards</td>
<td>• To improve efficiency</td>
</tr>
<tr>
<td>• To meet national recommendations</td>
<td>• To maintain quality without extra expenditure</td>
</tr>
<tr>
<td>• To address legal and ethical issues</td>
<td>• To remove a technology or clinical practice with unacceptable cost per QALY</td>
</tr>
<tr>
<td>• To be sensitive to the environment</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Financial</th>
<th>Patient care</th>
</tr>
</thead>
<tbody>
<tr>
<td>• To save money to meet budget cuts</td>
<td>• To improve patient health outcomes</td>
</tr>
<tr>
<td>• To find money to spend on something else</td>
<td>• To reduce patient harm</td>
</tr>
<tr>
<td>• To prioritise where money is spent</td>
<td>• To target populations or indications for best results</td>
</tr>
<tr>
<td>• To redistribute within or between budgets</td>
<td>• To improve patient flow and reduce waiting times</td>
</tr>
<tr>
<td>• To support investment in new technologies</td>
<td>• To improve patient satisfaction or reduce inconvenience</td>
</tr>
<tr>
<td>• To support continued investment</td>
<td>• To improve patient access and equity of service provision</td>
</tr>
<tr>
<td>• To get value for money</td>
<td>• To reduce unnecessary tests or treatment</td>
</tr>
</tbody>
</table>
Evidence based practice | Social judgement
---|---
- To ensure practice is consistent with current evidence
- Identify evidence of harm or lack of effect & remove technologies or clinical practices
- To update evidence-based guidelines and protocols | - To ensure public funds are spent wisely
- To reduce public funding on discretionary services eg some cosmetic procedures

Organisational
- To meet strategic goals and priorities or address specific problems
- To ensure sustainability
- To increase productivity
- To work within organisational capacity
- To work within staff capability
- To rationalise services eg provide orthopaedics at hospital A and oncology at hospital B
- To enable system redesign
- To reduce health service utilisation
- To reduce risk to staff, finances or reputation
- To reduce waste

Health technology, clinical practice or service
- To keep equipment up-to-date
- To remove obsolete or superseded technology
- To remove or restrict technologies or clinical practices that are harmful
- To remove or restrict technologies or clinical practices that have little or no value
- To replace technologies or clinical practices with alternatives of greater benefit
- To remove services that are not performing as intended
- To remove services that are not meeting the needs of the target population

Investment in new clinical practices and technologies can passively render existing ones obsolete through natural attrition, although new and old technologies often co-exist together in the system for some time. This passive approach may be achieved simply by education and disseminating information without the need for direct intervention from policy-makers, with clinicians often making the decision to stop using a technology because a better alternative is available.\textsuperscript{20} Natural attrition is often observed in surgical interventions, where incremental changes in technique are made, or old techniques are superseded by clearly more superior ones. In addition, medical devices may become obsolete due to industry’s ability to develop new iterations. Natural attrition should lead to improved patient outcomes, but it may be difficult to directly attribute savings, which is still the measurement most policy makers use to gauge the success of a program, to this process. The term reassessment does imply an explicit or active process that is attractive to policy makers as it is easier to attribute direct savings to, and therefore measure its value to the health system; however, this approach does run the risk of disenfranchising stakeholders.\textsuperscript{20, 21}

Challenges and issues of HTR
Although HTR may appear to be an obvious requirement for a health system, it is not an easy process, as unlike the investment in healthcare, there is no validated methodology or framework for health systems or HTA agencies to follow. Note: In 2017 a series of papers (11) were developed by the Sustainability in Health care by Allocating Resources Effectively (SHARE) program in Australia. These papers describe concepts, opportunities, methods and implications for evidence-based investment and reassessment in health technologies and clinical practices in a local healthcare setting. The papers in this series are targeted at clinicians, managers, policy makers, health service researchers and implementation scientists working in this context. Although describing the experience of a more mature health system in terms of universal health care, this series of papers may offer some valuable insights into the issues and challenges around HTR. The lack of methodology may in part explain the difficulty that the HTR process has in gaining traction and ‘buy in’ at all levels of the health system. An explicit, transparent process may be more acceptable to stakeholders rather than the \textit{ad hoc}, seemingly random process of HTR currently operating. Much research on methodology has been conducted with a recent review by Harris et al (2017) identifying 15 frameworks and models related to HTR, resource allocation and priority setting; however, most were in the concept phase and were, as such, untested.\textsuperscript{20}
Some of the other challenges and issues around successful HTR include:

- difficulties with identifying low-value services (see next paragraph);
- poor quality evidence (a lack of evidence does not equate to evidence of a lack of effectiveness)\(^{22, 24}\)

To overcome stakeholder resistance, HTR requires evidence of at least no risk, or of a benefit, when removing or limiting a technology’s use\(^{25}\);

- a lack of resources, in particular HTA practitioners;
- a lack of political, clinical and administrative will to evaluate established technologies\(^{26}\);
- some clinical practices and technologies may be associated with sensitivities (e.g. those used to care for children, cancer patients, and people at the end of life);
- multiple stakeholders;
- vested interests from manufacturers and some clinicians;
- a perceived lack of clinical autonomy with clinical advocates for healthcare practices who may be reluctant to change\(^{24}\);
- a lack of data, data linkage and post-market surveillance (e.g. registries for surgical procedures and medical devices). Good data is required to determine what is currently happening in clinical practice in order to identify potential HTR targets.\(^{21}\)

**Identifying potential HTR targets**

Various methods for identifying and prioritising reassessment opportunities have been described. Initiatives such as the US Choosing Wisely Program (also in Australia and Canada) and the NICE ‘Do-Not-Do’ list have been good starting points in identifying ineffective practices; however, many of these recommendations either describe clinical practices where evidence of effectiveness has always been lacking (i.e. x-rays for acute lower back pain or arthroscopy of the knee) or are simply guidelines that describe good clinical practice, such as the reducing the number of prescriptions for antibiotic prophylaxis. It should be noted; however, that it would be rare for programs such as these to identify a clinical practice that should be completely withdrawn, with most recommendations aimed at reducing widespread, inappropriate use whilst directing care to appropriate patients. One of the most important functions of these lists is not so much the guidance given to clinicians, but the encouragement and empowerment given to patients to ask questions about their care.\(^{11, 26}\) There have been few reports on the impact of these lists, with early research suggesting modest changes in clinician behaviour, with some clinical practices decreasing in use but with some actually increasing. The authors of this research concluded that additional interventions rather than just the provision of information may be required to affect change.\(^{27}\)

In practice, a multi-pronged approach is often needed, combining a top-down (with policy consisting of incentives and clear messages) and a bottom-up (involving empowering clinicians and patients) approach.

**Top-down approaches** (usually aimed at health system efficiencies) include identifying:

- high cost, high-volume clinical practices and technologies;
- low volume clinical practices;
- substitution opportunities; or
- clinical redesign and changed management looking at every step in the patient journey.

**Bottom-up approaches** include:

- timely and broad stakeholder engagement and consultation, especially involving clinicians is critically important to achieving a wider acceptance of the HTR process. A lack of early engagement of clinicians may result in little change in practice. Consumer/patient involvement and education is also important;
- an evidence-based assessment of quality and safety of clinical practices and technologies that
should also include an ethical dimension. Good evidence to support HTR may be lacking as there may have been little evidence supporting the initial investment. Registries may provide a means of providing ongoing monitoring and identification of high-risk medical devices or surgical procedures and could be used to identify potential targets;

- investment in new clinical practices and technologies as a means of driving HTR of existing clinical practices and technologies; or
- assessment of variations in clinical practice, e.g. regional or geographic variation, changes in practice over time, variations in patterns of use between clinicians, variations between institutions (e.g. public versus private).  

Scanning the peer-reviewed literature using an HS methodology may be a useful source of identifying potential HTR targets, with reports of outmoded practices or inappropriate care. However, this method may lack currency as it is associated with a significant publication lag-time. A more effective method may be to identify and foster ‘clinical champions’, key clinical groups or influential experts who can be pivotal in driving acceptance of change. In addition, at a local level, intelligence can be gathered and shared from clinicians who have attended conferences and may provide useful information regarding new technologies and practices gleaned from presentations by their peers.

Another method of identifying targets is through the use of clinical redesign methodology, which is primarily a service improvement tool, but it may have a secondary benefit of providing a means of reassessment by identifying and eliminating waste, resulting in improvements to patient flow. The redesign process tracks performance of an organisation or service and provides a framework for change and future decision making. Clinical redesign should be a systematic and methodical approach led by clinical staff, with the result being entirely patient-focused.

