CANCER CARE AND ACCESS TO CANCER DRUGS IN ASIA-PACIFIC

Executive summary



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Executive summary of the main report "Cancer care and access to cancer drugs in Asia-Pacific"

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Executive summary

Cancer is a growing challenge for health systems around the world. The global numbers of newly diagnosed cancer cases and cancer deaths are predicted to rise by 50% and 64%, respectively, between 2020 and 2040. The increasing cancer burden is driven by demographic changes reflecting the growth and aging of population, along with changes in the prevalence of cancer risk factors (e.g., smoking, unhealthy diet, obesity, physical inactivity). Cancer is already now the leading cause of death in many high-income countries around the globe. It will increasingly become a major public health issue in middle-income countries as well, based on current trajectories.

Cancer patients have very different chances of survival depending on where in the world they live. For example, for patients diagnosed with lung cancer during 2010-2014, 5-year survival was 33% in Japan but only 4% in India. Trends in survival have been generally increasing for most cancer types in the past, owing to advancements in screening, diagnosis, and treatment. To ensure continued progress in the leading countries and for other countries to catch up with these countries, additional investment in effective cancer control policies along the whole patient pathway are vital.

Treatment options for cancer patients are advancing rapidly, in particular in the area of drug treatment. New treatment modalities are often considered to be costly and raise concerns about the budget impact and financial sustainability of health systems, especially in countries with deprived health systems. However, the value of any new treatment modality is not only determined by its costs, but also by the benefits it offers to patients. Finding effective strategies to balance constrained health care budgets with access to innovative treatments with significant clinical benefits to patients is crucial for health policy makers.

Geographic scope of the report

In this report, cancer care and access to cancer drugs in Asia-Pacific is described. 14 countries and locations, referred to as "*markets*" in the report, are analyzed. They are grouped into 7 *high-income markets* – Australia, Hong Kong, Japan, New Zealand, Singapore, South Korea, Taiwan – and 7 *middle-income markets* – China, India, Indonesia, Malaysia, the Philippines, Thailand, Vietnam. Together these markets



Figure 1: Global distribution of cancer deaths, 2019

account for almost half (47%) of the world population and around one third (34%) of the world's economic wealth.

Content of the report

This report provides a comparative analysis of the 14 markets in Asia-Pacific. It is divided into five sub-reports focusing on:

- 1. The burden of cancer
- 2. Health spending on cancer care
- 3. Patient access to innovative cancer drugs
- 4. Health spending on cancer drugs and unmet patient needs
- 5. Pricing policies for off-patent cancer drugs

1. The burden of cancer

Cancer patient numbers have been growing steadily along with the incoming silver tsunami

The number of newly diagnosed cancer cases has increased from 6.6 million to 7.8 million between 2012 and 2018 in Asia-Pacific. Even after accounting for overall population growth in this period, all markets have seen increasing patient numbers; see Figure 2. A key driver in this development is population aging, which is taking place at an unprecedented rate across the region. This "silver tsunami" of elderly people is causing many new cancer cases, as the individual risk of getting cancer increases dramatically with age. However, around 30-50% of all cancer cases would be preventable, according to the WHO. Prevention of major risk factors (e.g., cigarette smoking, obesity, alcohol consumption, infection with hepatitis B and C, human papillomavirus, and *Helicobacter pylori*, air pollution, contamination of water, soil, and food) is key to stem the tide.



Figure 2: Cancer incidence per 100,000 inhabitants (crude rates), 2012 and 2018

While more and more patients survive cancer in high-income markets, patient outcomes in middle-income markets are at best stagnating

Outcomes of cancer patients differ greatly across Asia-Pacific. Survival (here quantified as the complement of mortality-to-incidence ratio) is a prime measure of patient outcomes. For every 100 patients diagnosed with cancer, around 50-65 of them survive in high-income markets compared to 30-40 in middle-income markets; see Figure 3. Recent developments indicate that the situation for cancer patients in high-income markets continues to improve, while patient outcomes in middle-income markets are at best stagnating. A closer analysis of five major cancer types – breast cancer, gastro-esophageal cancer, head and neck cancer, liver cancer, lung cancer – confirms this diverging trend between high-income and middle-income markets. The provision of high-quality cancer care characterized by a rapid adoption of clinical innovations can further increase the odds for cancer survival. The absence of nationwide population-based cancer registries in middle-income markets complicates the monitoring of the effectiveness of cancer control efforts.



