Addressing the Burden of Cancer in Singapore

By SAPI Oncology Working Group Position Paper

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SINGAPORE ASSOCIATION OF PHARMACEUTICAL INDUSTRIES

EXECUTIVE SUMMARY

The SAPI Oncology Working Group was established in March 2017 comprising Singapore Association of Pharmaceutical Industries (SAPI) member companies that provide cancer medicines. As part of SAPI, our goal is to make innovative medicines accessible to patients in Singapore. We aim to achieve this through collaborative efforts with all stakeholders in the healthcare system to direct efforts toward interventions that deliver value to society in a sustainable manner.

Cancer is one of the major diseases, and leading cause of morbidity and mortality in Singapore. With an ageing population, coupled with the high incidence of various cancers and overall cost of care for patients, the socioeconomic burden of cancer in Singapore is substantial.

Recent advancements in cancer treatments and the development of innovative therapies have driven better patient outcomes. In addition, innovative cancer treatments have provided significant benefits and value to both patients and the economy.

MediShield Life (MSL) have provided increased coverage and access to cancer care for Singaporeans.
With the impending associated cancer burden from the Silver Tsunami, an increase in Singapore's healthcare expenditure can be expected. The change in the population demographics and the emergence of new therapies for the existing treatment gaps, as well as new treatment paradigms mean that MSL will need to be optimised for long term sustainability to drive better outcomes for both cancer patients and the society.

Suggestions to optimize oncology treatment funding to drive a sustainable healthcare ecosystem:

1) Optimising the 3M Framework, specifically MSL, to
    a. Expand coverage of MSL to include cancer diagnostic testing
    b. Include an option for Singaporeans to pay for additional premiums to increase coverage of treatments for cancer under MSL.

2) Implementing alternative payment methods, such as Risk-Sharing Agreements (RSA), instead of broad stroke restrictions which may limit access. These RSAs provide cancer patients access to innovative medicines while managing total budget impact in a healthcare system.

3) Improving the efficiency of the Singapore healthcare system by putting in place treatment guidelines to optimise treatment outcomes.

BURDEN OF CANCER IN SINGAPORE

As Singaporeans live longer, the implications of an ageing population are becoming increasingly visible. The number of citizens aged 65 and above is increasing rapidly – and will nearly double from 440,000 in 2015 to 900,000 in 2030.[1] Based on this projection, total healthcare expenditure is expected to triple, rising from S$17 billion in 2013 to S$44 billion in 2030, increasing from 4.6% to 7.3% of GDP.[1]

Cancer is the leading cause of mortality in Singapore. From 2011 to 2015, more than 26,000 Singaporeans died of cancer, accounting for almost 30% of all deaths in the country.[2] During the same period, there were more than 64,000 Singaporeans diagnosed with cancer. In terms of burden of disease, cancer is ranked no. 1 as a cause of DALY loss in Singapore Residents (17%), posing 119,862 life-years lost, which is even more than diabetes.[3]

Furthermore, cancer is one of the major diseases affecting Singaporeans. Incidence and prevalence of cancer in Singapore is expected to rise due to the Silver Tsunami.[3] While Singapore has improving survival rates for cancers of the rectum, cervix, uterus, ovary and bladder, more progress can be done for lung, breast and prostate cancers. Specifically, the increased survival rates could be partly attributed to earlier detection of the cancers.[4] With early detection, innovative treatments and supportive care available, many cancers are now turned into chronic illnesses.

Additionally, it is important to also consider the possible socioeconomic impact of cancer burden on the patients' caregivers, who are a part of the society. Caregivers often have to make adjustments to their career and living environment in order to care for patients. The stress of caregiving may in turn adversely affect them emotionally.[5]

The Singapore government have put into place various schemes to help patients manage their out-of-pocket spending for cancer treatments.[6] To safeguard against any financial disastrous situations which may result due to cancer, the government ought to continue to monitor current and potential healthcare gaps as well as look into opportunities to ensure availability and equal access to relevant drugs to manage cancer.

While the socioeconomic burden inflicted by cancer is inevitable, effective treatment of cancer is necessary to mitigate its socioeconomic impact, as well as for patients to maintain their quality of life, remain productive and contribute to the Singapore economy for as long as possible.