HTR can be driven by a combination of evidence, incentives and high-level support. Change is more likely to be accepted by both clinicians and consumers if the focus is firmly placed on quality and safety, or put simply, the appropriate care for the appropriate patient at the appropriate time. HTR decisions may be interpreted as a foregone or lost benefit for some, and for these individuals, an evidence-based decision alone will not drive change; therefore, incentives may need to be identified to affect clinically appropriate change.

Incentives can, but not always be financial. At a local level, incentives may be offered to clinicians in the form of trade-offs. There is anecdotal evidence that this so-called ‘carrot and stick’ approach works in some cases, with the best time to reassess the value of a health care practice being when investing in a new service or technology. That is, approval may only be granted for the investment in a new technology when a clear return on investment can be demonstrated via the identification of an HTR target that the new technology or service would replace. Following on from this process, another important incentive for effective HTR is to make the freed resources available to fund more appropriate services in the same program or hospital. Investment in new technology may drive HTR of an existing practice and deliver a return on investment. Released resources from the outmoded practice may then be more efficiently allocated by re-investing in clinical practices elsewhere in the health system, in so doing, optimising patient outcomes.
Case study 3: An experienced reassessment program: South Korea

The South Korean HTA agency NECA is one of the most experienced agencies in the region in terms of HTA, horizon scanning and health technology reassessment. The results of the HTR survey show that South Korea has an active HTR program that primarily focuses on diagnostics and medical procedures. Potential HTR targets were identified by several means including: stakeholder engagement, usually clinician driven; the investment in a new technology that then required a reassessment of an existing technology; the technology was a low volume clinical practice; or a variation in practice had been noted (e.g. regional or geographic variation, changes in practice over time, variations in patterns of use between clinicians, variations between institutions e.g. public versus private.)

Seo et al (2016) conducted a systematic review of HTR in several countries, including the United Kingdom, Australia, Canada, Spain, Sweden, Denmark, and the United States of America, in order to inform the HTR process in South Korea. Of particular interest was methodologies around the identification of candidate HTR technologies, priority setting, stakeholder involvement, support for reimbursement coverage, and strategies for the implementation of HTR.

The review identified several criteria that were used in these countries to identify potential HTR targets including the availability of new safety, effectiveness and cost-effectiveness evidence; variation in healthcare service utilisation and variation from clinical practice guidelines. Prioritisation of potential HTR targets used similar criteria as decision-making around the investment in new technologies including cost and the impact on the total healthcare budget, the benefit of the technology, the burden of disease and alternative options available. Once identified and prioritised, the review found that HTR methodology did not differ greatly from that of HTA. An important difference was that in order to overcome stakeholder resistance, HTR required a higher level of convincing evidence demonstrating at least no risk, or of a benefit, in removing or limiting access to the technology. Although acknowledged as being more difficult than assessments of new technologies, the review concluded that health system data was an invaluable source of real-world evidence that could be used to support HTR decision-making. The review also concluded that stakeholder involvement, especially the education of patients, was extremely important at all stages of the HTR process, and that the HTR decision-making process needs to be transparent and supported by robust evidence, around the decision-making process. A key development of HTR in South Korea has been recognising that a national registry for HTR should be created to investigate the influence of health technologies on health outcomes, as well as to analyse existing national health insurance claims data from the Health Insurance Review & Assessment Service and National Health Insurance in Korea. In so doing, evidence to support the implementation of HTR of existing technologies could be generated.

Two HTR pilot projects were initiated in South Korea, beginning in April 2014. These projects aimed to assess the feasibility of the introduction and implementation of an HTR program, to refine the objectives of the HTR for reimbursement coverage or (partial/comlete) disinvestment, and to set prioritisation criteria according to the objectives of the HTR program. A four-stage Korean HTR model was developed, including “identification”, “prioritisation”, “reassessment” and “decision” (see Figure 7). Criteria were developed to facilitate the practical implementation of HTR in South Korea:

- seven for “identification”: (i) safety, (ii) controversial efficacy, (iii) proposal from Department of Health, Korean Medical Association and patient related associations, (iv) new evidence on effectiveness, (v) significant changes in the utilisation frequency of technologies, (vi) changes in the cost-effectiveness of a technology, and (vii) variation in use (either regional or by provider).
- seven “prioritisation” criteria and weighted values: (i) safety, (ii) efficacy, (iii) volume on evidence, (iv) burden of disease, (v) potential impact of reassessment, (vi) utilisation of technologies and (vii) cost-effectiveness; and
- four “reassessment” criteria (i) safety, (ii) efficacy or effectiveness, (iii) efficiency or cost-effectiveness, and (iv) infrastructure of the healthcare system.
Once a technology has undergone reassessment the Health Technology Assessment Committee makes a decision based on the evidence and other criteria, in addition to advice from the HTR Specialised Committee. This reassessment model was first implemented on intestine capsule endoscopy and intra-disc steroid injections.25

To assess the level of HTR activity in the region, a short survey of countries and agencies participating in the 2019 HAPF was conducted.

**Summary of the results from the agency HTR survey**

All 13 agencies responded to the HTR survey with the results summarised in Table 5. Six (42.9%) agencies reported having some experience with the reassessment of a technology with a view to either partially, or completely, disinvest from it (Chinese Taipei (CDE), South Korea, Vietnam, India, Malaysia and China – Shanghai). Although Japan reported no experience with reassessment thus far, the new HTA system introduced in 2019 has an expectation that technologies may be reassessed in the future when new important clinical evidence is published in the peer-reviewed literature, or importantly, if costs of the technology are higher than expected once the technology is in routine clinical practice. Most agencies reported that they would be interested in forming a regional information sharing network around reassessment activities.

Of the six agencies with experience of HTR, Chinese Taipei (CDE) and South Korea reported that their agencies had an active HTR program. As expected, Chinese Taipei’s CDE routinely reassessed pharmaceuticals, whilst South Korea has conducted reassessments of diagnostics and medical procedures. Three countries (Vietnam, India and Malaysia) have had experience of reassessment on a more ad hoc basis, initiated either by clinician engagement or by noting a variation in clinical practice. As with their HS activities, Malaysia has wide ranging experience in reassessment covering pharmaceuticals, devices, vaccines and public health programs. The China – Shanghai agency conducted the reassessment of a pharmaceutical as a result of a clinical redesign program.

As might be expected, the majority of agencies had experience of clinician-driven identification of potential targets; however, it was interesting to note that five agencies identified reassessment targets due to a variation in practice. This practice may increase with the increasing use of data linkage and real-world data as discussed in previous HAPFs. Of note, three agencies conducted HTR of technologies that were identified as high-volume and high-cost.
Table 5  Reassessment survey results from payer agencies

| Has your agency ever reassessed a technology/practice and “disinvested” from it either partially or completely? | Yes: 6/14 (42.9%)  
No: 8/14 (57.1%) |
|---|---|
| Was this reassessment | Part of an active program of routine reassessment: Chinese Taipei (CDE), South Korea  
A one off, ad hoc reassessment: Chinese Taipei (CDE), Vietnam, India, Malaysia  
Part of a review of clinical practice guidelines  
As a result of a clinical redesign program: China – Shanghai |
| Was the technology a | Pharmaceutical: China – Shanghai, Chinese Taipei (CDE), Vietnam, Malaysia  
Device: Vietnam, Malaysia  
Diagnostic including precision medicine: South Korea  
Medical (surgical) procedure: India, South Korea  
Vaccine: Malaysia  
Public health programs: Malaysia  
Gene or cellular therapy |
| How was the technology identified as a reassessment target? | Through the peer reviewed literature  
Through horizon scanning activities  
Stakeholder engagement (i.e. a clinician driven): China-Shanghai, Chinese Taipei (CDE), Vietnam, Malaysia, South Korea  
Change in clinical practice guidelines: Chinese Taipei (CDE)  
Technology was high volume and high cost: Chinese Taipei (CDE), Vietnam, India  
Technology was a low volume clinical practice: South Korea  
Investment in a new technology required a reassessment of existing technology: China-Shanghai, South Korea  
A variation in practice had been noted, e.g. regional or geographic variation, changes in practice over time, variations in patterns of use between clinicians, variations between institutions (e.g. public versus private): China-Shanghai, Chinese Taipei (CDE), India, Malaysia, South Korea |
| How are the results of your reassessments disseminated? | Website: China-Shanghai, India, Malaysia  
Word of mouth, seminars, clinical forums: India, Malaysia, Vietnam  
Policy document: China-Shanghai, Malaysia, Vietnam, Chinese Taipei (CDE), South Korea  
Press release: South Korea  
Newsletters (electronic or printed): China-Shanghai, India, Malaysia  
RSS feeds  
Social media including Twitter and Facebook: Malaysia  
Journal articles: China-Shanghai, India, South Korea |
Potential talking points for during the Forum, especially during the breakout sessions, in relation to the challenges and issues of horizon scanning and reassessment.