Figure 3: Complement of the mortality-to-incidence ratio of cancer, 2012 and 2018

Notes: The complement of the mortality-to-incidence ratio (1–MIR) (ranging from 0 to 1) serves as a proxy for the 5-year survival rate (0% to 100%), in absence of comparable data from population-based cancer registries in all markets and despite its limitations pointed out in previous literature. Numbers in ellipses show relative changes.

Resolute action is required to address increasing cancer patient numbers in the coming decades

Predictions of the future cancer burden in Asia-Pacific indicate increases in the annual number of newly diagnosed cases by 10-90% and deaths by 20-140% over the next two decades; see Figure 4. Advances and investments in all areas of cancer care – prevention, screening, diagnosis, treatment – are needed to meet the challenge brought upon by the demographic development. A clear prioritization of effective cancer control efforts could spare millions of people from getting cancer and avert millions of deaths of those people who get cancer over the coming decades.



Figure 4: Forecasted change in total cancer incidence and cancer mortality between 2020 and 2040

2. Health spending on cancer care

Most markets miss the informal WHO target of public health spending of 5% of GDP

Access to modern cancer treatment is limited in many markets in Asia-Pacific. This is the result of a lack of universal health coverage, a small package of health services covered, high patient copayments on covered health services, or a combination thereof. The root cause of this is insufficient public funding of health care. Public health expenditure as a share of gross domestic product (GDP) tend to be much lower in middle-income markets (on average 2%) than in high-income markets (on average 5%) in Asia-Pacific; see Figure 5. Only Australia, Japan, and New Zealand met the informal WHO target of public health spending of 5% of GDP in 2018, despite increases in public health spending relative to GDP in all markets since 2000.

Public health spending per capita is 70 times higher in Australia and Japan than in India, Indonesia, and the Philippines

Public health spending is less than \$300 per capita in all middle-income markets, ranging from \$289 in China down to \$20 in India; see Figure 5. In the top-spending high-income markets – Australia, Japan, and New Zealand – public health spending exceeds \$3,000 per capita. Middle-income markets, in particular India and the Philippines, rely much more on out-of-pocket spending from patients in their financing of health care, with an average of 40% of total health spending being out-of-pocket compared to 27% in high-income markets.



Figure 5: Public health expenditure as % of GDP and per capita in US\$, 2018

Cancer accounts for 5-9% of total health spending in high-income markets and only 1-2% (excl. out-of-pocket payments) in some middle-income markets

Limited evidence exists on how much markets spend on cancer care. For markets with available data, health spending on cancer care accounts for 5-9% of total health spending in high-income markets in Asia-Pacific, which is of a similar magnitude as in Europe and the US. Similar proportions have also been reported for China. In Indonesia and Thailand, health spending on cancer care (excluding out-of-pocket payments for cancer treatment) is as low as 1-2% of total health spending.

Insufficient public coverage of medical services and non-medical services means that around 50% of all households affected by cancer face financial catastrophe in most middle-income markets

The consequences of inadequate health coverage can be dire for cancer patients and their families. High out-of-pocket payments for medical services and non-medical services as well as income loss due to reduced or discontinued employment constitute a toxic mix. Indeed, around 50% of all cancer patients and their families face financial catastrophe (here defined as out-of-pockets payments for medical services and non-medical services exceeding annual household income by 30%) in middle-income markets; see Figure 6. An exception is Thailand where "only" a quarter of patients face financial catastrophe, which might be related to well-established universal health coverage granting access to cancer care services at both public and private health care facilities. Even in high-income markets cancer patients may face financial difficulties in conjunction with their diagnosis and care process.