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[1] A Sustainable Population for a Dynamic Singapore: Population White Paper. January 2013. National Population and Talent Division, Prime Minister's Office.
[2] Singapore Cancer Registry Annual Registry Report 2015, National Registry of Diseases Office
[3] Ministry of Health Singapore. Disease Burden. Retrieved May 13, 2018, from https://www.moh.gov.sg/content/moh_web/home/statistics/Health_Facts_Singapore/Disease_Burden.html
[4] HealthHub. (2016, July 4). Cancers rise, but survival rates also up. Retrieved from https://www.healthhub.sg/live-healthy/1135/cancers-rise-but-survival-rates-also-up
[5] Straits Times. (2017, April 08). Giving up a career to care for elderly parents. Retrieved from https://www.straitstimes.com/lifestyle/caregivers-need-care-too
[6] Chan A et al (2013) Affordability of cancer treatment for aging cancer patients in Singapore: an analysis of health, lifestyle, and financial burden, Support Care Cancer. 2013 Dec;21(12):3509-17

VALUE OF CANCER TREATMENTS TO PATIENTS AND ECONOMIES

Value of Cancer Treatments to Patients

A recent report published in March 2017 by PhRMA titled "Prescription Medicines: International Costs in Context", highlighted that new therapies in oncology have contributed to significant declines in cancer mortality rates around the world.[8] It is well recognized that with improved understanding of disease and the advancement of more targeted and personalized medicines, patient survival rates have improved over time. As of today, there has been substantial progress in the fight against cancer, with over 1,800 oncology medicines being developed and studied currently.[7] Taking blood cancers as an example, what was known as a "disease of the blood" over 60 years ago, have today been categorized into approximately 40 unique types of leukemia and 50 unique types of lymphomas. With personalized medicines today, patients with chronic lymphocytic leukemia and Hodgkin's leukemia are gaining an increase in 5-year survival rates to 70% and 80% respectively.[8] Today, 2 out of 3 people diagnosed with cancer will survive at least 5 years[9], and approximately 83% of survival gains in cancer are attributed to new treatments.[10]

Closer to home, countries like Korea, Japan and Australia have all registered 12%, 19% and 26% decline in cancer mortality rate between the period of 1991 to 2014,[11] highlighting the immense value and benefit of cancer treatments to patients.

Value of Advancement in Cancer Treatments to Economies

Relative to overall healthcare expenditure, spending on prescription medicines have been shown to occupy a small share of the total spends. OECD Health Statistics Database recorded spends on prescription medicines hovering between 10% to 16% compared to total healthcare spending in countries across the Asia Pacific such as Australia, Korea and Japan.[12] Specific to oncology, a 2013 population-based cost analysis looking at the economic burden of cancer across the European Union (EU) showed that only 1% of overall healthcare spending was attributed to cancer medicine, while total cancer care took up 25% of total spend.[13]

Apart from healthcare spend attributed to cancer care for diagnosed patients, another important consideration will be productivity; specifically productivity gains or losses as a result of cancer-related mortality. When individuals, especially of working age group lose the ability to work due to cancer, this immediately represents a loss of productivity to society. Thus, it is important to take into context the advancement in innovative cancer treatments today, as well as the impact this has on reducing productivity loss by enabling cancer patients to be able to return to work and continue to contribute to society.

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[7] Adis R&D Insight Database.
[8] PhRMA slides on Prescription Medicines: International Costs in Context, March 2017
[9] American Cancer Society Cancer Statistics Center
[10] Sun et al., 2008 "The determinants of recent gains cancer survival: an analysis of the surveillance, epidemiology, and end results (SEER) database," Journal of Clinical Oncology.
[11] WHO Mortality Database (accessed January 2017);
[12] OECD Health Statistics Database (accessed February 2016); Altarum Institute, 2015, A ten year projection of the prescription drug share of national health expenditures including non-retail; ABPI analysis of UK National Health Service data. Farmindustria analysis of Italian Medicines Agency (AIFA) and National Institute for Statistics (Istat) data.
[13] Luengo-Fernandez et al., 2013, "Economic burden of cancer across the European Union: a population-based cost analysis," Lancet Oncology.