- What do agencies hope to realise by establishing a framework for horizon scanning or reassessment?
  - Should reassessment be conducted on a structured or more ad hoc basis?
  - Can horizon scanning be conducted in parallel with reassessment in your agency?
- What are the common themes and key differences of HS or reassessment activities between agencies?
- What role can industry play in HS or reassessment activities in the region?
- How can existing HS and reassessment programs share information with agencies in the region?
  - Should a network like EuroScan be established to share information?
  - What would this network look like?
  - Is there a role for industry in this network?
- What are some of the key challenges you envisage when embarking on a program of reassessment?
  - Lack of HTA resources?
  - Difficulty identifying targets?
  - Access to data or lack of data?
  - Stakeholder “buy in”, especially clinicians? Political will? Limited commitment from policy-makers, funders and clinicians?
  - Inertia and failure to acknowledge that current practices aren’t working?
  - Lack of clear processes or incentives to sustain change?
Appendix 1 Horizon scanning and reassessment activity survey

Horizon scanning is a systematic methodology used for the identification and early assessment of new and emerging health technologies that may have a significant impact on health systems. By providing evidence-based advice on emerging technologies, horizon scanning is used to inform policy makers and health service organisations to assist in the managed introduction of new health technologies, including pharmaceuticals, medical practices and devices. Advance notice of an emerging technology can assist financing and planning decisions, ensure processes are put in place to support and monitor clinical development, and that technologies are evaluated before widespread diffusion. In so doing, horizon scanning supports the uptake of innovative, cost effective health technologies, whilst at the same time protecting patients from potentially ineffective or unsafe health technologies.

This part of the survey aims to capture the state-of-play of horizon scanning in the Asia region.

1. Which country does your agency represent?
   - □ China
   - □ Indonesia
   - □ South Korea
   - □ Beijing
   - □ Japan
   - □ Chinese Taipei
   - □ Shanghai
   - □ Malaysia
   - □ Thailand
   - □ Hong Kong
   - □ Philippines
   - □ Vietnam
   - □ India
   - □ Singapore

2. Is your agency (please choose the most appropriate option)
   - □ A: Currently conducting horizon scanning (HS)
   - □ B: Not currently conducting HS but currently developing an HS system
   - □ C: Not currently conducting HS but interested in developing an HS system
   - □ D: Not currently conducting HS and not interested in developing an HS system

3. For those agencies conducting/developing HS, would you be interested in forming an information sharing network in the Asia region similar to the EuroScan network?
   - □ Yes
   - □ No

Only continue with HS survey if you clicked A or B in Q2.

If you clicked C or D, please go to Reassessment survey Q17

4. If your agency has an HS system, how long has it been active for?
   - □ Less than 12 months
   - □ 1-3 years
   - □ >3 years

5. If your agency is developing an HS system, how long before it becomes fully operational?
   - □ Less than 12 months
   - □ 1-3 years
   - □ >3 years
6. If your agency is currently conducting HS, or developing an HS system, are you scanning/plan to scan for new and emerging (click all that apply)
   - Pharmaceuticals
   - Devices
   - Diagnostics including precision medicine
   - Medical (surgical) procedures
   - Vaccines
   - Gene or cellular therapies
   - Public health programs

7. Does your HS system/ will your HS system identify
   - Single technologies
   - All technologies in a clinical care pathway e.g all new pharmaceuticals for prostate cancer or new technologies for the treatment of stroke

8. Would you consider using your HS methodology to identify potential disinvestment/reassessment targets?
   - Yes
   - No

9. Is your HS system/will your HS system be
   - Proactive: where a range of sources are searched for information on new and emerging health technologies.
   - Reactive: where stakeholders, health professionals, developers and/or consumers to inform the system on new and emerging health technologies.

10. What is/will be the time horizon of your HS system (at what stage of development will technologies be identified)?
    - 6-12 months prior to regulatory approval
    - 12 months before the technology will enter the health system
    - 1-3 years before the technology will enter the health system
    - 3-5 years before the technology will enter the health system

11. Will technologies identified through HS be used to inform:
    - Policy-makers at the health department level
    - Policy-makers at the hospital level
    - Clinicians
    - Patients
    - Other (please specify)

12. What sources do you scan/plan to scan from to identify potential topics? Please click all that apply
    Primary sources such as
    - Commercial developers
    - Clinical trials registries
    - Patents
Secondary sources such as
- International English language peer reviewed journals (BMJ, Lancet, NEJM)
- Regional (Asian) peer reviewed journals
- Google search alerts
- Medical media - electronic newsletters (e.g. Medscape)
- Other HS agencies (e.g. CADTH) or network such as EuroScan
- Grey literature including TV news, newspapers
- Conference proceedings
- Commercial developers
- Regulatory authorities
- Clinical experts

13. What criteria are used/will be used to prioritise identified technologies for assessment?
Please tick all that apply
- Based on health system priorities
  - burden of disease
  - rarity of disease
  - associated morbidity or mortality
  - alternative treatment options available (rare diseases)
  - characteristics of disease (acute vs chronic)
- Impact of technology on
  - costs – increased costs or savings to the health system, large capital outlay, out-of-pocket payments for patients, direct and indirect costs for society
  - Patients - impact on morbidity, mortality, QoL, diagnosis, safety
  - Services and organisations - increased or decreased use, service reorganisation, structural changes, staff training requirements, learning curves, quality assurance procedures, safety concerns
- Ethical issues
- Technology is rapidly diffusing and has not be assessed
- Technology is associated with safety concerns
- New use of an existing technology

14. Who applies these criteria?
- Horizon scanning team – in-house experts
- Clinical expert panel
- Health service policy makers
- Patients or consumer groups

15. What type of HS assessment does your agency typically produce?
- Rapid brief: brief overview of technology, limited if any evidence but important to alert policy makers, typically 1-3 pages produced in 24-48 hours
- Assessment brief: more in-depth assessment covering safety, effectiveness, cost and impact, more mature evidence base may consist of several studies, typically 8-12 pages produced in 1-2 weeks
16. How do you disseminate your assessments?

☐ Website
☐ Newsletters (electronic or printed)
☐ RSS feeds
☐ Social media including Twitter and Facebook
☐ Word of mouth, seminars
☐ Journal articles
☐ Other (please specify)

This part of the survey aims to capture the state-of-play of reassessment in the Asia region.

Traditional HTA methodologies have become established practice when health systems seek to invest in and implement new clinical practices and technologies; however, reassessment methodologies are lacking. With increasing restraints on health system budgets, reassessment is viewed as a necessary part of the lifecycle of a technology. Reassessment of ineffective, inefficient or harmful clinical practices and technology presents opportunities to enhance patient and operator safety and improve quality of care that can also result in health system savings.

17. Has your agency ever reassessed a technology/practice and “disinvested” from it either partially or completely?

☐ Yes
☐ No

18. If NO to Q17, would you be interested in a regional information sharing network around reassessment?

☐ Yes
☐ No

19. If YES to Q17, was this reassessment (please click all that apply)

☐ part of an active program of routine reassessment
☐ a once off, ad hoc reassessment
☐ part of a review of clinical practice guidelines
☐ as a result of a clinical redesign program

20. If YES to Q17, was the technology a (please click all that apply)

☐ Pharmaceutical
☐ Device
☐ Diagnostic including precision medicine
☐ Medical (surgical) procedure
☐ Vaccine
☐ Public health programs
☐ Gene or cellular therapy
21. If yes to Q17, how was the technology identified as a potential reassessment target? (please click all that apply)

- through the peer reviewed literature
- through horizon scanning activities
- stakeholder engagement (i.e. a clinician driven)
- change in clinical practice guidelines
- an investment in a new technology required a reassessment of existing technology
- a variation in practice had been noted, e.g. regional or geographic variation, changes in practice over time, variations in patterns of use between clinicians, variations between institutions (e.g. public versus private)
- technology was high volume and high cost
- technology was a low volume clinical practice

22. If YES to Q17, how do you disseminate your reassessments? (please click all that apply)

- Website
- Word of mouth, seminars, clinical forums
- Policy document
- Press release
- Newsletters (electronic or printed)
- RSS feeds
- Social media including Twitter and Facebook
- Journal articles
- Other (please specify)
References


12. Mundy, L., Merlin, T.& Hillier, J. E. Early alert systems for new pharmaceuticals - do they have an impact on pharmaceutical/public reimbursement decisions? A cross-national comparison. Health Technology Assessment international (HTAi); Singapore2009.