Figure 6: Proportion of households in financial catastrophe due to a household member having cancer

Notes: Financial catastrophe is defined as out-of-pockets payments for medical services and non-medical services exceeding annual household income by 30%. This follows the definition used in the ACTION study that covered many member states of the Association of Southeast Asian Nations.

3. Patient access to innovative cancer drugs

Almost 100 new cancer drugs have been launched over the last decade alone and some are more innovative than others with substantial clinical benefits

New cancer drugs have been introduced at an accelerating pace in recent decades. Almost 100 new cancer drugs have been launched over the last decade alone; see Figure 7. While this is a welcome development for patients, not all drugs offer the same level of innovation and clinical benefits to patients. Value frameworks, such as the Magnitude of Clinical Benefit Scale (ESMO-MCBS) by the European Society for Medical Oncology, have been put forward to help classify cancer drugs with the aim to identify innovative cancer drugs (here defined as ESMO-MCBS score of 4 and 5 or B and A)¹ that should be priorities for rapid reimbursement by national bodies from a clinical perspective.

¹ Drug-indications used in a curative setting receive a score of A, B, or C. A is the highest score and C is the lowest score. Drug-indications used in a non-curative setting receive a score of 5, 4, 3, 2, or 1. 5 is the highest score and 1 is the lowest score. An indication is said to have a "substantial magnitude of clinical benefit" if it receives a score of A or B in the curative setting or a score of 5 or 4 in the non-curative setting. In this report, drug-indications with a "substantial benefit" are called "innovative".

A greater focus on innovative cancer drugs that provide the largest benefit to patients can help constrained health care budgets.



Figure 7: Annual number of new cancer drugs approved by the European Medicines Agency between 1995 and 2020

Of 38 innovative cancer drug-indications approved by the US FDA, around 80% had received regulatory approval across Asia-Pacific, yet only 35% were also reimbursed

Access to innovative cancer drugs through reimbursement is limited in Asia-Pacific. Of 38 innovative drug-indications approved by the US FDA in the treatment of five major cancer types (breast cancer, gastro-esophageal cancer, head and neck cancer, liver cancer, non-small cell lung cancer) between 1998 and 2020, 80% had received regulatory approval across Asia-Pacific in 2020. Yet only 35% of those indications were also reimbursed in 2020; see Figure 8. High-income markets achieve in general much higher rates of both regulatory approval and reimbursement approval than middle-income markets. Among middle-income markets, China, Indonesia, and Vietnam approve relatively few indications but at the same time reimburse a higher proportion of them, and vice versa in the other markets. Among high-income markets, Japan sticks out due to its policy to reimburse all approved drugs essentially by default, which stands in stark contrast to the restrictive reimbursement policy observed in New Zealand. In Singapore, public health insurance schemes enable patients to pay for approved drugs even though they are not listed on a national formulary as in other markets.



Figure 8: Proportion of innovative cancer drug-indications approved/reimbursed relative to US FDA approvals (as of Sep 30, 2020)

Notes: In Singapore, the proportion of reimbursed drug-indications only refers to drugs on the SDL or MAF while patient's expenditure for approved drugs are mostly covered through the 3M schemes. In India, no reimbursement scheme exists for the whole population and drugs listed in the NLEM are considered here instead.

There is a median delay of around 1.5 to 3 years between regulatory approval and reimbursement approval of innovative cancer drugs in highincome markets and China

Timely reimbursement of innovative cancer drugs is a major challenge in Asia-Pacific. In highincome markets along with China, the median delay between regulatory approval and reimbursement approval is around 1.5 to 3 years; see Figure 9. Yet a full assessment of the delay of recent innovative cancer drugs (defined as US FDA approval since 2010) is not possible as reimbursement approval is still pending for many drugs at the data cut-off in 2020. In most middle-income markets, delays could not be assessed, because there are essentially no recent innovative cancer drugs that have achieved reimbursement listing until 2020. This might indicate delays of 10 years or more in most middleincome markets.