Bradley et al.[14] used a human capital model that predicts the economic benefit of reduced cancer mortality, specifically in the United States population for the years 2000 till 2020. The method is used to calculate the expected lifetime earnings lost due to premature mortality of 19 types of cancer. The projected value was USD147.6 billion by 2020 and death from lung cancer accounted for more than 27% of productivity costs, with colon (9%) and breast (8%) cancer following right behind. These cancers are also the top 3 cancers in Singapore.[15] Sensitivity analyses performed on lung, colorectal, breast, leukemia, pancreatic and brain cancer mortality where a 1% annual reduction in mortality in these cancers was shown to lower productivity costs by USD814 million per year.

In another study also utilizing human capital models, Pearce A. et. al.[16] estimated the cost of cancer deaths between 2011 till 2030 in Ireland. 223,000 projected deaths from all invasive cancers between the projected periods will result in loss productivity of €73 billion, representing 1.4% of Ireland's annual GDP. Similarly, lung (€14.4 billion), colorectal and breast (€8.3 billion each) cancers are the costliest cancers. In terms of productivity losses per cancer death, cancers such as testis and cervix cancers are most costly despite lower incidences as they affect working age individuals and negatively impacts the additional productive years of life lost. A 1% annual reduction in mortality in this study was able to reduce productivity losses by €8.5 billion over 20 years.

Lastly, in a population-based comparative study by Pearce A et. al.[17] looking to estimate the value of productivity losses in 2012 due to premature mortality from cancer across five countries (Brazil, Russia, India, China and South Africa), captured a total cost of $46.3 billion of lost productivity. The study concluded and recommended the need for locally-tailored strategies to reduce the economic burden of cancer. In addition, it also suggested to look at broader programs (e.g. cancer screening, vaccination programs), combined with access to adequate treatment to yield significant gains for both public health and economic performance of these countries.

With advancement in cancer treatments, 4 out of 5 cancer patients are able to return to work post diagnosis due to innovative cancer therapies.[18] Consistent to these findings, a recently published cohort study in Japan following Japanese cancer survivors showed that 81% of diagnosed patients were able to resume work within 12 months from their initial sick leave.[19]

It is critical for all countries and governments to acknowledge this paradigm shift in the value created by cancer treatments. Also, it is necessary to re-assess previous school of thought where cancer funding may be seen as an "unwise investment" to attain survival of cancer patients with no contribution towards productivity. Instead, there should be a progressive approach towards adopting an environment which supports advancement in cancer treatments, as well as to make "investments" that will yield reductions in losses to productivity.

[14] Bradley CJ, Yabroff KR, Dahman B, Feuer EJ, Mariotto A, and Brown ML. Productivity Costs of Cancer Mortality in the United States: 2000 – 2020. J Natl Cancer Inst 2008;100: 1763 – 1770.
[15] National Cancer Registry, Singapore, MOH
[16] Pearce A, Bradley C, Hanly P et al. Projecting productivity losses for cancer-related mortality 2011 – 2030. BMC Cancer (2016) 16:804. DOI 10.1186/s12885-016-2854-4
[17] Pearce A, Sharp L, Hanly P et al. Productivity losses due to premature mortality from cancer in Brazil, Russia, India, China, and South Africa (BRICS): A population-based comparison
[18] Amir and Brocky, 2009, "Cancer survivorship and employment: epidemiology," Occupational Medicine
[19] Endo et al., 2015, "Returning to work after sick leave due to cancer: a 365-day cohort study of Japanese cancer survivors," Journal of Cancer Survivorship;

OPTIMIZING ONCOLOGY TREATMENT FUNDING TO DRIVE A SUSTAINABLE HEATLHCARE ECOSYSTEM

In view of the burden of cancer in Singapore, and the value generated by cancer treatments and their advances to patients and economies, the SAPI Oncology Working Group hereby recommends increased collaborations with stakeholders across the healthcare system to improve cancer patient care. Strategies could include optimizing the 3M framework to provide improved access to cancer screening diagnosis and better use of personalized medicine, implementing risk-sharing agreements as well as identifying strategies to increase the efficiency of the healthcare system.

