The Economist Intelligence Unit

Controlling cancer

The state of national cancer control plans in Asia

A report from the Economist Intelligence Unit

Commissioned by

mundipharma

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About the research

With half the global incidence of cancer, Asia is facing a challenge that will put enormous stress on healthcare systems. This stress will be felt not only in developed countries in the region but increasingly in the less developed nations. Most governments recognise the coming cancer challenge in Asia and are developing national cancer control plans which set out the strategic public health response to the disease.

This report, *Controlling cancer: The state of national cancer control plans in Asia*, written by the Economist Intelligence Unit (EIU) and commissioned by Mundipharma, seeks to assess in a qualitative manner the extent and efficacy of such plans. It also aims to identify best practices that might be shared to improve control plans.

The report draws on in-depth desk research and interviews with the following healthcare officials and experts in 10 representative countries of high, medium and low income:

Professor Sanchia Aranda, president-elect, Union for International Cancer Control

Professor Jim Bishop, executive director, Victorian Comprehensive Cancer Centre, former chief medical officer, Australia

Professor Chien-Jen Chen, vice president, Academia Sinica

Dr Wanqing Chen, director, National Central Cancer Registries China, deputy director, National Office for Cancer Prevention and Control

Professor James Cleary, associate professor of medicine, University of Wisconsin

Dr Ednin Hamzah, CEO, Hospis Malaysia

Dr Weerawut Imsamran, director, National Cancer Institute, Thailand

Dr Brenda Kostelecky, health science policy analyst, US National Cancer Institute Centre for Global Health

Dr Nila Moeloek, minister of health, Indonesia

Dr Malcolm Moore, editor-in-chief, *Asian Pacific Journal of Cancer Prevention*

Professor Ian Olver, director, Sansom Institute for Health Research, University of South Australia

Dr Rengaswamy Sankaranarayanan, head, Screening Group, International Agency for Research on Cancer

Dr Saunthari Somasundaram, president, National Cancer Society Malaysia

Dr Tran Van Thuan, deputy director, National Cancer Hospital, Vietnam

Dr Ted Trimble, director, US National Cancer Institute Center for Global Health

Professor Keun-Young Yoo, honorary president, National Cancer Center, Korea

The report was written by Paul Kielstra and edited by Charles Goddard and Charles Ross. We would like to thank all interviewees for their time and insight.

Executive summary

Cancer is a common and increasingly worrying enemy in the 10 countries covered in this study: Australia, China, India, Indonesia, Malaysia, Myanmar, South Korea, Taiwan, Thailand and Vietnam. The nature of the challenge it represents, however, and how healthcare systems are responding, varies greatly by geography. This Economist Intelligence Unit study, sponsored by Mundipharma, considers in detail the cancer-related commonalities and differences in the region, in particular the content and implementation of National Cancer Control Plans (NCCPs). Its key findings include:

In developed countries cancer is a leading killer and in developing ones it is catching up at an alarming rate.

For many years now, the proportion of deaths attributable to cancer in Australia, South Korea and Taiwan has been between 25% and 30%. Although not nearly so high in the less wealthy countries in this study, the burden of cancer is growing rapidly throughout the region. The crude death rate from the disease in China, Myanmar, Thailand and Vietnam rose by over 30% between 2000 and 2012, and in China is now roughly similar to that of South Korea.

Four drivers are, to varying degrees depending on the country, increasing cancer rates in much of the region:

1. *Population ageing:* The proportion of the population over 65 was below 6% in most of the countries in this study as late as 1985. By 2040, it will be over 20% in half of them and greater than 10% in all. Already, the difference in crude and age-standardised incidence rates helps explain much of the increasing number of cancer cases that doctors face. As populations age further, this is likely to increase.

2. *Lifestyle choices:* Although across the region efforts to control tobacco made some early progress, in most countries little change in smoking rates—which are particularly high among males—has occurred since 2006. Meanwhile, a combination of dietary change and decreased physical activity has raised the number of overweight and obese individuals, bringing marked rises in cancer risk.

3. *Environmental pollution:* Air and water pollution in countries with rapidly growing economies are exacting an increased cancer burden. High-incidence locations, so-called "cancer villages", are the most prominent manifestation, but the problem is more widespread. According to the World Health Organization's (WHO) Global Burden of Disease data, 1.7% of all deaths in China in 2010 resulted from air-pollution induced cancers.

4. *Ongoing infectious disease:* High rates of hepatitis in the region help explain widespread incidence of liver cancer in many of the countries in this study, and human papillomaviruses are the leading cause of cervical cancer. Similarly, at a more local level, the prevalence of helicobacter pylori infection in Korea drives its high rate of gastric cancer, and liver fluke accounts for much of the liver cancer in Thailand.

The need for a plan: Money helps in the fight against cancer.

In our study, the three countries most successful at fighting cancer—as measured by comparing the number of five-year survivors with overall incidence—are also the wealthiest. Looking more closely, though, how the money is spent also matters. A study by the Organisation for Economic Co-operation and Development (OECD) found that, among developed states, the quality of governance around cancer control alone accounted for a quarter of the difference in outcomes. In our study, Thailand—with an extensive, detailed NCCP—does better than Malaysia and China, even though the latter two have higher GDP per capita.

A number of common weaknesses amid great diversity: Cancer control varies widely by geography, but several common, albeit not universal, weaknesses appear frequently, indicating areas where action is necessary.

- *A need for more and better data, and evidence-based policy*: Effective decision-making requires an understanding of the challenge that cancer represents, but only a minority of countries in this study have high-quality registry and mortality data.

- *A need for a more holistic approach to cancer care*: Most countries in this study fail in some way to provide comprehensive services across the entire range of cancer control. Perhaps ironically, some of the poorest, notably Vietnam and Myanmar, tend to focus on expensive treatment facilities while paying much less attention to earlier and less costly interventions; wealthier countries, such as South Korea and Taiwan, on the other hand, may have extensive screening programmes but have ongoing weaknesses in prevention; all, outside of Australia, Malaysia and Kerala state in India need to integrate effective palliative care into their overall provision.

- *A need to engage more with those outside the health system*: This takes two forms. The first is winning over the population to the very idea of modern cancer control. In the majority of the countries covered in this study, poor understanding of the risks of cancer or potential treatment options, often exacerbated by cultural assumptions about the disease, lead to, *inter alia*: the adoption of behaviour with high health risks; the failure to take up screening opportunities; the use of traditional medicines which have little, if any, efficacy against cancer; and late presentation for treatment or of not using medical services at all. The other area where greater engagement is needed is to bring a wider range of stakeholders into the battle against cancer. These have proved critical to success in many countries, but in Asia—outside of Australia, Thailand and Indonesia—cancer control remains very much a health system concern.

- *A need to consider appropriate legal foundations*: Two countries in this study, Taiwan and South Korea, have formal cancer control legislation which can bring a range of advantages from providing secure budgets to helping overcome obstacles to data usage. The utility of such an approach will vary but as health systems seek to provide effective cancer control, governments should consider how formal laws might help.

Ten countries in this study provide 10 distinct cancer control stories: The cancer challenge, and how countries have responded, is highly heterogeneous in this region.

In summary, the findings are:

- *Australia:* Australia has among the highest overall cancer incidence figures in this study but

its cancer control programme is also one of the best. The latter combines a holistic approach—including effective prevention (notably in the fields of tobacco control and HPV vaccination), screening and treatment—with evidence-based strategies, multi-stakeholder involvement and the economic resources available to a rich country to shape an effective response to the disease.

- *China:* With some 20% of the world's population, China already has 27% of the world's cancer mortality. It has also been seeing a substantial increase in cancer rates from types of the disease usually associated with greater wealth, along with ongoing high rates of cancers more common in less developed countries. For many years, efforts against the disease have been sparse, but more recently the government has begun to invest substantial funds into cancer control. This is particularly evident in the country's rapidly expanding and improving registry network. Other elements of cancer control remain weak, though, with, for example, tobacco control ineffective, very little screening, treatment too expensive for many even where accessible, and palliative care rarely available.

- *India:* Although India has a lower cancer incidence than any country in this study, it has very high mortality rates even compared to other developing countries. Moreover, indications are that incidence is set to grow. On paper, India has had a comprehensive cancer control plan since the 1970s. In practice, very little of it has ever been implemented. Although the country has a good registry programme for a developing country, prevention is poor, screening opportunistic, and treatment facilities are insufficient and generally inaccessible to the poor. In general, palliative care is also rare, except in Kerala state which has a deservedly high reputation in this specialised area.

- *Indonesia:* Currently, Indonesia is performing poorly at cancer control: data is scant, prevention efforts and screening weak, and treatment facilities insufficient for the need, especially as a majority of patients present at a late stage. Change, however, may be at hand. The government and leading stakeholders have signed a National Commitment Against Cancer, and a new, comprehensive NCCP covering 2015-2019 has been put in place with a range of goals across every area of cancer control. New programmes are also being rolled out, notably a national cervical cancer screening effort announced in April 2015. These build on one of Indonesia's rare strengths in this field, its unusually high level—for the region—of stakeholder involvement in cancer control.

- *Malaysia:* Malaysia's record on cancer control is the most difficult to assess of any country in this group. On the one hand, it has notable weaknesses: the country is secretive about its NCCP, which remains an internal health ministry document; in 2007 it shut down its national registry and now lacks comprehensive data; early detection and screening are opportunistic; education and prevention efforts have made little headway against widespread ignorance about the disease and cancer fatalism. On the other hand, the country has made substantial investments into cancer treatment facilities and is working with universities to train more oncologists; along with Australia it is the only country with a widespread HPV vaccination programme; and it has some of the best palliative care in the region. Malaysia has shown that it can excel in aspects of cancer control, but health officials need to work with other stakeholders on a more holistic approach.

- *Myanmar:* Given its recent history and level of economic development, Myanmar's cancer control is predictably weak. Although the government has told the WHO that it has an NCCP, little evidence of the plan exists on paper. Data is poor, prevention efforts are rare in practice, and access to treatment low. On the other hand, signs exist that the government wants to improve. It has invested heavily, for a country of its wealth, in modern treatment facilities and has been working with a variety of stakeholders on

a national programme to fight cervical cancer. Broader progress will depend on how effectively the government can use the resources it is willing to bring to bear.