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Professor Kearney presently works as a Clinical Professor in the Faculty of Medicine, University of Adelaide, practicing as a Consultant in the Haematology Unit of the Royal Adelaide Hospital (RAH) Cancer Service with a private practice based at the Royal Adelaide Hospital. He also has management responsibilities for pathology services at the RAH.

Professor Kearney has chaired numerous committees including the Health Policy Advisory Committee on Technology (HealthPACT) since 2003. For 10 years, he was the Deputy Chairman of the Medical Services Advisory Committee (MSAC), Australia’s Health Technology Assessment committee for the assessment and recommendations on procedures, devices and diagnostics. This involved the establishment of policies and systems for HTA assessment linked directly to reimbursement decisions. He has also served on the National Health and Medical Research Council for twelve years and has held various senior policy and management roles in the Australian Health System. He is a past-Chair and current Board member of EuroScan International and is a current Board member of HTAsiaLink.

Professor Kearney has been awarded the Sydney Sax medal for services to health and an Order of Australia for contribution to emergency services and health research.

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With a B.Sc. from the University of Adelaide, majoring in immunology, microbiology and biochemistry, Linda started her career as a clinical researcher in the fields of obstetrics and gynecology, physiology and HIV infection.

Seeking a change in direction, Linda completed her M.P.H whilst working at Adelaide Health Technology Assessment (AHTA), conducting systematic reviews on behalf of MASC. Until recently, Linda was Manager of HealthPACT, the Horizon Scanning agency for Australia and New Zealand. She was the leading researcher and methodological expert in Horizon Scanning in the Australian public hospital context, for new and innovative healthcare technologies. In addition, Linda focuses on the identification of disinvestment opportunities. Linda is now the MSAC Applications Officer for the Royal College of Pathologists of Australia.
ASIA POLICY FORUM MEMBERS

Dr. Jeonghoon Ahn
Associate Professor
Ewha Women's University
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Dr. Jeonghoon Ahn is an associate professor at the Ewha Women's University and an adjunct fellow at the National Evidence-based Healthcare Collaborating Agency (NECA), in Seoul, South Korea. His main research area is economic evaluation of health technologies. Before joining the Ewha Women's University in 2016, Dr. Ahn was a senior research fellow and executive director at the NECA. He was an assistant professor of pharmaceutical economics and policy at the University of Southern California (USC) before joining the NECA. He received his BA in International Economics (1992) and MA in Economics (1994), with an emphasis on econometrics, from the Seoul National University in Korea, and PhD in Economics (2000), with an emphasis on Health Econometrics, from the USC. From 2000 to 2002, he was the DIA postdoctoral fellow on pharmacoeconomics and outcomes research at the University of Maryland's School of Pharmacy. Dr. Ahn is currently serving on the Drug Reimbursement Evaluation Committee of the Health Insurance Review and Assessment Agency (HIRA). He has served in many professional organizations, including as a board director for HTAi and INAHTA. Dr. Ahn also contributed to forming a regional Health Technology Assessment agency network, HTAsiaLink, along with other experts in the region.

Mr. Perry Bridger
Vice President, Global Value, Payer Access and Public Policy
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Perry Bridger is Vice President, Global Value, Payer Access and Public Policy at Edwards Lifesciences.

Perry oversees the global value, payer access and public policy work across Edwards' portfolio of technologies and leads the strategy for the company's Transcatheter Aortic Heart Valve (TAVR) market access, health economics, and reimbursement initiatives.

Prior to joining Edwards, he was Senior Vice President and Director of the Reimbursement Practice at Avalere Health, a leading strategic advisory company in the healthcare field. Previously, he served as a Health Policy Analyst at The Centers for Medicare & Medicaid Services and has extensive experience in U.S. Federal healthcare policy and medical technology evaluation. He holds an undergraduate degree in history from Brandeis University, and a Master's in Health Policy and Management from the Johns Hopkins Bloomberg School of Public Health.
Mr. Silver Chen
Senior Director, EM Asia, Patient & Health Impact
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Mr. Silver Chen has been Senior Director, Regional Health & Value Lead – EM Asia at Pfizer since 2013, based in HK. He is a member of the Pfizer regional leadership team and responsible for providing strategic and execution support to in-country market access operations in the Asia region. Mr. Chen has 19 years of pharmaceutical experience in Market Access, Public Affairs and laboratory science.

Mr. Chen joined Pfizer Canada in 2003 and has held positions of increasing responsibility in Canada, USA and HK. As Manager, Reimbursement Strategy, he led the development and implementation of Market Access plans for new product launches. He then managed Pfizer’s interactions with the Ontario provincial government and key private payers to gain, enhance and protect access to Pfizer products. In 2010, Silver moved to Pfizer’s global headquarters in NY to take on positions in Market Access and Public Affairs supporting the Asia Pacific region.

Prior to joining Pfizer, Mr. Chen was a chemist and manager in analytical laboratories in Beijing and California. He obtained his B.S. in Chemistry from Peking University (China), MSc. in Biochemistry from Auburn University (USA) and MBA from University of Toronto (Canada).

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Professor Yingyao Chen is professor of Health Services at the School of Public Health at Fudan University (FUSPH), Director of the Key Lab of Health Technology Assessment (National Health Commission) at Fudan University, and Director of WHO Collaborating Center for Health Technology Assessment and Management. He is also Associate Dean of the School of Public Health, responsible for international collaborations.

He received his Bachelor of Medicine at Shanghai Medical University (1991), his MPH at Shanghai Medical University (1997), and his PhD in Management at Fudan University (2006).

His academic interests focus on health technology assessment, health policy, health economics and hospital management. He was a principal investigator of several projects funded by the World Health Organization, World Bank, China Medical Board, Ministry of Health, Ministry of Science and Technology, National Natural Science Foundation of China, and provincial health authorities. He has published 150 papers in Chinese or English, of which 140 in Chinese and 10 in English are with first authorship and corresponding authorship. He is the editor-in-chief of Health Services Evaluation and Disease Burdens of Main Birth Defects and Economic Evaluation of Their Preventive Strategies in China.
Dr. Lesley Chim is Director of Market Access, APAC, at BioMarin Pharmaceutical Inc. Lesley has a background in pharmacy and over 20 years of industry experience. Prior to joining the pharmaceutical industry, she worked as a pharmacist in both community and hospital pharmacy. Lesley started her career in the pharmaceutical industry as a regulatory affairs associate and worked in a variety of roles including clinical research and medical information before making a full transition into health economics.

She holds a Bachelor of Pharmacy, a Master of Public Health (Hons), a Doctor of Philosophy (Medicine) from the University of Sydney, Australia, and a Master of Commerce from the University of New South Wales, Australia.

Songhee Cho is a researcher at the National Evidence-based Healthcare Collaborating Agency (NECA), Seoul, South Korea. Her main research area in NECA is health technology assessment as well as reassessment. She received her B.S. in Biology from the State University of New York at Albany and MPH in Public Health from the University of Southern California.

Dr. Insun Choi is the director of office of Policy Research for Future Healthcare in the National Evidence-based Healthcare Collaborating Agency (NECA), the Health Technology Assessment (HTA) agency in Korea. Dr. Choi was a research professor in the school of Pharmacy, Rutgers University, and worked as a research professor at Chungang University. He has contributed to the development of statistics and pharmacoeconomics in Korea over the last 15 years.
Ms. Elizabeth Cobbs
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Elizabeth J. Cobbs, PhD, serves as AVP, Regional team for the Center for Observational and Real World Evidence (CORE). In this capacity, Ms. Cobbs is responsible for building and integrating the support of CORE into the strategic planning for the Asia Pacific, Latin America and the Mid-Europe, Middle East and Africa regions. Ms. Cobbs has been working for Merck for 18 years in global positions in both Policy and Access. Ms. Cobbs built and ran MSD’s Health Policy & Access in Japan from 2005-2011 where she managed the company’s relationships with the Ministry of Health, Labour and Welfare (MHLW) and the Parliament. In 2011, Ms. Cobbs moved to Europe as the Regional Market Access Lead (RMAL), working on access strategies to ensure that the data generated in support of product value fulfilled the diverse needs of payers across the region. After returning to the USA in 2014, Ms. Cobbs joined CORE, taking up her current responsibilities in 2018.