1) Optimizing 3M Framework to Improve Access to Cancer Diagnostics & Precision Medicine

The 3M framework has been integral in supporting the healthcare needs of Singaporeans, including cancer patients. In particular, both Medisave and MediShield Life (MSL) have played considerable roles in supporting and financing treatment for cancer patients in Singapore. Currently, Medisave provides reimbursement of $600 per year per patient for cancer diagnostics, and $1,200 per month per patient for outpatient chemotherapy[20]. While MSL has a claim limit of $3,000 per month for outpatient chemotherapy[21].

To top up coverage, patient can opt to purchase Integrated Shield Plans (IPs). Many IPs also come with full riders. However, full riders may cause unnecessary excessive treatments as there is no out-of-pocket payment required. To address this, the Parliament has announced that Singaporeans buying a new rider will need to pay at least 5 per cent of his/her hospital bill[22]. SAPI supports the government's move in limiting the rider component to ensure sustainability of the healthcare system in the long run.

Technological advances have led to rapid developments in both cancer screening and precision medicine. Cancer screening has allowed for the detection of incipient cancers, such that the cancer can be treated before it becomes malignant, reducing its occurrence and resulting mortality. Precision Medicine has transformed patients' lives by delivering care tailored to the individual, thereby helping to diagnose and treat patients quickly and more effectively. It will be optimum to leverage on such tools to drive better outcomes objectively, for both cancer patients as well as the society.

At present, Medisave provides some coverage of $600 a year for cancer diagnostics[20]. In view of improving access to personalised treatment, there would be a need to increase coverage for cancer diagnostics. SAPI believes that enhancements to MSL are necessary to provide cancer patients with the coverage and access to such options to drive optimal treatment outcomes.

Suggestions to improve MSL:

- Expand the coverage of MSL to include cancer diagnostic testing, to guide decision making and selection of appropriate drugs that will provide patients with the best therapeutic outcomes while ensuring cost efficiencies.
- Provide an option for Singaporeans to pay for additional premiums to increase coverage of treatments for cancer under MSL.

[20] Ministry of Health Singapore. (2018, June 4). Medisave Uses & Withdrawal Limits. Retrieved from https://www.moh.gov.sg/content/moh_web/home/costs_and_financing/schemes_subsidies/medisave/Withdrawal_Limits.html

[21] Ministry of Health Singapore. MediShield Life Benefits. Retrieved from https://www.moh.gov.sg/content/moh_web/medishield-life/about-medishield-life/medishield-life-benefits.html

[22] The Straits Times. (2018, March 08). Parliament: Patients who buy new riders for Integrated Shield Plans will have to pay 5 per cent of hospital bills. Retrieved from https://www.straitstimes.com/politics/parliament-patients-who-buy-new-riders-for-integrated-shield-plans-will-have-to-pay-5-per

2) Implementing Risk-sharing Agreements

Risk-sharing agreements (RSAs) between pharmaceutical companies and payers has been increasing in the field of innovative oncology medicines, which aims to ensure better budgetary control and a lower risk of spending on medicinal products without full evidence of clinical benefit[23]. A systematic review showed that the overall level of interest in RSAs in the EU has been increasing since 2000, with articles reporting the number of RSAs implemented and case studies have been steadily growing as evidence is becoming more readily available[24].

These agreements allow patients access to innovative medicines in a context of uncertainty about their clinical benefit and cost effectiveness due to limited and/or immature evidence, identifying patient groups where the drug is most effective and reducing the risk of unnecessary expenses by the payers when they are reimbursed[35]. They also allow the price of medicinal products to be aligned with the benefit they provide in a given therapeutic indication or in a particular combination of medicinal products, since different agreements may be implemented depending on the indication or association of medicinal products concerned.