- *South Korea:* Cancer has been the leading cause of death in South Korea since 1983. From 1996 on, the country has put in place strong anti-cancer measures with an NCCP based on specific national legislation. South Korea is particularly strong in the fields of cancer registration, early detection, and treatment. The result of these efforts has been a marked increase in cancer survival rates. On the other hand, prevention remains a weak point: over 40% of men are still smokers, and high rates of gastric cancer arise from widespread, but treatable, helicobacter pylori infection. Similarly, palliative care and survivor support require further attention.

- *Taiwan:* Taiwan has for many years benefited from a comprehensive NCCP with strong political and legislative backing. It has a long-standing registry, a variety of prevention efforts (including one of the oldest HBV vaccination programmes), extensive—if not always ideally targeted—screening programmes, and advanced treatment facilities. Overall, however, age-standardised mortality rates for cancer in the country have risen very slightly over the last two decades even as those for other major non-communicable diseases (NCDs) have dropped markedly. The main problem seems to be that a lack of knowledge about cancer dangers in the population and cancer fatalism are leading to ongoing high levels of risk-associated behaviour and low uptake of screening opportunities.

- *Thailand:* Outside of the wealthiest countries in this study, Thailand has the most advanced and comprehensive cancer control programme. It has very good registries, as well as extensive prevention and early detection efforts. Universal healthcare helps address some cancer-care access issues. On the other hand, constrained resources inevitably have some effect: HPV vaccination is still deemed not cost-effective, for example, and treatment facilities remain insufficient for the country's needs. Palliative care is also weak, although recent government initiatives suggest that this may improve soon. Overall, though, Thailand's high five-year prevalence figures compared to other countries at a similar level of development show that good policy can stretch limited budgets.

- *Vietnam:* Vietnam has a large and growing cancer burden but is not addressing it effectively. Although it has had an NCCP since 2007, a lack of funding has meant that little of it has been implemented. The country has a few good treatment facilities, but these are overwhelmed by demand, especially as weak prevention and early detection programmes combine to drive frequently late presentation by those with the disease. Finally, palliative care is limited.

1 Cancer in Asia: A substantial problem for many countries

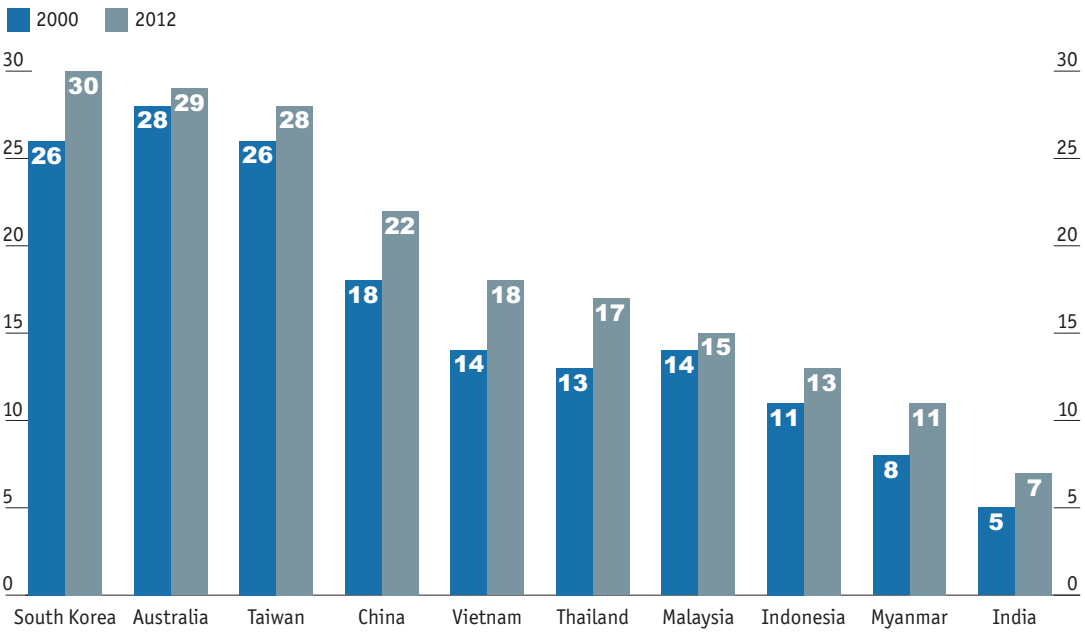
There is no single overarching story of cancer control in the Asia-Pacific region, nor even a small number of stories describing common paths which groups of similar countries have taken. "It is highly heterogeneous," says Rengaswamy Sankaranarayanan, head of the Screening Group at the International Agency for Research on Cancer (IARC), when speaking of the nature and extent of early detection and treatment in different Asian states. He could equally have been talking of underlying risks, prevention efforts, or even morbidity and mortality rates. When looking at cancer and its control, the 10 countries covered in this study—Australia, China, India, Indonesia, Malaysia, Myanmar, South Korea, Taiwan, Thailand and Vietnam—each have their own tale to tell and lessons to provide.

One reality they all share, however, is that none can safely ignore the disease, albeit for different reasons. As Figure 1 shows, the proportion of all deaths attributable to cancer in the three most economically developed countries—Korea, Australia and Taiwan—has been over 25% for more than a decade. And in all 10 countries, the proportion has been growing.

Figure 1

Cancer growth in Asia

Percentage of deaths attributable to cancer



Source: WHO estimates, Taiwan Ministry of Health and Welfare, EIU calculations

While these shifts of a few percent in the proportion of total mortality may seem small, in absolute numbers they are large. In each of China, Myanmar, Thailand and Vietnam, the crude death rate—which does not account for age differences in populations—from all cancers increased by more than 30% between 2000 and 2012. In India it rose by 22%. Moreover, in some of the less-developed countries, high numbers of deaths from other conditions reduce the relative burden of cancer, but in absolute terms it is just as worrying as in wealthier states. China and Korea, for example, have very similar crude death rates (159 per 100,000 in 2012 in the former; 164 in the latter).

Looking ahead, the burden of cancer appears set to grow further. For Asia as a whole, the IARC projects that between 2008 and 2030, incidence of the disease will rise by roughly 75%, from 6.1m annually to 10.7m, and mortality will increase at a slightly faster rate, from 4.1m to 7.5m per year. This compares with UN projections for population growth of only 20%. Most of this added cancer burden will occur in lower- and middle-income countries.[1]

A diverse range of drivers

The risk factors behind cancer can be almost as diverse as the specific cancer sites and variants of the disease itself. A few general ones, however, stand out:

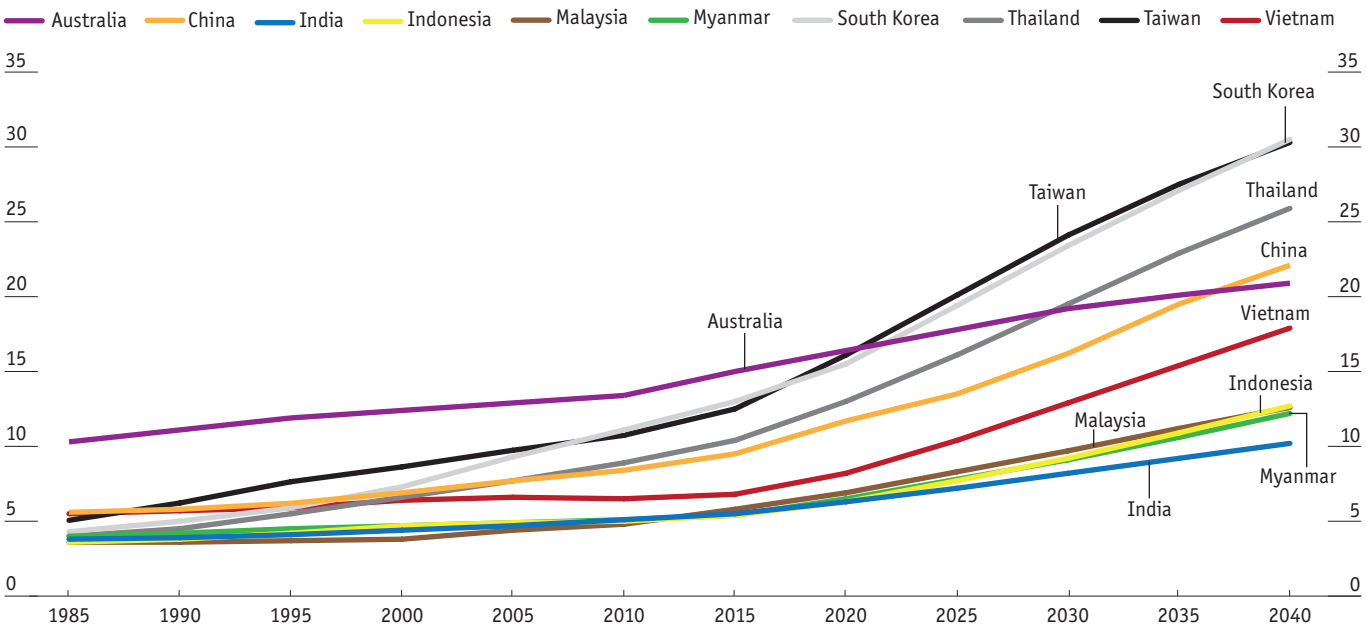
1. Population ageing: According to UN Population Division data, as late as in1985, in nine of the countries in this study the proportion of the population over 65 years old was between roughly 3.5% and 5.5%. Today, in five of the 10 this figure is near or above 10%. By 2040, all will be above that level. Thailand, Australia and China will have more than 20% over 65; and in Korea and Taiwan the number will be over 30% (figure 2).

[1] Rengaswamy Sankaranarayanan et al., "Managing the Changing Burden of Cancer in Asia," *BMC Medicine*, 2014.