Mr. Jim Crompton
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Mr. Jim Crompton is a strategic specialist at Janssen, Asia Pacific with over a decade’s experience in health policy development, negotiation and implementation, with a focus on value assessment. Jim’s initial experience in health system design came at Medicines Australia, where the organisation partnered with Government to implement a series of reforms to the Pharmaceutical Benefits Scheme (PBS). This included structural changes to the formulary, the introduction of price disclosure, parallel regulatory and reimbursement submission pathways, and initiation of managed entry schemes. During this time, Jim was also the pharmaceutical industry’s representative of the technical sub-committees of Australia’s HTA agency the Pharmaceutical Benefits Advisory Committee.

Jim joined Janssen Australia’s market access team in 2012, working to secure subsidised access in disease areas such as cancer, diabetes, inflammatory disease and hepatitis C, while continuing to support subsequent PBS reforms. Subsequently, Jim assisted medical device sector reforms negotiations within Australia’s private health insurance system. More recently, he has supported industry’s engagement on the implementation of HTA In Japan.

Jim holds an Economics degree from the Australian National University.
Dr. Huong Lan Dao
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Dr. Dao Lan Huong is a senior health system specialist in the World Bank’s East Asia and Pacific Human Development Unit, World Bank office in Hanoi, Vietnam. She has more than 20 years experience working on the health system, health financing, and service delivery in Vietnam. While working with the World Bank, she has managed several lending projects on health system support and provided technical assistance to the Ministry of Health on health insurance, service delivery, etc. Prior to joining the World Bank, she was a researcher of the Health Strategy and Policy Institute in the Ministry of Health of Vietnam. She graduated as a medical doctor from Hanoi Medical University, Vietnam, and holds a PhD in public health from Umea International School, Umea University, Sweden.

Mr. Simpson Emmanuel
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Simpson Emmanuel joined Roche in September 2014 as Director of Social Impact and Access Innovations in India. He transitioned into his new role in January 2019. His current responsibilities include supporting above brand access needs of 17 affiliates by being a catalyst in their cultural transformation journey and new ways of working, supporting implementation of global and affiliate access projects and sparking innovation in affiliates through pilot projects. He has worked in diverse therapy areas (Oncology, HIV, Hepatitis, Infectious diseases, Critical care and hospital products, Diabetes and Osteoporosis). He is also a two-time winner of the Marketing Excellence award instituted by OPPI (Organization of Pharmaceutical Producers of India). Simpson has a post graduate diploma in health economics from the University of York, UK. His other educational qualifications include a PGDBA (equivalent MBA) in Marketing & Systems and a Bachelor’s degree in Physics.
Alexo Esperato is Lead, Health Systems Design, at the Delhi office of the Bill and Melinda Gates Foundation. Alexo’s professional experience spans healthcare delivery and financing. Currently in India, Alexo is leading various technical assistance grants, with emphasis on health insurance implementation, primary care, health technology assessment and health systems research. Prior to India, Alexo consulted extensively with the World Bank on healthcare delivery and financing in Latin America and the Middle East. Prior to this, Alexo worked at the World Health Organization, where he managed quality of healthcare programs across Latin America and the Caribbean. Alexo has been also involved in various analytical studies, including economic and impact evaluations of health interventions, some of which have been published in peer-reviewed journals. Prior to obtaining his PhD in health systems (Johns Hopkins University), he trained in both economics (BA) and public policy (Master’s Degree).

Takashi Fukuda is Director of the Center for Outcomes Research and Economic Evaluation for Health (CORE2-Health; C2H) at the National Institute of Public Health, Japan.

He received his PhD from the Graduate School of Medicine, University of Tokyo, majoring in health sciences. After his career as Assistant Professor of Health Administration at the Graduate School of Medicine, the University of Tokyo, from 1995-2000, he worked as Associate Professor of Pharmacoeconomics at the Graduate School of Pharmaceutical Sciences, University of Tokyo from 2001-2006. In 2007, as the School of Public Health was opened, he became Associate Professor of the Department of Health Economics and Epidemiology Research, the School of Public Health, University of Tokyo. Since November, 2011, he has worked for the National Institute of Public Health, which is the governmental research institute. He became Director of the Department of Health and Welfare Services in 2015. As the new Center for Outcomes Research and Economic Evaluation for Health was opened in 2018, he was appointed as its first director. His major research areas are health care economics, health care administration, and pharmacoeconomics.
Anne Julienne “Yen” Genuino is a Senior Health Program Officer at the Health Technology Assessment (HTA) Unit of the Department of Health (DOH) in the Philippines. After graduating with a BS in Pharmacy from the University of the Philippines, she joined the DOH – Pharmaceutical Division in 2011 where she worked as part of the Philippine National Formulary System secretariat. This led to opportunities to participate in international projects with Thailand Health Intervention and Technology Assessment Program where she developed her interest in the area of HTA. From 2014 to 2016, Yen honed her skills in health policy development and program implementation as she was assigned to facilitate the establishment of a multi-sectoral initiative to combat antimicrobial resistance (AMR). As the national program manager and lead secretariat, she worked with different government agencies and international partners. From 2017 to 2018, Yen pursued her interest in HTA through further studies at Mahidol University in Thailand MSc program in HTA under a scholarship grant from the International Decision Support Initiative (iDSI). With the passing of the UHC Act in the Philippines, which mandates the institutionalization of HTA, Yen is now back at the DOH to contribute to this new and challenging agenda.

Alicia Granados is an MD, PhD in PH and certified specialist in respiratory medicine. She serves at Sanofi as Head of Global Health Technology Assessment (HTA) Scientific Strategy. She has a clinical and academic background as researcher and associate professor at the School of Medicine of University of Barcelona. She is an international specialist in health technology assessment (HTA) with 30 years experience in health care, public and private practices, methods and policy development, at the national and international level, including as regional advisor of WHO and the pharmaceutical industry. Founding President of HTAi, INAHTA founder and former President of Autonomous University of Barcelona's Board of Trustees, she is currently a member of Catalan Department of Health's Advisory Board, Government of Catalunya. Dr Granados has more than 60 scientific and health care policy papers published in international peer-reviewed journals.
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Adrian Griffin is Vice President of HTA & Reimbursement Policy at Johnson & Johnson. He has been involved in the fields of health economics, outcomes research and reimbursement policy within the healthcare industry for over 20 years, with experience across the pharmaceutical, medical device and diagnostic sectors. Adrian currently serves on one of the NICE Technology Appraisal Committees (where he has been a committee member for 16 years) and served on the Board of Directors for the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) between 2013 and 2015.

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Iñaki Gutiérrez-Ibarluzea has a B.Sc., M.Sc. and a Doctor in Sciences (NeuroScience) from the University of the Basque Country; a Master in Epidemiology from the Andalusian School of Public Health; and a Master in Bioethics from the University Ramon Llul. He is the current director of Innovation management and organisation of the Basque Foundation for Health Research and Innovation. He was the coordinator of the horizon scanning on the life cycle of health technologies of Osteba, Basque Office for Health Technology Assessment.

He is currently the President of HTAi (2019-2021) and has been the Vicechair of EuroScan since 2017. Iñaki has advised different HTA initiatives in Argentina, Brazil, Colombia, Costa Rica, Mexico, South Africa, Tunisia, Norway, Israel, EEUU, Malaysia, Italy, and WHO-EMRO-WPRO and PAHO regions, and advised on WHO medical devices. He has been the principal researcher of national and EU funded projects, he is associate editor of Frontiers in Pharmacology and HiNT, and member of the editorial board of IJTAHC. He has written more than 60 articles in peer-reviewed journals and more than 100 HTA reports.
Dr. Li Ying (Grace) Huang

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Dr. Li Ying (Grace) Huang is a director of the Division of Health Technology Assessment, Center for Drug Evaluation, Taiwan (CDE/HTA). Before joining CDE/HTA in 2008, she worked for approximately 10 years as a clinical pharmacist in a leadership role in the department of pharmacy in one of the major medical centers in Taipei. Her current research focuses on comparative effectiveness of new drugs, mixed treatment comparison methods, patient-involved HTA and therapeutic inertia among adult DM patients in Taiwan. From 2016 to 2018, she served on the International Network of Agencies for Health Technology Assessment (INAHTA) board of directors. Since then, she has been involved in INAHTA activities. She has also worked with the HTAi Interest Group for Patient and Citizen Involvement in HTA (PCIG) and INAHTA Patient Involvement and was invited to the HTAi Asia Policy Forum in 2018 to share her experience in Taiwan's HTA. Dr. Huang currently serves on the International Board of Directors for INAHTA and, in the role of director, she hopes to share her experience in CDE/HTA with other developing countries.