Figure 9: Delay between regulatory approval and positive reimbursement decision for innovative cancer drug-indications (in months)

Notes: n/a = no innovative drugs approved or no information on regulatory/reimbursement approval dates available. Analysis based on a sample of 31 drug-indications.

Almost 1 million patient life years are lost for every year of delay in reimbursement of 10 innovative cancer drug-indications across Asia-Pacific

Timely reimbursement of innovative cancer drugs could save countless patient life years across Asia-Pacific. Drawing on a sample of only 10 innovative drug-indications (out of the 31 innovative drugindications with US FDA approval since 2010) across five major cancer types, almost 1 million patient life years are lost for every year of delay in reimbursement; see Figure 10. As delays in reimbursement are typically much longer than one year (except in Japan as noted above), patient outcomes could be greatly improved by faster reimbursement decisions. Reasons for delayed reimbursement of innovative cancer drugs vary across markets in Asia-Pacific. In middle-income markets they relate more to limited public health budgets as well as the organization of the reimbursement process with reimbursement listings being infrequently reviewed and updated. In high-income markets, they relate more to the criteria applied in the reimbursement process (e.g., acceptance of surrogate endpoints, comparator in clinical trial reflective of current clinical practice, cost-effectiveness thresholds) and lack of fast-track systems for innovative drugs (e.g., prioritized process with shorter timelines for drug-indications that lack a comparable alternative as in South Korea).



Figure 10: Proportion (left side) and number (right side) of patient life years lost for every year of delay in reimbursement of 10 innovative indications in five cancer types

Notes: Lung = NSCLC, Gastro-eso = gastro-esophageal cancer, Head & neck = head and neck cancer, Liver = liver cancer, Breast = breast cancer. Japan has only life years lost in breast cancer because there was no delay for other cancer types.

4. Health spending on cancer drugs and unmet patient needs

Cancer drugs are an integral part of modern cancer care. The launch of targeted therapies and immunotherapies has changed the standard of care in many cancer types during the last two decades. While such clinical innovation helps address the growing burden of cancer, this poses challenges to health care systems and policy makers with finite health resources available.

High-income markets spend 10–20% of total pharmaceutical expenditure on cancer drugs, while middle-income markets spend 1–9%

High-income markets in Asia-Pacific spent around 10-20% of total pharmaceutical expenditure – financed via public and private sources – on cancer drugs in 2019, whereas middle-income markets spent around 1-9%; see Figure 11. These proportions directed to cancer are comparatively low in relation to the size of the disease burden of cancer. For example, the proportion of cancer deaths

amounted to around 30% of all deaths in high-income markets and 9-25% of all deaths in middleincome markets in 2019.



Figure 11: Expenditure on cancer drugs as % of total pharmaceutical expenditure, 2019 Notes: Underlying sales data from IQVIA do not fully capture confidential rebates and arrangements granted by drug manufacturers to payers, which would overestimate the proportion of cancer drug expenditure if the size of rebates for

cancer drugs is greater than for other pharmaceuticals.

Total health spending on cancer drugs ranges from \$30 to \$90 per capita in

high-income markets and from \$0.2 to \$6.6 in middle-income markets

Cancer drug expenditure – financed via public and private sources – are low in most high-income markets in Asia-Pacific compared to Europe. Japan spent the most on cancer drugs per capita with over \$90 in 2019, see Figure 12, whereas top-spending countries in Europe spent around \$110–\$130 per capita. South Korea spent the least on cancer drugs among high-income markets with around \$30 per capita, which puts the market at the same level as European countries with lower GDP per capita. Per capita spending levels in middle-income markets ranged from a mere \$0.2 in India to \$6.6 in Thailand in 2019. Higher numbers of cancer patients in high-income markets might explain some of the vast differences across Asia-Pacific. Yet cancer drug expenditure per cancer case were still less than \$600 in India and Indonesia while potentially reaching close to \$18,000 in Singapore. Higher list prices of drugs and higher use of drugs with better patient accessibility via reimbursement might explain some of the remaining differences.