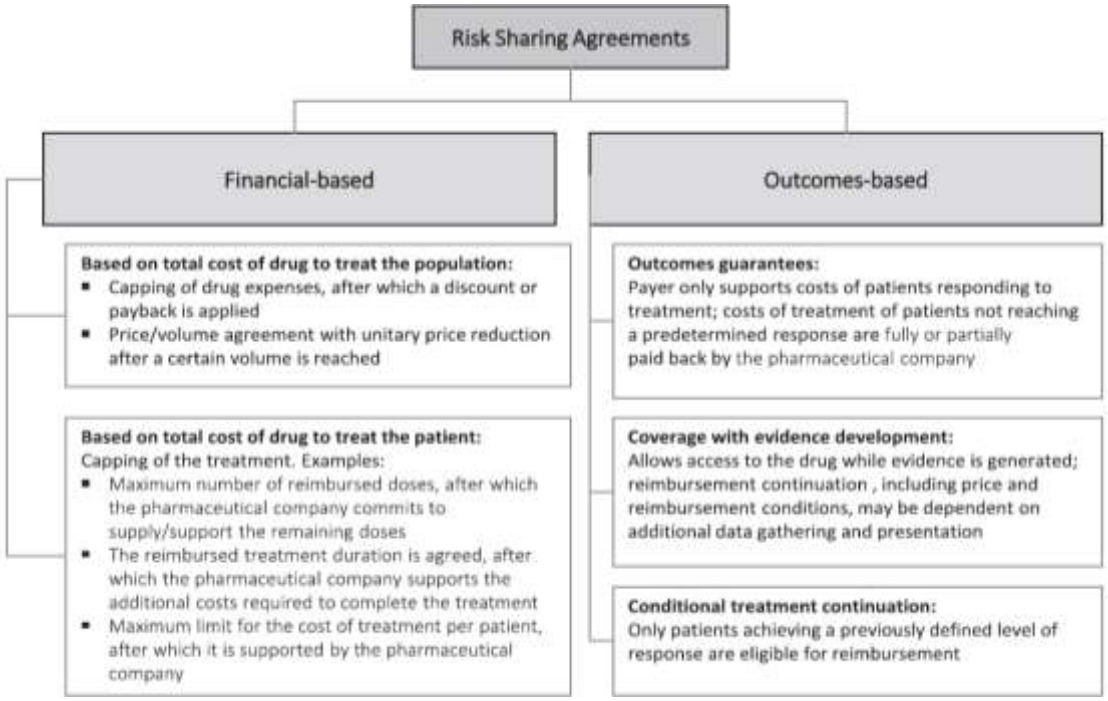
As defined by Health Technology Assessment International (HTAi), a RSA is 'an agreement between the manufacturer and the payer/provider that allows access (coverage/reimbursement) of a health technology under certain conditions. These agreements may use a variety of mechanisms to address uncertainty about technology performance or to manage technology adoption in order to maximize their effective use or to limit their budgetary impact'.

RSAs can be divided into (a) financial agreements, where cost containment is defined merely on the basis of the price of the medicinal product or the cost of the treatment and (b) agreements based on clinical results, i.e. associated with the performance of the medicinal product in real clinical practice (Fig 1 below).

[23] Gonçalves FR, Santos S, Silva C and Sousa G. Risk-sharing agreements, present and future. ecancer 2018, 12:823 https://doi.org/10.3332/ecancer.2018.823

[24] Piatkiewicz TJ, Traulsen JM, Holm-Larsen T. Risk-Sharing Agreements in the EU: A Systematic Review of Major Trends. PharmacoEconomics Open, DOI 10.1007/s41669-017-0044-1

Fig. 1: Taxonomy for risk-sharing agreements



Several advantages of RSA are listed in Table 1 below.

Table 1: Advantages of RSAs

Perspective	**Advantages**
Patients	• Access to innovative medicines • More treatment options and potential health improvement • Promotion of investment for innovation
Providers	• Greater knowledge and improved disease management • Access to innovative medicines • Limiting budgetary impact • Reduction of uncertainty concerning effectiveness
Payers	• Collection of additional evidence (that supports financing decision) • Management of uncertainty (effectiveness and budget) • Therapy directed at patients with potential to benefit (avoiding risk in patients who would not benefit)
Pharma	• Access of innovative medicines to the market • Improved performance of medicine due to use for target patient • Innovation rewarded and research and development stimulated • Confidential terms of agreement, including price

Some challenges associated with RSAs include the complexity of implementing and monitoring of the agreement, allocation of resources related to data collection and protection and follow-up of patients. Although the implementation of RSAs in various countries is still relatively recent and information is limited, their experience could undoubtedly contribute to the success of future RSAs. Singapore, being a small country, will have the opportunity to lead in this field.