Figure 2

The age factor

Percentage of population over 65 years old



Source: UN Population Division, Taiwan National Development Council

Age is a risk factor common to many cancers and its impact is already being felt. Jim Bishop, executive director of the Victorian Comprehensive Cancer Centre and former chief medical officer for the Australian Government, estimates that ageing in Australia "has put more individuals in the 'at risk' age group and this accounts for around 60% of the increase in cancer numbers we have projected". Australia currently has the highest proportion of the population over 65. Yet even in Indonesia, a country where the change has been slower, Nila Moeloek, the health minister, points out that ageing is one of the leading drivers of increased NCDs of all kinds there.

Perhaps the most striking indication of the likely impact of ageing is the effect it has already had on mortality. Figure 3 shows the change between 1990 and 2010 in both the all-age mortality rates from cancer and the age-standardised rates. The former are the actual burden that countries and their health systems face; the latter are what they would need to deal with if the country had a notionally average age structure. As the figures indicate, over the past two decades, in every country but Thailand the age-standardised numbers have actually declined or grown only slightly. On the other hand, the unadjusted reality shows a substantial rise in the number of cancer deaths. As aging accelerates, without action, so too will this growth.

2. Lifestyle: Unhealthy lifestyle decisions are behind any number of cancers. The most important of these in Asia are tobacco consumption, diet and lack of physical activity.

The leading issue in the region is tobacco. Over the long term, the picture is largely positive: between 1980 and 2012, the percentage of adults who smoke declined in every country in this study except Indonesia. On the other hand, progress seems to have stalled more recently: between 2006 and 2012, in nine of the 10 countries—the exception was India—the annualised rate of decline was lower than that of the preceding decade, although the drop in Australia continued to be marked. Moreover, in China, Thailand and Indonesia the proportion of adults smoking actually rose between 2006 and 2012, and in Malaysia the change, though in the right direction, was minimal.[2]

Currently, Australia, India, Myanmar and Taiwan are below the global average for the percentage of adults who smoke. The last three, though, have substantial health problems from extensive chewing of tobacco or of betel nuts,

[2] EIU calculations based on data from database created for Marie Ng et al., "Smoking Prevalence and Cigarette Consumption in 187 Countries, 1980-2012," Journal of the American Medical Association, 2014, available at http://ghdx.healthdata.org/record/global-smoking-prevalence-and-cigarette-consumption-1980-2012

Figure 3: The effects of ageing

All-age and age-standardised cancer mortality
(per 100,000 population)

	All-age mortality			Age-standardised mortality		
	1990	2010	% change	1990	2010	% change
Australia	188.2	208.2	11%	152.1	122.7	-19%
China	131.7	159	21%	170	148	-13%
India	49.6	54.1	9%	84.6	75	-11%
Indonesia	52.6	74.1	41%	93.4	97.9	5%
Malaysia	54.4	65.3	20%	103.8	95.6	-8%
Myanmar	75.8	91.2	20%	125.4	118.7	-5%
South Korea	125.5	179.2	43%	174.8	134.9	-23%
Taiwan	100.2	177.7	77%	126.1	132.9	5%
Thailand	68	142.1	109%	99.2	126.4	27%
Vietnam	77.8	104.1	34%	125.4	126.4	1%

Source: Institute for Health Metrics and Evaluation (IHME). GBD Compare, 2013, http://vizhub.healthdata.org/gbd-compare, EIU calculations

with the two substances often used together. The practice can be just as dangerous as smoking but affect different parts of the body. According to Globocan, an IARC cancer database, in 2012 India's age-standardised incidence of lung cancer was under a third of the global figure; that for mouth and pharynx cancer was close to double the world rate. Another notable characteristic of smoking in most of Asia is that it is an overwhelmingly male activity. This helps drive the much higher lung cancer incidence observed among men in most countries in this study. It also partly accounts for the higher overall levels of cancer mortality among males as lung cancer is a particularly deadly form of the disease.

Governments and individuals in the region know that tobacco is highly carcinogenic. Of the countries covered here, all but Indonesia and Taiwan ratified the Global Framework Convention on Tobacco Control over a decade ago—and Taiwan tried to participate but was blocked by China. All too often, however, the aims of the convention are not being vigorously pursued. As Sanchia Aranda, president-elect of the Union for International Cancer Control, puts it, "There is an awareness, but what is missing is sufficient support from governments to put in place what needs to be put in place."

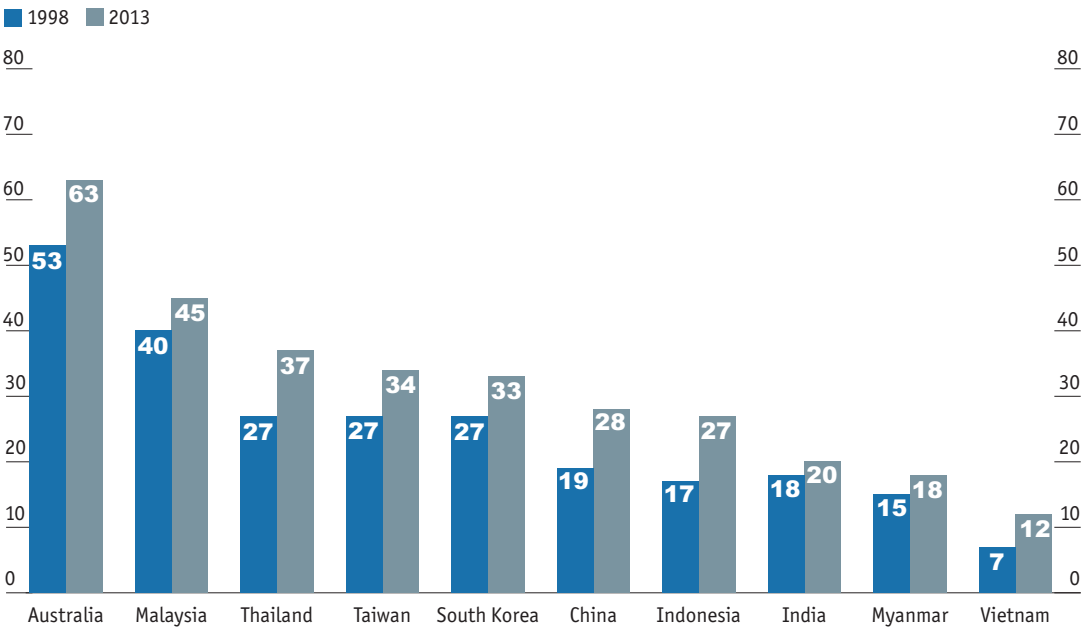
While tobacco is a long-standing lifestyle problem, unhealthy changes to diet and low levels of physical activity are causing ever increasing health damage. This is most visible at the waistline. Although traditionally low in Asia, the proportion of people who are overweight or obese has been increasing in recent years in both developed and developing countries (figure 4).

The risks which diet, low exercise and excess body fat pose for heart disease and diabetes are well known in Asia. However, notes Ted Trimble,

Figure 4

Bulging waistline

Percentage of population who are overweight or obese (BMI > or equal to 25.0)



Source: Data from database created for Marie Ng et al., "Global, regional, and national prevalence of overweight and obesity in children and adults during 1980–2013: a systematic analysis for the Global Burden of Disease Study 2013," *The Lancet*, 2014 available at http://vizhub.healthdata.org/obesity/.

director of the US National Cancer Institute Center for Global Health, "We need to do more education [in the region] in terms of the link between obesity and cancer." Too much weight brings heightened risk of various cancers, most notably colorectal, breast, and prostate. Long-term studies have found that the first of these has tended to become more common with economic development, in part because increased income has led to individuals eating more and exercising less.[3] More alarming still in this context, other research indicates that, as with diabetes and heart disease, fat poses a higher cancer risk for individuals of Asian genetic extraction than those of Caucasian descent.[4]

3. Environmental pollution: Another growing, cancer related-problem in much of Asia has been pollution, in particular of air and water, associated with much of the region's recent rapid economic development. At a local level this can be particularly harmful: both Vietnam and China, for example, have in recent years acknowledged a substantial number of so called "cancer villages" with significantly raised incidence of the disease arising from such pollution. The issue can also affect wider areas: in 2013, oncologists in Hyderabad, India estimated that air pollution was a major cause of lung cancer in 20% of cases of the disease.[5] More broadly, analysis of the WHO's Global Burden of Disease study suggests that, in 2010, ambient air pollution killed nearly 140,000 people in China through inducing some form of cancer, accounting for 1.7% of all deaths. Nor are wealthier countries exempt. Although the equivalent absolute figure for South Korea was much smaller, cancer from air pollution still led to an estimated 1.1% of that country's mortality in 2010.

4. Ongoing chronic infections: A number of chronic infections are associated with specific cancers. Among the most common, hepatitis B and hepatitis C are the leading causes of liver cancer; human papillomaviruses (HPV) are responsible for almost all cervical cancer and can cause cancer at other sites; and helicobacter pylori is the dominant identified cause of gastric cancer.

Not all such diseases may be appropriate for public health interventions. Helicobacter pylori, for example, affects more than half of all human beings and, where it causes discomfort, can be dealt with through antibiotics for the individual affected. Long-term trials of the cost-effectiveness of population-wide prevention schemes are ongoing.

Vaccinations against other infections, however, are clearly able to reduce the cancer burden. Notable progress has been made against Hepatitis B. The annual immunisation rate of new-born children against the disease has been above 90% for most of the past five years in every country in this study except Indonesia, Myanmar and India—and even these have seen this figure increase recently. On the other hand, the region has to live with the ongoing burden of those who were not vaccinated while young. According to WHO data, China alone has about one-third of all chronic cases of hepatitis B in the world, helping explain why it has one-half of all liver cancer deaths. Hepatitis C, meanwhile, although curable, has no vaccine and is also more common in the Asia-Pacific region than elsewhere in the world.