Mr. Keiji Iwashita
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Keiji Iwashita has worked at Takeda Pharmaceutical Company for 31 years and is now the Vice President of Healthcare Policy and Access for the Japan Pharma Business Unit. He graduated from Kyushu University in economics in 1988 and joined Takeda the same year. Since joining the company, he has held various positions, including senior manager in the Administrative Management Department. He was a member of the National Policy Unit for the Government of Japan from 2009 to 2011, and he also served as assistant to the chairman of the Japan Association of Corporate Executives from 2011 to 2015.

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James Jarrett is a health economist with 15 years of experience working in academia, consultancy, the public sector and the biotechnology sector. James has a special interest in rare diseases and methodologies for evidence synthesis of trial and real-world evidence for HTA purposes. In addition, James has practical experience of implementing managed access agreements in multiple countries.
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Masafumi Kato is a manager in Healthcare Policy Group in Takeda Pharmaceutical Company Limited in Japan. He joined Takeda in April 2005. Mr. Kato had worked as a biostatistician in research and development department for over 10 years. With his abundant knowledge and experience, he is currently in charge of the cost-effectiveness evaluation in the drug pricing system in Japan. Mr. Kato holds a Master’s degree in statistics.

Dr. Nguyen Khanh Phuong
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Dr. Nguyen Khanh Phuong is currently head of the Health Economic Department under the Health Strategy and Policy Institute at the Ministry of Health. She has served in the institute for 20 years and devoted her entire career to the healthcare sector in Vietnam.

Dr. Phuong is viewed as a leading health economist with more than 20 years experience in health financing, health economic and health system reform in Vietnam. She also has a strong background in policy evaluation and monitoring, research proposal design and development, provider payment methods, hospital services cost, health technology assessment and project evaluation.

Dr. Nguyen Khanh Phuong has extensive experience in the healthcare sector, having held many positions such as coordinator, senior technical officer, principal investigator and national consultant. She has involved in several studies which provided evidence for developing important health policies such as health insurance and health financing reform. She is currently a member of HTAsiaLink Scientific Board, HTAi Asia Policy Forum Organizing Committee, and Joint Learning Network.

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Levina Chandra Khoe is a lecturer at Universitas Indonesia as well as part of the HTA technical staff since 2014. She joined the PIC team at Universitas Indonesia in 2014. Her research interest is health technology assessment, health economics, community health and global health.
### Mr. Yi Mou Ko

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Mr. Yi Mou Ko has been chairman of the Psoriasis Association of Taiwan and advocate for patients’ rights for many years. In addition, he is the chief secretary, Asia Pacific Region for IFPA (International Federation of Psoriasis Associations). Mr. Ko is also the patient representative of the PBRS committee in medical device as well as a committee member of the medical device committee in the Ministry of Health and Welfare. Prior to his current positions, he was also deputy Committee Member, National Health Insurance Committee, Ministry of Health and Welfare and National Health Insurance Deputy Committee Representative, Medical Service Payment of PBRS.

### Mr. Daniel Lalonde

HTAi Executive Director  
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Daniel Lalonde brings a rich background in health leadership, clinical information systems (CIS), and technology commercialization to HTAi. He is a native Edmontonian and is passionate about transforming healthcare through innovative processes and technological advancements. Daniel has extensive expertise with advisory services, electronic health records and physician engagement. He is also a licensed critical care paramedic who has served in various field and flight capacities across Canada and abroad.

Daniel has led complex, high-value health system advancements throughout North America, Europe and the Middle East and understands the diverse political, cultural and economic drivers that underpin them. Within these roles, Daniel has directed numerous health technology assessments, either to assist with funding determinations for early stage innovations or to guide organizations seeking to investigate and differentiate products for consideration within their portfolios. Prior to joining HTAi, Daniel provided oversight for Hoag Health System’s CIS Department in Orange County, California, where he led a large clinical and IT team to deliver on the Board’s vision for an enterprise-wide paperless environment.
Sang-Soo (SS) Lee, Ph.D., MBA, is Corporate Affairs Director for Medtronic Korea and Co-Chair for the Medtronic Asia Pacific Reimbursement Leadership Council. SS manages health policy, reimbursement, health economics, and health technology assessment.

Dr. Lee has held multiple positions at various organizations, such as a member of the Board of Directors at Korea Association of Health Technology Assessment (KAHTA); chair of the reimbursement policy committee at Korea Medical Devices Industry Association (KMDIA); co-chair of the medical device committee at the American Chamber of Commerce (AmCham) in Korea; and adjunct professor at the Graduate School for Medical Device Management and Research, SAIHST(Samsung Advanced Institute for Health Science & Technology), Sung Kyun Kwan University.

Pattara Leelahavarong, a Program Leader of HITAP, graduated with a Ph.D. in health economics from the University of Glasgow, United Kingdom, in 2018; a Master’s degree of science in pharmacy (pharmacy administration); and a Bachelor’s degree of science in pharmacy from Mahidol University. She has worked for the Health Intervention and Technology Assessment Program (HITAP) as a researcher since 2008 in the area of health technology assessment (HTA), using economic modelling in pharmaceutical, medical devices and health promotion programs. She has been involved in the national policy decision-making process as a member of the Health Economic Working Group and Price Negotiation Working Group under the Subcommittee of National List of Essential Medicine, in which HTA has played an important role since 2008.
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Ms. Lin Liang leads the value-based pricing unit at the Agency for Care Effectiveness (ACE), the national Health Technology Assessment (HTA) agency in Singapore. She started her career in the pharmaceutical industry before she joined the National Healthcare Group and advised Pharmacy & Therapeutics committees in public hospitals on incorporating HTA principles in formulary management. Leveraging her experience in both the private and public healthcare sectors, Lin Liang contributes technical capability in HTA at ACE and engages companies in pricing negotiations. She has published systematic reviews and cost-effectiveness studies in peer-reviewed journals, and holds an MSc in International HTA from the University of Sheffield.

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Ms. Li is a health and value professional in the pharmaceutical industry. She has rich and solid experience in market access and pricing strategy, value communication, brand management and general management. Ms. Li received her MBA degree from the Wharton school and BA from China University of Political Science and Law.

Dr. Viva Ma
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Dr. Viva Ma is the Outcome Research Lead of the HEOR Center of Excellence in Becton Dickinson (BD), Greater Asia. Dr. Ma has dedicated her career to improving affordability and patient access to innovative treatment strategies across the Asia Pacific region. She has expertise in health economics, reimbursement and outcomes research, and plays an integral role in various research and policy forums, including the International Society for Pharmacoeconomics Outcomes Research (ISPOR) and the Health Technology Assessment International (HTAi) Asia Policy Forum.

Dr. Ma holds a PhD from the University of Wyoming, and a Master’s of Public Health and Master’s of Business Administration from Johns Hopkins University.
Prof. Guy Maddern

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Professor Guy Maddern is the RP Jepson Professor of Surgery at the University of Adelaide, Director of Surgery at The Queen Elizabeth Hospital and Royal Adelaide Hospital, Director of Research at the Basil Hetzel Institute for Translational Health Research at The Queen Elizabeth Hospital, and Director of Surgical Research and Evaluation (incorporating ASERNIP-S) at the Royal Australasian College of Surgeons. He was trained at the University of Adelaide and became a Fellow of the Royal Australasian College of Surgeons in 1989. His clinical interests include the physiological impact of laparoscopic surgery and, more recently, the development of techniques to manage metastatic hepatic disease. He has over 500 publications in scientific journals and has contributed to over a dozen surgical texts.

The evaluation of new technologies, particularly surgical technologies, is an area of focus and interest. Under his supervision, ASERNIP-S has been responsible for assessing these technologies before exposing the Australian population to them, has provided this service to the Australian and International community for the past 20 years, and is recognised, nationally and internationally, as the premier surgical innovation assessment group. He is a past President of HTAi and past Chair of INAHTA.

Mr. Ariosto Matus

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Mr. Ariosto Matus Pérez, of Mexican nationality, works for the laboratory Roche as Leader of Health Systems and Policies for Latin America. He developed his professional career in both the public and private sectors, has worked with multilateral organizations, offers consulting services and lectures at the university.