With the future of therapeutic innovation and increased pressure on health budgets, an alternative model that provides more flexibility and personalized reimbursement will be required. Thus, allowing the prices of medicines to be aligned with the value they deliver in disease treatment. Hence, there is a need for the government and healthcare institutions to work closely with pharmaceutical companies to deliver cost-effective and outcome-based treatment for cancer patients.

3) Treatment Guidelines to Optimize Delivery of Healthcare

Many health systems have recognized the need to improve cancer outcomes and have established strategies to achieve that. Some selected strategies are listed in Table 2.

Table 2: Selected National Cancer Strategies

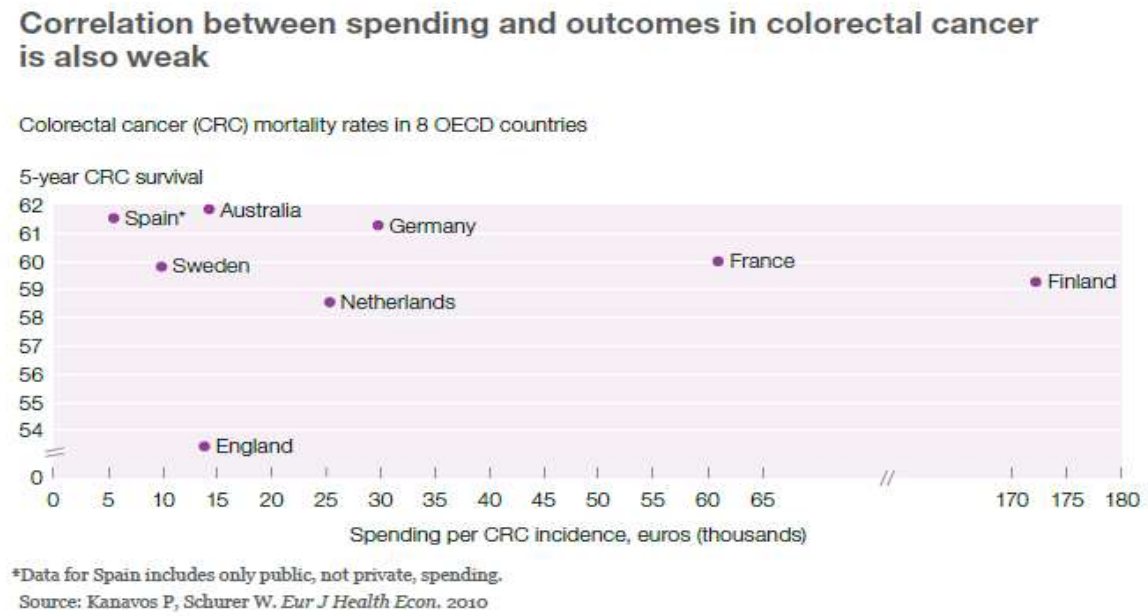
Country	Quantified top-level goals	Topical goals (select examples)
England Improving Outcomes: A Strategy for Cancer (2011)	Achieve cancer survival rates at European average to save 5,000 lives	• Reduce the incidence of cancers that are preventable by lifestyle changes • Improve access to screening for all groups • Achieve earlier diagnosis of cancer to increase the scope for successful treatment
France Cancer Plan 2009-2013 (2009)	Six "flagship" measures, including: • Increase participation in organized screening programs by 15 percent • Ensure that 80 percent of patients benefit from at least one individualized care plan • Ensure that 50 percent of patients benefit from at least one post-cancer plan	• Promote interventional research that tests the effects of changes to the environment and to individual behaviors • Produce annual estimates of incidence and mortality on the basis of a validated methodology; produce updates of prevalence and survival every two years • Ensure referring doctors have access to tools for training, information, and inclusion in screening programs
Victoria, Australia Victoria's Cancer Action Plan 2008-2011 (2008)	Increase survival rates by 10 percent by 2015 to save 2,000 lives	• Reduce major cancer risk factors in the population and maximize effective screening • Ensure rapid translation of research into effective treatments and clinical care • Invest in innovative treatments and technologies and sustainable integrated care systems • Support and empower patients and their caregivers throughout their cancer journey

Considerable discussion has arisen over the affordability of cancer care, especially in light of the efforts many countries are making to control healthcare spending. However, many health systems fall short of providing consistent, high-quality cancer care despite the high spending. Wide variations exist (both within and between countries) in the care delivered and outcomes achieved[25].