HPV vaccines have also been introduced in a number of countries. Australia was one of the first countries to offer a widespread programme and is already seeing declines in prevalence of the associated, potentially carcinogenic viruses. Malaysia has also introduced widespread HPV immunisation. These, however, are the exceptions. Although the vaccines are available and recommended by health authorities in Korea and Taiwan, no large-scale vaccination programmes exist there, nor in any of the other jurisdictions covered by this study. In the less-developed countries, this is due to cost. As such, believes Professor Aranda, "HPV vaccination is one big area that needs emphasis. Cervical cancer

[3] Fatima Haggar and Robin Boushey, "Colorectal Cancer Epidemiology: Incidence, Mortality, Survival, and Risk Factors," *Clinics in Colon and Rectal Surgery*, 2009; Melissa Center et al., "International Trends in Colorectal Cancer Incidence Rates," *Cancer Epidemiology & Biomarkers Prevention*, 2009.

[4] Andrew Renehan et al., "Body-mass Index and Incidence of Cancer: a Systematic Review and Meta-analysis of Prospective Observational Studies," *The Lancet*, 2008; Alvin Lee and Sing Joo Chia, "Prostate Cancer Detection: The Impact of Obesity on Asian Men," *Urologic Oncology*, 2015.

[5] "20% Lung Cancer Caused by Air Pollution," *The Times of India*, 12 November 2013.

is so preventable and you have so many women in developing countries developing the disease."

Toward effective cancer control: The need for a programme

Cancer is neither inevitable nor untreatable. A more than decade-old WHO estimate, made conventional wisdom through general and frequent repetition, holds that roughly one-third of cancers could be prevented and another third treated successfully if detected early enough.

Success against the disease, however, varies markedly by country. Figure 5 shows national age-standardised incidence and mortality figures for all cancers in 2012, as well as the five-year prevalence rate. The latter is a measure of the proportion of the population which has lived for that period with a cancer. The table also includes the ratio of such long-term survivors to the 2012 incidence as an (admittedly rough) indication of how well health systems are able to treat the cancer burden they face.

A number of things are immediately striking. One is that incidence and mortality do not always correlate. At the biggest extreme, of the 10 countries, Myanmar has a below average number of women developing cancer but the highest rate of women dying from it. The country is a problematic example, because of its data quality. Nevertheless, the outcome is consistent with a frequently observed pattern of lower incidence but higher mortality in developing countries compared to wealthier ones.

Money, then, matters. But as the list shows, this is true only up to a certain point. Australia, South Korea and Taiwan do best in terms of long-term survival, but Thailand comes fourth, with a real GDP per capita below that of China and Malaysia.

How cancer is fought can be as important as the resources available for the task. A recent OECD study found that the quality of governance of efforts against the disease—in particular the existence of monitored national objectives and targets with stated time frames, quality assurance mechanisms, and integrated case management—accounted for about one-quarter of the difference in health outcomes among the developed countries it considered.[6]

Cancer experts have increasingly recognised the importance of governance in recent years. In particular, since the 1990s, the WHO has advocated the creation of National Cancer Control Programmes (NCCP), which it describes

[6] *Cancer Care: Assuring Quality to Improve Survival*, 2013. It used these factors as a proxy for the existence of a National Cancer Control Programme.

Figure 5: How effective is cancer care?

Age-standardised incidence and mortality, and prevalence
(per 100,000 population)

	Incidence		Mortality		Five-year prevalence		Prevalence/Incidence	
	Male	Female	Male	Female	Male	Female	Male	Female
Australia	374	279	115	80	2,165	1,698	5.8	6.1
South Korea	340	294	146	65	1,380	1,662	4.1	5.7
Taiwan	339	255	169	95	1,268	1,313	3.7	5.1
Thailand	150	129	114	77	444	582	3	4.5
China	211	140	165	83	440	473	2.1	3.4
Malaysia	145	143	92	80	299	471	2.1	3.3
Indonesia	136	134	104	79	264	450	1.9	3.4
Myanmar	149	135	129	100	262	381	1.8	2.8
Vietnam	173	114	148	76	271	341	1.6	3
India	92	97	70	60	147	263	1.6	2.7

Source: Globocan 2012, Taiwan Ministry of Health and Welfare. Figures for 2012, except Taiwan (incidence for 2013, mortality for 2011). EIU calculations

as "a public health programme designed to reduce the incidence and mortality of cancer and improve the quality of life of cancer patients in a particular country or state, through the systematic and equitable implementation of evidence-based strategies for prevention, early detection, treatment, and palliation, making the best use of available resources."[7]

Such a programme may take any number of structural forms—such as a single, overarching policy or a variety of interdependent ones; and be led in any number of ways—by, for example, a ministry of health, a national cancer institute or a specially-created committee. Whatever the particulars, an NCCP should be comprehensive, evidence-based, goal-oriented and make the most of partnerships between relevant stakeholders. As Dr Trimble explains, "A national cancer control plan will make clear that the country needs all of cancer education, prevention, screening, treatment, symptom management, survivorship, health surveillance and so on, not just one piece of the puzzle. A plan will also help avoid duplication of effort and encourage stakeholders to work with one another."

The evolution of NCCPs has been slow and uneven across the world. In Europe, for example, although Germany had the first such programme, introduced in 1979, most were started only in the past 15 years and, as late as 2012, five European Union countries had nothing even resembling a comprehensive programme or strategy. Moreover, analyses of the various NCCPs on that continent quickly turn to the word "heterogeneous" to describe their diverse content and degree of implementation.[8]

This study takes a qualitative look at the NCCPs of 10 Asia-Pacific countries. The history here is even longer than in Europe: India's first national cancer control programme was launched in 1975. Programmes and plans have also spread to every country in the group: nine reported to the WHO in 2010 that they had a programme while Taiwan's was already long-standing by that date.

What this means in practice, however, is another matter. As Dr Trimble notes, cancer control in Asia is similar to rest of world. "Some countries have really made great strides; others have a plan but are struggling to put it into effect; others are putting a programme together." An EIU overview analysis of the plans supports his impression. The chart shows our assessment of the ten plans based largely on criteria developed jointly by the WHO and the International Atomic Energy Agency.[9] As Figure 6 indicates, no country lacks opportunity for improvement and the specific strengths vary widely.

This assessment, however, focuses on the key elements of NCCPs as they exist on paper, less as they are carried out in practice. Accurate costings and formal provision of an accompanying budget are often lacking in the region. Finally, even the availability of NCCPs for public scrutiny is not universal. Myanmar's may not even exist and Malaysia's Ministry of Health is notoriously secretive about cancer strategy and data: its plan is an internal policy only. As Dr Saunthari Somasundaram, president of that country's National Cancer Society notes, "It is difficult to assess how well the policy is working when many of the stakeholders don't know what the policy is in the first place."

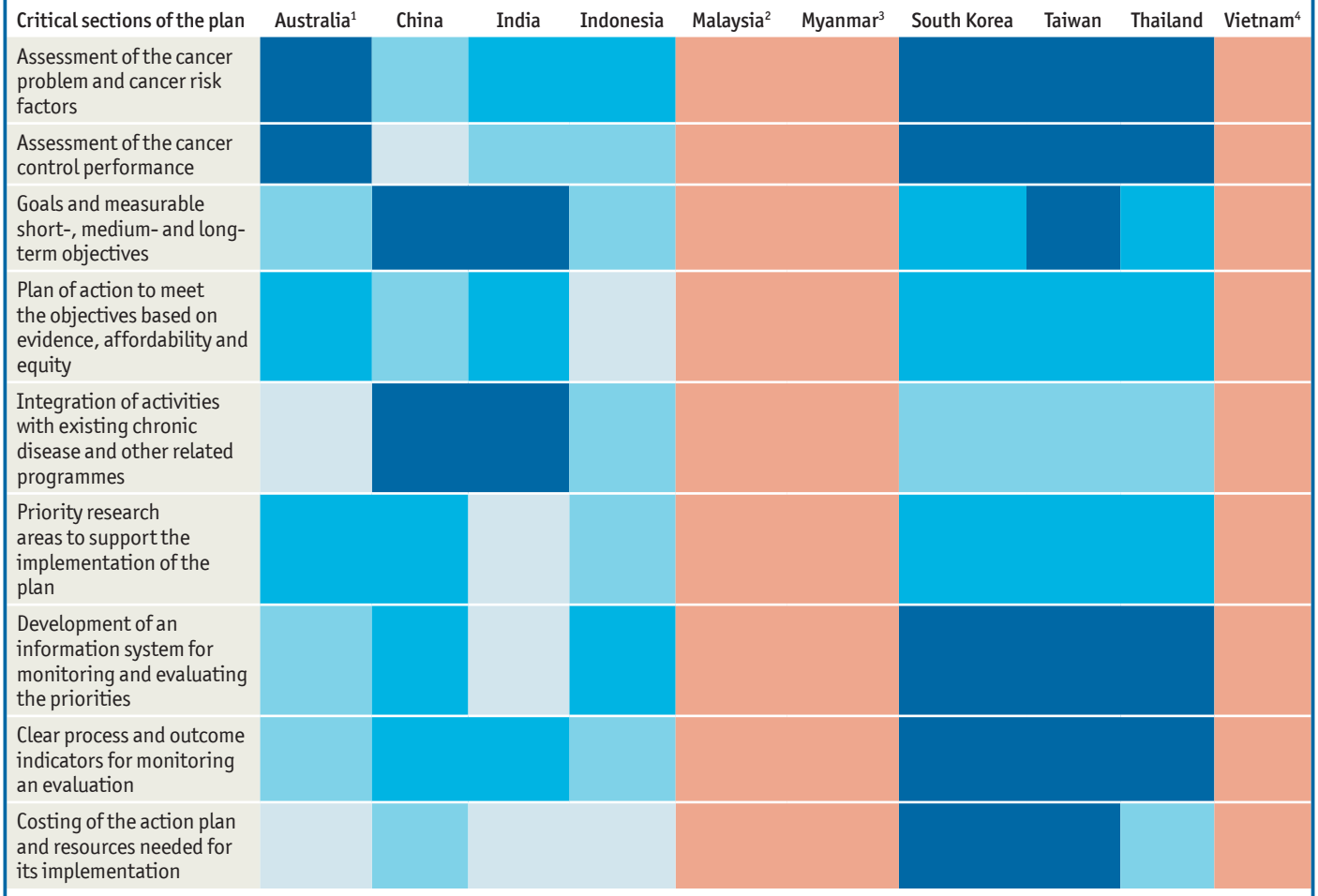
A better understanding of the state of cancer control in the Asia-Pacific region accordingly requires qualitative examinations of both policies—where discernible—and practice in individual countries.