In the public sector, Ariosto worked in the Senate of the Republic as an adviser in social policy; in the Ministry of Health as Director of Program and Policy Evaluation; and, finally, in the Office of the Presidency of the Republic as Deputy Director of Health Policies. In the private sector, he started his career in the pharmaceutical sector with the laboratory Abbott in the access area. He then worked at Bristol Myers Squibb as Public Affairs Manager and, since 2017, joined Roche in the regional position. In multilateral organizations, he participated in the Leaders in International Health Program of PAHO and collaborated with WHO in the Department of Health Systems Financing in Geneva. He has two postgraduate degrees: an MPA in Economic and Public Policy (LSE) and an MSc in Health Policy, Planning and Financing (double degree by LSHTM and LSE).
Dominique Milea has more than 25 years of experience in the pharmaceutical and healthcare environment, both in Europe and Asia. She has worked in the areas of health economics and real-world evidence in support of market access for the past 15 years, arriving in Singapore in 2012. She is currently Senior Director for Value Evidence and Outcomes for Asia Pacific at GSK. In this role, Dominique is responsible for developing regional evidence plans to demonstrate the value of GSK assets and for guiding the development of local reimbursement and access strategies. Dominique holds a pharmacy degree from The University of Paris V in France, a Master’s degree in public health from the University of Paris XI in France and a PhD in health economics from University of Lyon II in France.

Dr. Izzuna Mudla Mohamed Ghazali is a Public Health Physician with specialty in epidemiology. She is the Head of Horizon Scanning, Communication and Information Unit at Malaysian Health Technology Assessment Section (MaHTAS), Medical Development Division, Ministry of Health Malaysia. Dr. Izzuna joined MaHTAS in 2007 and has been involved in the planning and implementation of the health technology assessment program since then. In 2013, she was given the responsibility to set up horizon scanning of emerging health technologies activity for the Ministry of Health Malaysia. At the same time, she continued her role as a senior reviewer for various health technologies. Dr. Izzuna is also the liaison officer for MaHTAS in networking with international HTA agencies and has published several articles on public health issues in international journals.
Kanchan Mukherjee is a Professor at the Center for Health Policy, Planning and Management at the Tata Institute of Social Sciences (TISS) in India. Prof. Mukherjee is a clinician with specialization in Public Health (gold medalist). He completed a Fogarty Postdoctoral Fellow at UCLA for HIV/AIDS research and a Master’s in International Health Policy with distinction in health economics from the LSE. As an expert for evidence to policy translation, he was invited as a Visiting Professor by the University of Liverpool in the United Kingdom and the Karolinska Institute in Sweden. He is the founder and convener of the Master’s in Health Policy, Economics and Finance programme at TISS, which integrates HTA within the MPH curriculum, the only one of its kind in South Asia. He has 18 years of teaching and research experience in health systems and policy analysis, economic evaluation, urban health, HIV and NCDs. He is involved with the Health Technology Assessment (HTA) and evidence to policy translation programme in India as an expert and is a member of the Global Consortium on Public Health Research and India representative to HTAsia Link and HTA International.

Ms. Jooyeon Park is an associate research fellow of the Division of New Health Technology Assessment (nHTA) at National Evidence-based Healthcare Collaborating Agency (NECA). She has worked for NECA since 2009, and has conducted research in systematic reviews, economic evaluations of health technologies, burden of disease and budget impact analysis. From 2014 to 2016, she participated in Horizon Scanning Service Innovative Global Health Technology (H-SIGHT), horizon scanning projects of NECA, and EuroScan International Network.

Ms. Park received her BA in biomedical engineering in 2004, MA in public health in 2011 and is currently a doctoral candidate in public health at the Korea University.
Parashar is Senior Vice President, Government Affairs & Market Access at ViewRay. He leads global efforts to demonstrate the value of ViewRay technologies to drive adoption in key global markets. Parashar is responsible for leading all aspects of government affairs and market access, including the strategic vision, plans and objectives required to both enable and accelerate corporate growth.

From July 2003 to June 2019, Parashar led Boston Scientific’s global teams focused on the development and execution of market access, health economics, and public policy strategies for key technologies. Prior to joining Boston Scientific, Parashar was Deputy Director of the Hospital and Ambulatory Policy Group at the Centers for Medicare & Medicaid Services (CMS). The group was responsible for Medicare payment policy for a wide range of acute and ambulatory care services, including inpatient and outpatient hospital services and physician services.

Parashar has also held a variety of roles at CMS, the American Association of Health Plans, the Office of (then) Senate Majority Leader George J. Mitchell, the White House Office of Management and Budget, and Connecticut’s Medicaid agency. He holds a B.A. in Political Science and a Master’s of Public Affairs from the University of Connecticut.

Dr. Franz Pichler
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Franz Pichler is a Senior Director in the Global Public Policy group at Eli Lilly and company. He specializes in international health care policy issues relating to Health Technology Assessment (HTA). He supports regional market access policy in Japan, where he chairs the PhRMA Japan Vision Task Force, and in China, where he co-chairs the HTA Working Group of the China R&D Based Pharmaceutical Association Committee (RDPAC). Previously, he has worked on the European HTA policy, including representing Lilly on the EFPIA HTA Working Group, EuropaBio HTA and Market Access Group and as a participant of the IMI GetReal public-private partnership.

Franz has been an active member of HTAi for over ten years. In 2012, Franz co-founded the HTA-Regulatory Interactions Interest Group and chaired this IG until its merger to form the Regulatory Interactions and Conditional Coverage (RICC) Interest Group in 2016. He currently chairs the Business Development Group and is a member of the Scientific Development and Capacity Building (SDCB) Committee and the Asia Policy Forum Organizing Committee (APFOC).

Franz joined Lilly in 2012 after serving as the manager of the HTA Programme at the Centre for Innovation in Regulatory Science (CIRS), a non-profit, independent medicines policy and research think tank. Prior to joining CIRS, Franz worked for over 10 years in molecular biology with specialties in functional genomics, population genetics and bioinformatics. He obtained his BSC in biology and PhD in population genetics at the University of Auckland in 1997 and 2002, respectively.
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Virginia is head of Health Economics and Market Access for the Asia-Pacific region at Boston Scientific. She leads a team of health economists in developing strategies and evidence to support market access across the APAC region.

Virginia has more than 12 years’ experience in health economics and market access for pharmaceuticals and medical devices, for Government payers and industry. Prior to Boston Scientific, Virginia assessed medicines for public-sector reimbursement for both the Pharmaceutical Benefits Advisory Committee (PBAC) in Australia and PHARMAC, the New Zealand Government’s Pharmaceutical Management Agency. She has worked across a broad range of therapeutic areas including oncology, infection, auto-immune diseases, ophthalmology, smoking cessation, mental health, cardiovascular and renal disease.

A passion for medicine combined with a rigorous analytic ethic lead, Virginia completed a science degree with first class honours in Pharmacology and a Bachelor of Commerce in Economics from the University of Otago in New Zealand.

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Dr. Raoh-Fang (Jasmine) Pwu is Director of the National Hepatitis C Program Office at the Ministry of Health and Welfare in Taiwan. She also is adjunct Assistant Professor at the Taipei Medical University and Fu Jen Catholic University. Trained as an epidemiologist, Dr. Pwu has picked up the expertise in research designs and analysis of large/claims database early in her career. Along the research path, she found that economic evaluations in healthcare quite interesting and determined to pursue a career in this field. She is one of the first researchers excelling modelling cost-effectiveness of medicines and public health interventions in Taiwan. During the time when she worked in the HTA unit of CDE in Taiwan, she and her team built up many good examples of the HTA system and research. Dr. Pwu has been involved in many regional and global HTA activities, and she served on the INAHTA Board from 2010-2012. She and her HTA colleagues from Thailand and Korea created HTAsiaLink in 2010 and she served as their President from 2014 to 2016. She is currently an ISPOR Board of Director (2018-2021).
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Ms. Wanda Rawluk is Events Manager for Health Technology Assessment international (HTAi). Wanda holds a Bachelor of Applied Arts Degree and certificates in both Project Management and Event & Meeting Management. Her professional experience spans a variety of industries where she has overseen numerous projects of varying complexities from concept to completion, including the management of all aspects of national and global events. After starting her career in television and film production, Wanda moved into the business side of the industry working in international marketing and events, promoting entertainment brands world-wide. Her professional experience also extends into academic and not-for-profit environments where she has developed and implemented medical conferences, and led the development and delivery of events focused on building and strengthening relationships with major donors and key industry stakeholders.

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Andrew Rintoul is a health economist working for World Health Organization in Geneva. He works in the Department of Essential Medicines and Health Products where he is responsible for the pricing, HTA, shortages and supply chain issues. Before joining the World Health Organisation, he worked for the Australian Government Department of Health on the Pharmaceutical Benefits Scheme for 12 years. From 2011 until 2016, he was Director of Pharmaceutical Pricing, where he was responsible for pharmaceutical pricing and pricing negotiations for the Australian Government.