Figure 12: Cancer drug expenditure per capita and per cancer case in US\$, 2019

Notes: Cancer drug expenditure are based on sales data from IQVIA, which are based on list prices, which typically do not fully capture confidential rebates and arrangements granted by drug manufacturers to payers. The absolute numbers reported here are thus upper bound estimates. Cancer case is defined as cancer incidence (newly diagnosed cases), and cases in Singapore might be somewhat underestimated.

Despite higher spending on innovative cancer drugs, even high-income markets may struggle to meet patient needs

High-income markets in Asia-Pacific may struggle to meet patient needs for innovative cancer drugs despite much higher levels of spending and high proportions of reimbursement. For older innovative drugs, most high income-markets seem to meet patient needs (here quantified by a comparison of the drug volume needed to treat all eligible patients with the actual drug volume administered), whereas for newer innovative drugs (such as immunotherapies) this might generally not be the case; see Figure 13. Rigid clinical processes and narrow reimbursement criteria might explain this. In middle-income markets, unmet patient needs hinge crucially on whether or not a drug is reimbursed. Without reimbursement, patients are forced to pay the full price out-of-pocket. This exceeds the financial means of most patients even when generic versions for older innovative drugs are already available, leading to high unmet patient needs and subsequently many life years lost.



Figure 13: Degree of patient needs met based on drug volume needed vs. drug volume administered of pemetrexed in the third quarter of 2020

Notes: n/a = no data on drug volume administered available. NSCLC = non-small cell lung cancer. IO = immunotherapy. Y-scale = 50% means that half of the total drug volume needed to treat all eligible patients was administered. Drug volume needed (in milligram) based on estimated eligible patient numbers, taking into account decreased eligible patient numbers if EGFR/ALK inhibitors and IO monotherapy for high PD-L1 expression are reimbursed as well as standard dosage and treatment length. Drug volume administered based on IQVIA sales data (in milligram).

There is a clear positive association between the level of cancer drug expenditure and cancer patient outcomes

Low spending on cancer drugs and on cancer care in general is alarming. There is a clear positive association between the level of cancer drug expenditure and patient outcomes across markets in Asia-Pacific; see Figure 14. A relationship of this kind does not need to be causal, but it suggests that the amount of spending on cancer drugs – which typically is a strong indicator of expenditure on cancer care services overall – might be an important driver of success in the treatment of cancer. This mirrors previous analyses of the situation in Europe. In order for middle-income markets to start closing the gap on high-income markets and for high-income markets to ensure continued progress in patient outcomes, increased investment in cancer drugs and cancer care in general is required. This should be guided by evidence-based decision-making on the most efficient allocation of resources along the care process to secure the highest benefits to patients.



Figure 14: Total cancer drug expenditure per capita and complement of the mortality-toincidence ratio of cancer, 2018

Notes: The "1 - mortality-to-incidence ratio" is used as proxy for survival, which reflects patient outcomes.

5. Pricing policies for off-patent cancer drugs

Pricing policies for off-patent cancer drugs are not fully effective in many markets

The increasing availability and high cost of innovative cancer drugs together with increasing cancer patient numbers puts financial pressure on the budgets of health care payers. One strategy to balance constrained budgets with patient access to new innovative cancer drugs lies within off-patent pricing mechanisms of older cancer drugs. Once a patent expires, market exclusivity is lost, and generic copies of the originator can enter the market. This stimulates competition between manufacturers and should cause the price of the originator drug to fall. Policies surrounding off-patent pricing mechanisms will affect the magnitude of price decreases of originator drugs, and larger price drops could generate substantial savings. In general, markets in Asia-Pacific react as anticipated with prices of originator drugs overwhelmingly falling after patent expiry (or loss of exclusivity); see Figure 15 for an example. Yet the magnitudes of these price drops vary substantially across drugs and markets, suggesting further efficiency that can be achieved in the health system.