[7] WHO, *National Cancer Control Programmes: Policies and Managerial Guidelines*, 2002.

[8] Rifat Atun et al., *Analysis of National Cancer Control Programmes in Europe*, 2009; Lydia Gorgojo et al., "National Cancer Control Programmes: Analysis of Primary Data from Questionnaires—Final Preliminary Report," *European Partnership for Action Against Cancer* report, 2012; OECD, *Cancer Care: Assuring Quality to Improve Survival*, 2013

[9] *National Cancer Control Programmes: Core Capacity Self-assessment Tool*, 2011.

Figure 6: Asia's report card: Room for improvement



Key

- Not Addressed: Item was not mentioned or included in the plan
- Low Quality: The plan mentions the item but no detail is given
- Medium Quality: The plan addresses the item to some extent. An item scored "Medium Quality" is a middle-of-the-road score for an item
- High Quality: The plan does a good, solid job in addressing the item which is generally adequate or close to ideal
- No cancer care plan available

[1] Each Australian state also has its own cancer control plan in which more detail is available than in the national plan
[2] Malaysia has an NCCP but does not make it public
[3] Although Myanmar has told the WHO that it has an NCCP, no details are available to the public and it may not even exist
[4] Vietnam has an NCCP but has made only a very small number of details public. Moreover, what is known of the 2007 National Target Program on Cancer Control is not entirely consistent with the National Health Plan 2012-2015

Sources: EIU analysis; national cancer control plans

2 Cancer by country: One enemy, many approaches

Australia

Figure 7 Cancer snapshot: Australia

Key data			
Population: 23.1m (2013, World Bank)			
GDP per capita (PPP): US$46,433 (2014, IMF)			
Total age-standardised cancer incidence per 100,000 (excluding non-melanoma skin cancer; 2012, Globocan)			
Male	374	Female	279
Total age-standardised cancer mortality per 100,000 (excluding non-melanoma skin cancer; 2012, Globocan)			
Male	115	Female	80
Three most common cancers with age-standardised incidence per 100,000 (2012, Globocan)			
Male		Female	
Prostate	115	Breast	86
Colorectum	46	Colorectum	32
Skin melanoma	41	Skin melanoma	30
Top three risks with estimated age-standardised cancer mortality (per 100,000 arising from given risk) (2010, Global Disease Burden Visualisations data)			
Male		Female	
Tobacco smoking	41	Tobacco smoking	15
Dietary risks	18	Physical inactivity	9
High body mass indes	9	Dietary risks	9

Qualitative assessment of cancer control

Cancer is a substantial public health problem in Australia, responsible for nearly three in 10 of all deaths in the country annually. According to Globocan 2012 data, the country has the second highest overall male age-standardised incidence of cancer in the world and the third highest combined male and female incidence. Nor is crude incidence, at least, likely to drop. Professor Jim Bishop, executive director of the Victorian Comprehensive Cancer Centre and previously chief medical officer for the Australian Government, says: "We expect to see a 30% increase in the numbers of patients with cancer in the next 10 years compared to the last 10 years."

The problem is nothing new and, for more than 25 years, the Australian healthcare system has responded robustly to the cancer challenge, backed by broad-based political support. The number and variety of actors involved is too complex to describe in more than cursory detail. Starting at the national or commonwealth level, the Department of Health has ranked cancer as a national priority area since 1996. Rather than creating a single, overarching document to describe its strategy, it has developed a portfolio of coordinated policies in the fields of research, prevention, detection, treatment and patient support (which includes palliative care).

In 2006, an Act of Parliament also created a national government agency, Cancer Australia, which works in collaboration with the health ministry. Among other roles, Cancer Australia provides national leadership on cancer, in particular around inter-governmental collaborative initiatives; guides scientific research and gives evidence-based policy advice; and assists the commonwealth government in implementing policy. Meanwhile, a variety of other relevant national initiatives exist outside of Australia's specific cancer control policies but interact with them, notably the National Tobacco Strategy and the National Palliative Care Strategy.

Australia's constitution, however, splits healthcare between the commonwealth and the states, with the latter having control over public hospitals. As a result, states are also substantially involved in cancer control and all have formal plans of their own. Victoria and New South Wales have shown particular leadership in this area; the former even has its own cancer research agency. State cancer control plans inevitably have a large treatment element, but also typically take a holistic approach that includes elements of prevention and early detection.

On the surface, the specific roles of the various actors can seem confusing. Patient education initiatives might come from anywhere. Tobacco taxes were largely state-based until the Supreme Court ruled in 1997 that only the national government could impose them. Widespread HPV vaccination from 2007—Australia was the first country to introduce this—has been a national initiative. Similarly, decades-old breast and cervical screening programmes, along with colorectal screening which has been rolled out since 2006, are national government efforts. Hospital treatment, though, is at the state level while primary care is a commonwealth jurisdiction. Meanwhile, palliative care is under a national framework but might involve state or national government funding of community initiatives.

Underneath, however, the actors engage in a substantial degree of coordination. Moreover, points out Professor Bishop, although the multiplicity of actors can bring weaknesses, it also has strengths. "If it wants to," he says, "a state can act more quickly than waiting for a national government and end up demonstrating an action that can be taken nationally. Or you can have a national action that can be introduced more vigorously in one place. I'm not sure you

would invent this system if you started from scratch, but it has become very responsive." As a result, most anti-cancer ideas common in the rest of the world are implemented at some level in Australia.

However constructed, the system has been remarkably successful. Unlike incidence rates, Australia's male and female cancer mortality levels are close to the global mean. The country has some of the highest survival rates in the world, even among developed countries.[10] Dr Sankaranarayanan goes as far as to say, "Australia has probably the most effective, well-planned, monitored and evaluated cancer control plan in the world."

Rather than administrative coherence, the effectiveness of Australian cancer control comes from a variety of long-standing attributes which pervade the entire structure.

The first is a holistic approach. Cancer control arrived on the national agenda in 1987 as part of the *Health for All Australians* report of that year for the national government. Already the key recommendations in that document included screening for breast and cervical cancer, tobacco control, and education about excessive sun exposure. A multi-pronged approach has been firmly entrenched ever since.[11]

A study of Australian cancer deaths between 1987 and 2007 shows the value of attacking the problem from all sides. The three cancers which saw the biggest improvement in mortality rates in that period did so for markedly different reasons: the ongoing reduction in smoking rates since the 1970s—Australia has been an international leader in tobacco control—has helped reduce lung cancer; better treatment increased survival for colorectal cancer in that period; and screening and better treatment have had the same effect for breast cancer.[12]

The second key attribute of Australian cancer control has been a tradition of seeking and adopting evidence-based approaches. Says Professor Bishop, "Our programmes are not based on guessing. Where we are convinced that evidence is there that something is effective, we try to fund a programme." Dr Sankaranarayanan also says that the country's efforts have "substantial academic and sociological inputs".

Third, as Dr Trimble puts it, "In Australia, civil society has made it clear that cancer is a problem and they want to work with the government to tackle it." Here, as on the government side, there are multiple actors. Every Australian state has its own "Cancer Council", a member-based NGO for those interested in cancer and cancer policy. These have also established a federated Cancer Council Australia to represent their views at the national level. In addition, some 30 cancer "consumer organisations"—for those directly affected by their own or a family member's cancer—exist and are represented at the national level by the NGO Cancer Voices.

Cancer control policy has, since at least the 1990s, been shaped by extensive input from such organisations and expert committees consulting with them.[13] More recently, in 2011 Cancer Australia published a National Framework for Consumer Involvement in Cancer Control which aims to strengthen consumer participation in all aspects of cancer control, including policy.

A final aspect of cancer control in Australia that sets it apart from other countries in this study is the level of resources available. As Professor Bishop puts it, "We benefit in that we can afford Pap tests, HPV vaccination, and have enough oncologists and radiation machines." But, he adds, "Many things don't need much money." He points in particular to taxes on tobacco, which raise money, but he could also be talking about a holistic, evidence-based approach that involves stakeholders. All of these are widely affordable and can greatly strengthen cancer control.

Of course, no system is perfect. Palliative care, for example, says Professor Bishop, "Has a

[10] Claudia Allemani et al., "Global Surveillance of Cancer Survival 1995–2009: Analysis of Individual Data for 25,676,887 Patients from 279 Population-based Registries in 67 Countries (CONCORD-2)," *The Lancet*, 2014.

[11] Cleola Anderiesz, "Cancer Control Policy in Australia," *Australia and New Zealand Health Policy*, 2006.

[12] Cancer Council NSW, *The State of Cancer Control in Australia 1987-2007: Changes in Cancer Incidence and Mortality*, 2013.

[13] Cleola Anderiesz, "Cancer Control Policy in Australia," *Australia and New Zealand Health Policy*, 2006.

good infrastructure, but we have some way to go to make it work optimally for every patient". Another growing priority has been addressing the poor cancer outcomes of Aboriginal and Torres Strait Islander peoples compared to the population as a whole, a need which is finding increasing attention in cancer control policies.[14]

Finally, Australia's complex cancer control ecosystem provides an ongoing requirement for ever better coordination around the patient in the provision of care. In recent years, commonwealth and state governments have been working together on a variety of projects to create effective care pathways and improve support for patients and their families. Similarly, the commonwealth government is using its health and hospitals fund to support two large integrated cancer centres—which combine research and cancer care—as well as regional cancer centres to promote access and best practice around the country.

Cancer will remain an important public health challenge, but the attitudes and approaches which underlie cancer control in the country should stand Australians in good stead.