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Dr Junainah Sabirin is a Public Health Physician and is currently the Deputy Director of the Malaysian Health Technology Assessment Section (MaHTAS), Medical Development Division, Ministry of Health, Malaysia. She has vast experience in conducting health technology assessment for various types of health technologies as an input to policy or decision making for health technologies especially for facilities under the Ministry of Health, Malaysia. She is currently responsible for the planning, implementation, monitoring and evaluation of HTA and Clinical Practice Guidelines activities including the conduct of local economic evaluation, Value-Based Medicine and Horizon Scanning activities. Also has the experience of working in hospital, district health offices and Disease Control Division, Ministry of Health, Malaysia.
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Dr. Mel Santillan is currently the Acting Senior Manager of the Benefits Development and Research Department of the Philippine Health Insurance Corporation, which is responsible for the development of the overall corporate benefit agenda and design of the provider payment mechanisms. She joined PhilHealth in 2002 under the Health Technology Assessment Unit of the Quality Assurance Research and Policy Development Group that guides national policies on reimbursement of drugs and medical/surgical procedures as well as the development of standards for health care providers. She led the team that pioneered the development and benefit design of catastrophic packages, branded as the “Z Benefits” of PhilHealth. Recently, Dr. Santillan steered the efforts for the institutionalization of the PhilHealth Costing Framework and Tools. At present, she is the primary lead for the transitioning of the case rates provider payment mechanism to global budget and diagnosis-related groups.

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Sudigdo is a Professor of Pediatrics and Consultant in Pediatric Cardiology. He completed his medical education at the Medical School, University of Indonesia in 1972 and pediatric training at the same university in 1980. In 1985-1987 he was a Fellow in Pediatric Cardiology, Royal Children’s Hospital, Melbourne, and in 1998 he completed the PhD program at the University of Indonesia.

His main interests are evidence-based medicine, research methods especially clinical trials, clinical practice guidelines, and health technology assessment. He was the Editor-in-Chief of Paediatrica Indonesiana, the Indonesian Pediatric Society journal for 18 years (1994-2012), and Co-Chairman of Medical Staff of Cipto Mangunkusumo Hospital, the national referral hospital in Jakarta. He wrote and/or edited books on pediatrics, pediatric cardiology, evidence-based medicine, research methods, clinical trials, and health technology assessment. He was appointed as the Chairman of the Health Technology Assessment Committee, Ministry of Health, Republic of Indonesia in 2014.
Masayo Sato is health outcomes research and HTA scientist at Eli Lilly, based in Kobe, Japan. In her role, she supports for preparation of local cost effectiveness analysis model adaptation and real-world evidence generation for reimbursement and market access for Asia Pacific countries.

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Sumitra has been with GSK in global and regional roles for over 13 years. She has focused on expanding the use of innovative methodology to deliver real world evidence in support of multiple therapeutic areas. She led an effort to assess the quality of real-world data sources in the region and advocated for rigorous study design and methodology to increase the credibility of real-world evidence for regulatory and reimbursement decision-making. Prior to re-locating to Singapore, she served as the global epidemiology lead for pazopanib at GSK, contributing to successful regulatory submissions and presentations at FDA Oncology Advisory Committees. Sumitra is a trained cancer epidemiologist, having received her PhD in Epidemiology from the Gillings' School of Global Public Health, University of North Carolina (UNC) at Chapel Hill where she was a recipient of a multi-year cancer epidemiology fellowship from the National Cancer Institute. She holds dual adjunct appointments at UNC Chapel Hill and at Duke-NUS.

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Ms Hana Shim is a Public Affairs and HEOR specialist in Becton Dickinson (BD) Korea. She has worked in regulatory affairs, health economics and reimbursement in both pharmaceutical and medical device industries. She started her career in Pfizer Korea regulatory group where she participated in GMP inspection and Korea FDA dossier creation. Ms. Shim then moved to Bristol-Myers-Squibb Korea to broaden her expertise in health economics and reimbursement. Ms. Shim holds a Bachelor of Public Health from the University of Arizona in the United States.
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Liesl Strachan is a Director of Global Health Policy, Reimbursement and Health Economics within the Corporate team at Medtronic Inc. In her current role she supports the Health Economics and Reimbursement functions within Medtronic globally with their efforts towards demonstrating the safety, clinical effectiveness and economic value of Medtronic’s innovative technologies and healthcare solutions whose purpose is to improve the health outcomes of patients around the world. Liesl has 18 years’ experience within the field of Health Outcomes and Health Economics research both locally and internationally working for industry and on behalf of government bodies within Australia and Europe.

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Mrs. Netnapis Suchonwanich, Former Deputy Secretary-General of National Health Security Office in Thailand, graduated with her bachelor’s degree in pharmacy and master’s degree in IT management. She’s played a key role in Universal Coverage Scheme in Thailand since 2002. During such times, she was the pioneer in health insurance information systems development at National Health Security Office and developed many core applications needed for UHC, such as the beneficiaries enrollment system, provider registration, medicines and medical devices administration, the financial and accounting system and the electronic claim system with automatic financial tracking process. In 2009, she started to collaborate with Government Pharmaceutical Organization to establish central procurement with the vendor-managed inventory program for high-cost medicines and vaccines listed in national priority program finally extended to National Antidotes program in 2011. From her experiences in universal health care administration, she has been nominated as member for National Essential Drug Subcommittee and chairs for price negotiation working group for competitive medicines submitted to be essential medicines in Thailand.
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Rebecca Trowman, M.Sc., B.Sc., has formal training and a wealth of experience in conducting HTA and health policy development. She previously worked at the National Institute for Health and Care Excellence (NICE, UK). At NICE, she conducted and supervised the production of technology appraisals, provided scientific advice to pharmaceutical companies, contributed to the review of the NICE methods guide and represented NICE at international conferences and training events. She has also worked as a senior policy officer in the Western Australia Department of Health. Her role there included initiation of a disinvestment work program, and management of workforce and service planning. Rebecca holds an MSc in Health Services Research and a B.Sc. in mathematics and statistics, and has formal training in systematic reviewing and health economics.

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Indira has more than 15 years’ global experience in pharma, biotech and academic sectors in Europe, Middle East and Asia. She has led several projects on planning and execution of the key evidence generation projects including epidemiology and health economic studies to support market access activities, health policy initiatives and curriculum design/delivery for numerous HTA trainings and workshops to cross-functional market access teams.

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Julie has more than 20 years experience in the pharmaceutical in healthcare evaluation with related expertise in comparative effectiveness, health technology assessment, health economics, outcomes research and policy research and analysis and through working in different Countries she has experience across numerous geographies including Australia, the US, Europe and Asia Pacific. She is particularly interested in conducting research to inform healthcare decision-making. While working in Australia, Julie built one of the industry’s leading health economic teams. She has significant experience working with the PBAC, overseeing the completion of more than forty reimbursement submission and three PBAC reviews, and has represented Medicines Australia in the Health Economic Working Group (HEWG) and HEWG-HTA working group as well as ARCs educational working group. Julie is currently responsible for MSD’s Centre for Observational and Real World Evidence (CORE) team in Asia Pacific which will support HTA development, local data generation and capability building.
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Ms. Lillian Wang is a pharmacist, with a M.Sc. in Health Policy and Management and an MBA. She has approximately 20 years of experience working in HTA, market access and public affairs in the pharmaceutical industry in Taiwan and Hong Kong. In 2018, she joined Edwards LifeSciences as the Director of Health Economics and Reimbursement in Greater China and Korea.

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Ms. Ya Hsin Wang is the General Secretary of Psoriasis Association Taiwan and advocate for patients’ rights. Ms. Wang is also patient representative of PBRS (Pharmaceutical Benefit and Reimbursement Scheme Joint committee) committee.

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Yaoling Wang is a Research Assistant who works with government and industry to grow the economics evaluation report on specific topic (e.g. procedures and oncology drug). After collaborating with diverse partners and evaluating for innovated projects, Yaoling believes that what truly drive conversions, push forward the progress of health technology development, it’s how well you collecting evidence and presenting your analysis to the real world. Yaoling has landed coverage in multiple-health dimension and jointly collaborate with international partners such as WHO, Bill & Melinda Gates Foundation, NICE, Imperial College London and etc. Yaoling holds a BSc in Economics and Mathematics from University of Minnesota, and MSc in health policy, planning and financing from London School of Hygiene and Tropical Medicine and London School of Economic and Political Sciences.
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Wan Qing is a horizon scanning specialist with the Agency for Care Effectiveness (ACE) at the Ministry of Health, Singapore. She develops and implements ACE's horizon scanning framework to identify new and emerging health technologies, including managing market intelligence for such technologies and assessing their potential impact. Previously, she managed intellectual property for a technology transfer office and later, an immuno-oncology company.

She holds a PhD in neurobiology and a degree in biological sciences.

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