Figure 15: Mean change in list price pre/post patent expiry (or loss of exclusivity) of small-molecule cancer drugs in high-income markets

Notes: Eight major small-molecule cancer drugs with patent loss between 2010 and 2020 were included in the analysis. Quarter 0 refers to the quarter during which a drug's patent expired or (if the former information was not available) to the quarter during which the first generic version received regulatory approval or started being sold.

Effective pricing policies for off-patent cancer drugs could free up substantial resources for re-investment in new innovative cancer drugs

If more effective off-patent pricing mechanisms were adopted, markets in Asia-Pacific could achieve lower prices of originator drugs post patent expiry or loss of exclusivity. This could generate substantial savings. Drawing on a limited sample of 11 major cancer drugs with patent loss between 2010 and 2020, estimates indicate that the potential savings range from 3% to 20% of total cancer drug expenditure; see Figure 16. In middle-income markets where access to originator drugs is low, price drops associated with effective off-patent pricing mechanisms would likely trigger increased sales volumes, thus compounding the savings. Patent expiry should be viewed as an opportunity where effective policy can improve access to drugs and free up resources, thus creating budget headroom for reimbursing new innovative drugs. Ultimately, an effective re-channeling of resources from off-patent drugs to new innovative drugs could offer a more sustainable financing model of innovative drugs.



Figure 16: Estimated savings from more effective off-patent pricing outcomes of 11 cancer drugs as a proportion of total expenditure on all cancer drugs

Notes: No data available for India. Effectiveness is here defined as achieving the lowest possible price for the originator drug after patent expiry or loss of exclusivity. The analysis is based on list prices, which typically do not fully capture confidential rebates and arrangements granted by drug manufacturers to payers.

Call to action

Cancer is a growing challenge for health systems that requires political leadership across markets in Asia-Pacific. Instructive examples from other parts of the world are the Nixon administration's "*War on Cancer*" in 1971 in the United States or the Delors Commission's first "*Europe Against Cancer*" program in 1987 and the von der Leyen Commission's "*Europe's Beating Cancer Plan*" in 2021 in Europe. Policy makers in Asia-Pacific can learn from these examples and start prioritizing effective and comprehensive cancer control efforts to address the many challenges ahead. To this end, the WHO advocates National Cancer Control Programs to tackle cancer in a strategic way.

This report provides the following lessons learned:

- 1. The burden of cancer is growing, and a two-fold strategy is needed to tackle it. First, prevention efforts addressing major risk factors need to be reinforced to reduce the number of newly diagnosed cancer cases. Second, treatment provision needs to be improved to enable patient access to equitable and high-quality care to improve survival.
- 2. Success in the treatment of cancer is associated with the amount of spending on cancer drugs and more generally also with the amount of spending on health care and cancer care. Access to modern cancer treatment is limited in many markets in Asia-Pacific today. This is the result of a lack of universal health coverage, a small package of health services covered, high patient co-payments on covered health services, or a combination thereof. The root cause of this is insufficient public funding of health care.
- 3. Increased public spending on cancer care is needed to protect patients from financial hardship and to save lives. Reimbursement of cancer drugs is key for the vast majority of patients to gain access and to meet their clinical needs. Without reimbursement, patients are forced to pay the full price out-of-pocket. This exceeds the financial means of most patients even in cases when generic versions for older innovative drugs are available.
- 4. The recent wave of cancer drugs offers new treatment options for many patient groups. Not all drugs are equally effective and an increased focus on innovative drugs with the greatest clinical benefits to patients is needed. Use of health technology assessment can support evidence-based decision-making in reimbursement and allocation of constrained health resources to maximize patient outcomes.
- 5. Increasing efficiency in health systems deserves greater attention. For example, more effective measures are needed to stimulate competition between generic producers and to control prices of originator drugs after patent expiry. This can create considerable budget headroom, which can be reinvested in innovative cancer drugs that offer substantial clinical benefits to patients.

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As an independent research institute, working multidisciplinary with a broad array of public and private clients, IHE aims to contribute to sound decisionmaking in the health care setting by bridging the gap between academia, the life science sector and health care providers.

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