[14] Cancer Australia, *Report to the Nation: Cancer in Aboriginal and Torres Strait Islander Peoples of Australia* 2013, 2013; Cancer Australia, *Reconciliation Action Plan for the Years* 2015 - 2018, 2015; Sandra Thompson et al., "Making Progress: the Role of Cancer Councils in Australia in Indigenous Cancer Control," *BMC Public Health*, 2014.

China

Figure 8 Cancer snapshot: China

Key data			
Population: 1,357.4m (2013, World Bank)			
GDP per capita (PPP): US$12,880 (2014, IMF)			
Total age-standardised cancer incidence per 100,000 (excluding non-melanoma skin cancer; 2012, Globocan)			
Male	211	Female	140
Total age-standardised cancer mortality per 100,000 (excluding non-melanoma skin cancer; 2012, Globocan)			
Male	165	Female	83
Three most common cancers with age-standardised incidence per 100,000 (2012, Globocan)			
Male		Female	
Lung	53	Breast	22
Liver	34	Lung	20
Stomach	33	Stomach	13
Top three risks with estimated age-standardised cancer mortality (per 100,000 arising from given risk) (2010, Global Disease Burden Visualisations data)			
Male		Female	
Dietary risks	37	Dietary risks	15
Tobacco smoking	25	Tobacco smoking	9
Ambient particulate matter pollution	14	Ambient particulate matter pollution	6

Qualitative assessment of cancer control

China has a huge cancer problem. The country's registry figures indicate that in 2010—the latest available data—three million new cases arose and two million people died from cancer.[15] According to WHO estimates, which differ in detail but not substance, in 2012 the country saw 27% of the world's cancer mortality but had just 20% of its population.

In recent decades, incidence and mortality have grown markedly, with ageing, as well as the lifestyle change, urbanisation and serious environmental pollution that have accompanied Chinese economic development, playing important roles. Equally striking is

[15] Wanqing Chen et al, "Annual Report on Status of Cancer in China, 2010," *Chinese Journal of Cancer Research*, 2014.

[16] Lihua Liu, "The Global Significance of China's Cancer Burden and Control Effort," *Annals of Translational Medicine*, 2014.

that, although the country has undergone an epidemiological transition—seeing a decline in communicable diseases and rise in NCDs—it has not experienced a similar shift in the type of cancers that are common. Those sites for the disease typically associated with low-income states—liver, oesophagus, stomach—continue to see high incidence and mortality even as those more associated with wealth—breast, lung, colon—are now seeing elevated figures as well. As such, in 2010 China experienced both 51% of global deaths from oesophageal cancer and 35% of those from lung cancer.[16]

China is a relative latecomer to cancer control. Its first NCCP was the National Plan for Tumour Prevention and Control 1986-2000. This took a comprehensive approach, including nutrition education, screening, early detection and treatment, but focussed these on projects for specific cancers in high-risk areas. The plan showed that a holistic strategy could work, for example reducing oesophageal cancer mortality over a five-year period in Linxian, a rural county of Henan province.[17] A further NCCP, covering 2004-2010 was designed to scale up the lessons of the earlier plan and covered the whole range of cancer control. A lack of funding in the early years, however, restricted implementation to a limited amount of public education and scattered screening trials.[18]

Things began to change around 2008, however, at roughly the same time as the country's huge healthcare reform began. The most dramatic shift has been the rapid expansion of population-based cancer registries. Substantial government investment allowed the number of registries to rise from 43 in 2008 to 308 in 2014, now covering 22% of the population, says Dr Wanqing Chen, director of China's National Central Cancer Registries (NCCR) and deputy director of its National Office for Cancer Prevention and Control (NOCPC). Just as important, earlier this year the government required hospitals to report all cancer cases, rather than leaving the practice voluntary. Teething problems exist: some registries have low-quality data (the NCCR excluded the results from about one-third of the registries in its latest cancer estimates); too many are in urban areas; ethnic groups are not differentiated in the results; and mortality figures from rural areas currently appear to be too high given other available data.[19] Nevertheless, the ongoing investment which the government is putting into expansion and improvement of the network is likely to address many of the bugs. Dr Chen expects that "in a few years, registries will cover the whole population of China".

Accurate data is essential for making effective policy, and China's rapid expansion of its registry network, in the words of a Chinese medical journal, "demonstrat[es] the commitment to cancer control by the Chinese government"[20]. Slow progress in other aspects of cancer control, however, shows how far the country still has to go.

Prevention requires work on a variety of levels. Dr Chen notes that although ongoing education efforts by health authorities are improving public knowledge of cancer risks, the NOCPC's own studies have found low understanding of risk factors such as, for example, water pollution. Similarly, an independent academic study of women in eastern China found that over 80% had a poor knowledge of breast cancer.[21] Attitudes towards health—in particular fatalism about cancer and a belief that thinking negative thoughts produces poor health outcomes—impede primary and secondary prevention.[22]

Population-wide prevention also presents challenges. Although China was one of the earliest signatories of the Framework Convention on Tobacco Control, its implementation is weak, with one study putting it in the bottom 20% of countries globally—an issue complicated by having the world's largest tobacco industry which provides the government with over 7% of its revenue.[23] On the other hand, efforts to reduce pollution, in particular of waterways, seem to be bearing some fruit.[24]

[17] Ping Zhao et al., "Cancer Trends in China," *Japanese Journal of Clinical Oncology*, 2010.

[18] WHO, "China Overview: National Cancer Control Plan." [2006], http://www.who.int/cancer/modules/China.pdf

[19] Miao He and Qing Zhang, "There Still a Long Way to Go for Cancer Registration in China," *Annals of Translational Medicine*, 2014; Malcolm Moore, "Cancer Control Programs in East Asia: Evidence From the International Literature," *Journal of Preventative Medicine and Public Health*, 2014.

[20] Lihua Liu, "The Global Significance of China's Cancer Burden and Control Effort," [Editorial], *Annals of Translational Medicine*, 2014.

[21] Li-Yuan Liu et al., "Breast Cancer Awareness Among Women in Eastern China: a Cross-sectional Study," *BMC Public Health*, 2014.

[22] Paul Goss et al., "Challenges to Effective Cancer Control in China, India, and Russia," *The Lancet Oncology*, 2014.

[23] Teh-Wei Hu et al., "WHO Framework Convention on Tobacco Control in China: Barriers, Challenges and Recommendations," *Global Health Promotion*, 2013; Gong-Huan Yang et al., "Findings from 2010 Global Adult Tobacco Survey: Implementation of MPOWER Policy in China," *Biomedical and Environmental Sciences*, 2010.

Screening and early detection also need attention. Trial programmes for breast and cervical cancer screening began in 2006 and have since slowly expanded, but national plans do not exist. The goal of a 2008-2011 health ministry programme was to screen 11m women aged 35 to 59 for cervical cancer and 1.2m for breast cancer, when the number of Chinese females of this age is 142m. As a recent analysis noted, "At the current rate of expansion, it would take another additional [*sic*] 40 years to scan every woman within this age group once." Demonstration projects of screening for other cancers dating back more than a decade have shown it to be cost-effective among high-risk populations, but this activity remains at a tiny scale compared to the need.

Fragmented organisation of the health system makes more progress difficult. Dr Chen points out that existing nationally-funded screening programmes are often run by different government departments, although he expects to see efforts integrated soon. A longer-term problem is a lack of skills, especially in rural areas. "In the countryside," says Dr Chen, "local doctors have little experience about early diagnosis of cancer." Nor is change likely in the near future: a recent survey of medical interns found that prevention and diagnosis were still poorly taught.

Access to treatment is a further weak area. In another example of official fragmentation, China's drug regulators are not as focussed on cancer as other health authorities. New treatments can take years longer to gain approval in the country than elsewhere. More striking, the HPV vaccine still has not been approved, even though the National Plan for NCD Prevention and Treatment 2012-2015 called for its use.

However, gaining such approval is irrelevant for many patients because the selection of medication in China often depends on what individuals can afford rather than clinical effectiveness. Moreover, only 24 cancer medications, including just one opioid analgesic, are on the government's National Essential Medicine List which imposes controlled pricing.

Medical care itself is also difficult to access. "The major problem," says Dr Chen, "is that big cities have very good medical resources but rural areas do not. People don't want to be treated in local hospitals." This leads to patients swamping the facilities of China's 30 specialist cancer hospitals. At the same time, although most of the country has some medical insurance, co-payments can put the annual out-of-pocket cost of cancer care well over US$10,000, beyond the capacity of most Chinese.[30] Palliative care, meanwhile, has not moved beyond its infancy in the country.[31]

Policy makers understand that they have a problem. "Cancer is a major public health issue," says Dr Chen, and "the government is paying serious attention." It is also sending signals that change is imminent. Dr Chen reports that the government's 2014 budget for cancer screening was about US$37m and a huge increase over the year before. Just as important, cancer will be receiving a greater official focus. After the 2004-2010 NCCP expired, from 2012 to 2015 the disease was covered as part of the country's broader plan for NCDs. For 2015 to 2020, the intention is for the country again to have a specific cancer control plan.

Although still an unreleased draft, Dr Chen reports that its main points will likely include better prevention, improved coordination of cancer control efforts, more rapid expansion of screening and early detection, and substantial investment in research—including finally the opening of a National Cancer Centre, approved in 2009 but not yet established.

The government appears to be trying to make up for lost time. Its efforts since 2008 have resulted in important progress in some areas, but the task ahead remains huge.

[24] Paul Goss et al., "Challenges to Effective Cancer Control in China, India, and Russia," *The Lancet Oncology*, 2014.

[25] Le-Ni Kang and Ryou-Lin Qiao, "Cancer Screening and Prevention In China," *Cancer Control*, 2014.

[26] Malcolm Moore, "Cancer Control Programs in East Asia: Evidence from theInternational Literature," *Journal of Preventative Medicine and Public Health*, 2014; "China launches five-year cancer screening program," English.news.cn (Xinhua), 3 August 2012.