Research has shown that the correlation between what countries spends on cancer care and the outcomes achieved are far from perfect. Wide variations in the amounts spent on cancer care exist, and higher spending does not always result in better outcomes. Often, differences in survival rates cannot be explained entirely by differences in patient characteristic, but in differences in how treatment is delivered at individual cancer centers. Figure 2 demonstrates the fact that correlation between spending and outcomes in colorectal cancer is weak.

[25] Aberg, L., Albrecht, B., & Rudolph, T. How health systems can improve value in cancer care. Health International, 2012. Retrieved from https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/how-health-systems-can-improve-value-in-cancer-care

Figure 2: 5-year colorectal cancer (CRC) survival vs Spending per CRC incidence



These findings suggest that health systems have an important opportunity to improve cancer outcomes, in many cases without a sharp increase in costs. A report by McKinsey proposes that a holistic pathway approach will enable health systems to identify and eliminate the factors causing variations in care delivery, thereby increasing adherence with international best practices, and to redirect funding to interventions that have the greatest impact on outcomes.

A BCG 2017 report[26] recommends four key enablers of value in healthcare, viz.

- Informatics – the combination of data standards, information technology (IT) architecture, and analytic capabilities to support the systematic tracking and analysis of health outcomes, relevant risk-adjustment factors, segment-specific interventions and the corresponding costs of care
- Benchmarking, research and decision support tools – benchmarking is intended to compare outcomes, not processes. While benchmarking will make identifying best practices easier and push towards greater efficiency by eliminating inefficient interventions, it also will provide a measuring stick to demonstrate the impact of breakthrough innovation on improving outcomes.
- Payments - as more health systems focus on value, however, payers have begun to address some of these issues and to introduce a value-based component into compensation and reimbursement
- Delivery organizations - In order to shift to the patient-centered, population-based model of care delivery, some care delivery organizations are putting new roles and new organizational structures in place that encourage coordination across the full cycle of care. Such roles and structures also encourage the rational choice of treatment location based on the tradeoff between costs and the expertise needed for the best possible health outcomes.

It is clear from the above that many opportunities abound for health systems to align industry stakeholders around the shared objective of improving health outcomes delivered to patients for a given cost, and then to give stakeholders the autonomy, the right tools and the accountability to pursue the most rational ways of delivering value to patients[38].

[26] Boston Consulting Group. Insight Report: Value in Healthcare - Laying the Foundation for Health System Transformation. World Economic Forum, Apr 2017. Retrieved from http://www3.weforum.org/docs/WEF_Insight_Report_Value_Healthcare_Laying_Foundation.pdf

CONCLUSION

The socioeconomic burden of cancer in Singapore is large, accounting for almost 30% of all deaths and is the leading cause of DALY loss in Singapore Residents (17%). Despite that, advancements in cancer treatments have enabled more patients to maintain their quality of life, remain productive and continue contributing to society. Thus, providing substantial benefits and value for both patients and the Singapore economy. Hence, it is imperative to leverage on such technologies to provide the best outcomes for patients, as well as to mitigate the socioeconomic impact of cancer in Singapore.

While measures, such as MSL, are in place to provide support for cancer patients and better access to cancer treatment, more could be done to optimise treatment funding and ensure sustainability of the Singapore Healthcare Ecosystem. This includes:

Improving the 3M framework for increased affordability and better access to innovative cancer treatments and diagnostics by:

- Expanding coverage of MSL to include cancer diagnostic testing
- Include an option for Singaporeans to pay for additional premiums to cover innovative treatments for cancer under MSL
- Working closely with pharmaceutical companies to implement Risk-Sharing Agreements to provide cancer patients access to innovative medicines while managing total budget impact in a healthcare system
- Focusing on building an efficient and outcome-based healthcare system by putting in place treatment guidelines

We believe the above recommendations support Singapore's Beyond 2020 Healthcare vision for better patient care and also reinforces how we could work together in "Delivering Cost-Effective Care" and Shifting from "Quality to Value". We welcome formation of relevant working group(s) to discuss the implementation of these recommendations.