[27] Lei Deng et al., "Insufficient Screening Knowledge in Chinese Interns: a Survey in Ten Leading Medical Schools," *Asian Pacific Journal of Cancer Prevention*, 2011.

[28] Paul Goss et al., "Challenges to Effective Cancer Control in China, India, and Russia," *The Lancet Oncology*, 2014.

[29] Paul Goss et al., "Challenges to Effective Cancer Control in China, India, and Russia," *The Lancet Oncology*, 2014.

[30] Paul Goss et al., "Challenges to Effective Cancer Control in China, India, and Russia," *The Lancet Oncology*, 2014.

[31] Esther Schmidlin, "Looking East: China's Oncologists Engage in Palliative Care Education," *European Association for Palliative Care Blog*, 21 June 2013

India

Figure 9 Cancer snapshot: India

Key data			
Population: 1,252.1m (2013, World Bank)			
GDP per capita (PPP): US$5,855 (2014, IMF)			
Total age-standardised cancer incidence per 100,000 (excluding non-melanoma skin cancer; 2012, Globocan)			
Male	92	Female	97
Total age-standardised cancer mortality per 100,000 (excluding non-melanoma skin cancer; 2012, Globocan)			
Male	70	Female	60
Three most common cancers with age-standardised incidence per 100,000 (2012, Globocan)			
Male		Female	
Lung	11	Breast	26
Lip, oral cavity	10	Cervix	22
Stomach	9	Colorectum	5
Top three risks with estimated age-standardised cancer mortality (per 100,000 arising from given risk) (2010, Global Disease Burden Visualisations data)			
Male		Female	
Dietary risks	21	Dietary risks	9
Tobacco smoking	17	Physical inactivity	4
Alcohol use	6	Tobacco smoking	3

Qualitative assessment of cancer control

Those living in India are, compared with much of the world, unlikely to develop cancer. Its age-adjusted incidence is roughly half the global average and, except for a handful of more common cancers, most are so infrequent that in developed countries they would be classified as orphan diseases.[32]

The problem is that those unlucky enough to get cancer are much more likely to die from it than in many other countries. The differences with the developed world are stark. Australian men, for example, are more than four times more likely to develop some form of cancer in a given year than Indian men; women are a bit under three times more likely. On the other hand, Australian male cancer mortality is just 1.6 times that of India and female mortality just 1.3 times. Moreover, deaths from cancer in India are hitting the population younger than in developed countries. According to Globocan 2012 data, 73% of cancer mortality in developed countries occurs in people aged 65 years or older; in India, 64% takes place before that age.

Comparison with less developed countries can be equally unflattering. India's two most common cancer sites—the breast and the cervix—can have very low mortality when the disease is caught early. According to India's registries, the five-year survival rate for breast cancer is 60% and for cervical cancer 46%. In Jakarta, Indonesia, the equivalent figures are 78% and 65% and in China 81% and 60%.[33]

Unfortunately for India, cancer looks set to exact a bigger toll. Globocan estimates that between 2012 and 2035 incidence will grow by 71%, this when the overall population, according to UN data, will increase by only about one-quarter. Cancer outcomes will need to improve.

If one looks at formal policy, India's poor cancer outcomes are surprising. The country has a long history of ostensible cancer control, which the government is not shy about promoting.[34] India has one of the oldest NCCPs in the world, dating back to 1975. Its NCCP has also long had a multi-faceted approach. Since a revision in 1985, the official focus points have included prevention (particularly on reducing tobacco use), early detection of breast and cervical cancer, and equitable distribution of treatment facilities. In 1990, palliative care was added.[35] In 2008, the government folded the NCCP into the broader National Programme for the Prevention and Control of Cancer, Diabetes, Cardiovascular Disease and Stroke, though the priorities did not change.

However, despite decades of making plans, little effort has been made to put them into practice. The government's own draft National Health Policy 2015, which uses the word cancer only a handful of times—always in examples and never to addresses the disease directly—acknowledges that "National Health Programmes for non-communicable diseases are very limited in coverage and scope," and that "despite a policy intent in the form of a national programme on NCDs, the efforts against the growing burden of non-communicable diseases are nascent or initial steps, with considerable distance to traverse before they become universal in outreach".

The best element of cancer control overall in India is its registry system, started in 1981. The individual institutions are certainly of high quality. Dr Malcolm Moore, editor of the *Asian Pacific Journal of Cancer Prevention*, believes that the country has a very good cancer registration programme with many registries having high-quality population-based data. Dr Sankaranarayanan agrees, saying that India's registries provide "good quality sentinel" information. That said, the system covers only 7% of the population, and this is largely urban and skewed toward the south of the country. Given how the cancer picture varies across the country, wider coverage may be necessary.[36]

[32] Mohandas K Mallath et al., "The Growing Burden of Cancer in India: Epidemiology and Social Context," *The Lancet*, 2014.

[33] Claudia Allemani et al., "Global Surveillance of Cancer Survival 1995–2009: Analysis of Individual Data for 25,676,887 Patients from 279 Population-based Registries in 67 Countries (CONCORD-2)," *The Lancet*, 2015.

[34] SP Agarwal ed., *Fifty Years of Cancer Control in India*, Ministry of Health, 2002.

[35] V Shanta et al. "Cancer Prevention and Control in India: A Perspective from the Cancer Institute (WIA)," *Cancer Control*, 2013.

[36] Mohandas K Mallath et al., "The Growing Burden of Cancer in India: Epidemiology and Social Context," *The Lancet*, 2014; Rajesh Dikshit et al., "Cancer Mortality in India: a Nationally Representative Survey," *The Lancet*, 2012.

Looking beyond registration, the cancer control picture on the ground is bleak. On prevention, although India has substantial tobacco control laws, they have gaps: while most advertising is formally banned, point-of-sale marketing is not. Worse still, the rules are often weakly enforced.[37] Whatever the reason, tobacco consumption remains common, with 48% of men and—unusually high for Asia—20% of women using it in some form, according to WHO figures. Tobacco is responsible for 40% of male cancer deaths and 18% of female ones.[38] Unlike many countries, though, a majority chew rather than smoke, explaining the slightly higher both-sex incidence of oral cancer compared to lung cancer. Meanwhile, another important facet of prevention, testing of the HPV vaccine, was suspended for a number of years as anti-vaccine campaigners used safety concerns to undermine support for the measure. The national government began technical evaluation of the vaccine again in early 2015.

Secondary prevention is largely opportunistic, with no national programme in place for any cancer, even though screening for breast, cervical and—for high risk groups—oral cancers has been shown to be cost-effective in India. Healthcare in India is delivered by state governments, but Tamil Nadu and Sikkim are the only ones with widespread breast or cervical cancer screening. The results are predictable: stage data on cancer diagnosis is spotty in India, but what exists indicates that at least half of those presenting with breast cancer, and 75% to 80% of those with some other cancers, do so at an advanced stage.[39]

Treatment facilities are also weak. In practice, the government's main focus in implementing the NCCP since 2005 has been creating and supporting regional cancer centres and hospital-based cancer care. There are currently 27 Regional Cancer Care Centres spread throughout the country and some care at the district hospital level. Some are excellent, but there are wide variations in quality.[40] Worse still, as CS Pramesh, head of thoracic surgery at Tata Memorial Hospital and one of the lead authors of a recent *Lancet* study on cancer in the country told the press, "Most district hospitals and even regional cancer centres do not have the facilities needed to provide quality cancer care to the people who need them."[41]

Different numbers tell the same story. The country has a severe shortage of oncologists, with one for every 16,000 cancer patients.[42] It also has only 41% of the radiotherapy machines it needs.[43] Moreover, almost no provision exists in the countryside, where most of the population lives. In fact, although registries indicate that incidence rates are about twice as high in urban areas, mortality is roughly the same there as in rural areas, presumably because of poorer care in the latter.[44] Finally, a disproportionate number of facilities are in the south, including most of those with a high reputation. This leads to extensive travel from the north by cancer patients to further fill overburdened facilities. Symptomatic of the quality of care are the delays: for example, two months often pass between first consultations and diagnoses of breast cancer.[45]

Efforts to improve are taking shape. Over 50 regional and district cancer centres have formed a National Cancer Grid to exchange expertise and develop standardised best practice across the country.[46] The government has also committed to supporting, in cooperation with willing state governments, the creation of 70 further tertiary centres in existing medical facilities such as hospitals. Given progress to date, however, the speed of change is likely to be slow.

Making matters worse, what care does exist is beyond the reach of many Indians. Out-of-pocket payments account for more than 70% of healthcare spending in the country and cancer is an expensive disease to treat. Although hard data is difficult to obtain, one 2006 study found that the average weekly direct cancer-related cost to a patient during radiation therapy was 60%

[37] The International Tobacco Control Policy Evaluation Project, "TCP India Project Report: Findings from the Wave 1 Survey (2010-2011)," 2013; Sonali Jhanjee, "Tobacco Control in India—Where Are We Now?" *Delhi Psychiatry Journal*, 2011.

[38] Rajesh Dikshit et al., "Cancer Mortality in India: a Nationally Representative Survey," *The Lancet*, 2012.

[39] Paul Goss et al., "Challenges to Effective Cancer Control in China, India, and Russia," *The Lancet*, 2014.

[40] CS Pramesh et al., "The National Cancer Grid of India," *Indian Journal of Medical and Paediatric Oncology*, 2014.

[41] "1 million New Cancer Cases Being Diagnosed in India Each Year: Study," *The Times of India*, 12 April 2014.

[42] Paul Goss et al., "Challenges to Effective Cancer Control in China, India, and Russia," *The Lancet*, 2014.

[43] Ajeet Gandhi and Goura Rath, "National Cancer Control and Registration Program in India," *Indian Journal of Medical and Paediatric Oncology*, 2014.

[44] Rajesh Dikshit et al., "Cancer Mortality in India: a Nationally Representative Survey," *The Lancet*, 2012.

[45] Paul Goss et al., "Challenges to Effective Cancer Control in China, India, and Russia," *The Lancet*, 2014.

of that person's income.[47] The expense can be catastrophic for many families, but especially for those with lower incomes or living in rural areas and therefore needing to travel for care. When these factors accumulate, the results are striking: in rural areas in the worse-off Indian states, 10% of households enter, or go further into, poverty because of cancer every year.[48]

As for palliative care, it is largely non-existent. Although estimates vary, 95% or more of Indians needing such care are unable to access it.[49] The reasons, as one assessment puts it, "are too many and not only include factors like population density, poverty, geographical diversity, restrictive policies regarding opioid prescription, workforce development at base level, but also limited national palliative care policy and lack of institutional interest in palliative care."[50]

There is, however, one bright spot in this field. The state of Kerala, with only 3% of the population, has a large majority of the palliative care facilities in the country. Indeed, the so-called Kerala Model—which combines state provision of medical care with NGO and community-based psychological, social and spiritual support—has become a widely-used case study for how to provide palliative care in a low- or middle-income country.

Cancer care overall in India, then, remains weak. Fixing it, though, is not simply a question of implementing a cancer-specific plan. In many countries, notes Professor Aranda, "cancer care is part of a broader development agenda. You can't address it outside." This is particularly the case in India. Even something as relatively low-cost as screening, explains Dr Sankaranarayanan, "Depends on a critical mass of health services: personnel, infrastructure, equipment, diagnostics, ability to investigate screen-positive people, ability to treat."

India's public healthcare system, however, remains poorly resourced—the national and state governments in aggregate spend only 1.5% of GDP on it—and largely focussed on communicable disease and maternal health. Although private healthcare of high quality exists, the majority of Indians are too poor to afford this. Public investment in healthcare as a whole will need to be part of the response to the challenge of cancer.[51]

Another development need, improved education, may be as important as general healthcare. Cancer mortality is twice as high among the least well educated as the best educated.[52] Wealth and schooling overlap to some extent, but lack of awareness of the risks around cancer, and a sense of fatalism about it, are important barriers to seeking diagnosis and treatment—ones which education can, though does not always, help to break down.[53]

Finally, delivering more investment in education, general healthcare, cancer care, or even addressing the tobacco lobby and anti-HPV campaigners all require political will. The problem is that, on the one hand, says Dr Sankaranarayanan, the political awareness of cancer in governments is extremely limited and there is no political will to commit resources. On the other, Indians seem content with that approach. For example, he adds, "no political party in India says it will introduce mass screening for cervix or breast cancer because popular demand is not there." As long as even talking about a diagnosis is frequently taboo, pressure for change from the electorate will be low.

Turning cancer control into reality in India will involve education, the expansion of healthcare infrastructure and other elements of general development as much as policies which say the right things.

[46] CS Pramesh et al., "The National Cancer Grid of India," *Indian Journal of Medical and Paediatric Oncology*, 2014.

[47] Paul Goss et al., "Challenges to Effective Cancer Control in China, India, and Russia," *The Lancet*, 2014.

[48] C S Pramesh et al., "Delivery of Affordable and Equitable Cancer Care in India," *The Lancet*, 2014.

[49] Suresh Kumar, "Models of Delivering Palliative and End-of-life Care in India," *Current Opinion in Supportive and Palliative Care*, 2013; "Palliative Care is in Need of a Lifeline," *The Times of India*, 3 March 2014.

[50] Divya Khosla, et al., "Palliative Care in India: Current Progress and Future Needs," *Indian Journal of Palliative Care*, 2012.

[51] For this argument in detail, see Mohandas K Mallath et al., "The Growing Burden of Cancer in India: Epidemiology and Social Context," *The Lancet*, 2014; C S Pramesh et al., "Delivery of Affordable and Equitable Cancer Care in India," *The Lancet*, 2014.

[52] Rajesh Dikshit et al., "Cancer Mortality in India: a Nationally Representative Survey," *The Lancet*, 2012.

[53] Paul Goss et al., "Challenges to Effective Cancer Control in China, India, and Russia," *The Lancet*, 2014.

Indonesia

Figure 10 Cancer snapshot: Indonesia

Key data			
Population: 249.9m (2013, World Bank)			
GDP per capita (PPP): US$10,641 (2014, IMF)			
Total age-standardised cancer incidence per 100,000 (excluding non-melanoma skin cancer; 2012, Globocan)			
Male	136	Female	134
Total age-standardised cancer mortality per 100,000 (excluding non-melanoma skin cancer; 2012, Globocan)			
Male	104	Female	79
Three most common cancers with age-standardised incidence per 100,000 (2012, Globocan)			
Male		Female	
Lung	26	Breast	40
Colorectum	16	Cervix	17
Prostate	15	Colorectum	10
Top three risks with estimated age-standardised cancer mortality (per 100,000 arising from given risk) (2010, Global Disease Burden Visualisations data)			
Male		Female	
Tobacco smoking	33	Tobacco smoking	14
Dietary risks	18	Dietary risks	11
Household air pollution from solid fuels	3	Physical inactivity	7

Qualitative assessment of cancer control

As Dr Sankaranarayanan puts it, "Indonesia is lagging behind in every aspect of cancer control." Data is sketchy: the country has only one local population-based registry—for the area around Jakarta. International studies make estimates based on the situation in other countries. Ignorance is widespread: the leading barrier to screening for breast cancer—the country's most common form of the disease—is a basic lack of understanding of the risks.[54] Screening is rare: 3% of the adult population receive colorectal cancer screens—one of the lowest rates in Asia[55]—and, according to recent Ministry of Health figures, just 2.4% of the target population of women aged 30-59 were screened for breast cancer. Not surprisingly, the ministry also says that about 70% of patients first present with cancer at an advanced stage.

Access to treatment is particularly poor in rural areas. But with fewer than 1,000 oncology specialists for a population of 250m in 2012, the problem is evident in urban areas too.[56] As for palliative care, in the experience of James Cleary, associate professor of medicine at the University of Wisconsin who specialises in this field, "in Indonesia, it has just not been considered

[54] Young-Mi Kim et al., "Influencing Women's Actions on Cervical Cancer Screening and Treatment in Karawang District, Indonesia," *Asian Pacific Journal of Cancer Prevention*, 2012; Aulia Iskandarsyah et al., "Psychosocial and Cultural Reasons for Delay in Seeking Help and Non-adherence to Treatment in Indonesian Women with Breast Cancer: A Qualitative Study," *Journal of Health Psychology*, 2013.

[55] Malcolm Moore, "Cancer Control Programs in East Asia: Evidence from theInternational Literature," *Journal of Preventative Medicine & Public Health*, 2014.

[56] "Indonesian Oncologists Serious about Cancer," *The Jakarta Post*, 19 October 2012.

important"—a conclusion that is hard to gainsay when the country has only 11 oncology specialists in this field.

At first glance, the situation appears little different from other low-income countries where policy is either weak or well-meaning but poorly enforced. A closer look, however, shows a country that is starting to wrestle seriously with the challenge of cancer.

Cancer control in some form dates back to the 1920s in Indonesia but efforts have tended to be intermittent, despite the work of important institutions such as the Indonesian Cancer Foundation (ICF)—an influential NGO created in 1977—and the Dharmais Hospital National Cancer Centre founded in 1993.[57] More consistent momentum, though, has been building since 2005, when the Ministry of Health established a directorate of NCD control which in turn created a sub-directorate of cancer control. Within a year, the latter had adopted a multi-pronged strategy to address cancer, including education, prevention and treatment.

How Indonesian cancer policy evolved thereafter makes more sense in the context of locally produced data about the cancer burden than of international estimates. The former paints an unexpected picture. Given that two-thirds of Indonesian adult males smoke,[58] the highest rate in the world, one would expect lung cancer to be a huge problem. Instead, the most common cancer in Jakarta hospitals in 2005—hospital registries contained the best data then available—was that of the nasopharynx, a very rare condition worldwide but one best explained by high rates of the Epstein-Barr virus in the country.[59]

A more detailed look at Jakarta population-registry data published in 2012 gives a slightly different picture for 2007. Though nasopharynx cancer remained high by global standards, this study showed lung cancer as the most common form of the disease among men. Its reported incidence, though, was shockingly low and almost certainly inaccurate—only six per 100,000 or about one-quarter of the Globocan 2012 estimate.[60] Instead of lung cancer, data available in both 2006 and the later analysis indicated that breast and cervical cancer were by far the dominant challenge in this field for the country, far exceeding any cancer that affects both sexes or just men.

This, along with the strength of the local tobacco industry, helps explain the relative absence of tobacco control from Indonesian cancer control efforts. The country is one of the few in the region not to have signed the WHO Framework Convention on Tobacco Control and historically even its relatively weak anti-smoking regulations have been poorly enforced. Legislation passed in 2012 toughening laws on packaging and smoke-free areas may help but activists and even the then minister of health—whose predecessor had recently died of lung cancer—had wanted to go further.[61]

Instead, although the NCCP that was adopted in 2006 included anti-tobacco education, the strategy's most visible elements were general education on cancer risks, creation of a population registry around Jakarta, and pilot screening projects for early detection of cervical and breast cancer.[62] The last of these was an obvious area on which to focus, not only because of the high incidence but because the country had some of the lowest survival rates for breast cancer in Asia.[63] The approach to screening was inevitably low-cost, relying on clinical breast examination instead of mammograms and on visual inspection with acetic acid (VIA) instead of Pap smears, but both have proven to be reasonably accurate in practice. Moreover, the programmes deployed these techniques creatively: VIA testing, because it gives an immediate result, was made part of a one-stop combination which offered on-the-spot cryotherapy treatment where appropriate.[64]

An important element of this work has been cooperation between the government,

[57] Prijo Sidipratomo, "Current Management in Malignant Diseases: Indonesia," *Japan Medical Association Journal*, 2012.

[58] WHO, *Global Adult Tobacco Survey: Indonesia Report 2011*, 2012.

[59] Tjandra Yoga Aditama [Ministry of Health], "Framework of National Cancer Control Program in Indonesia," *Indonesian Journal of Cancer*, 2008; Marlinda Adham, "The Role of EBV Markers in Diagnosis, Treatment and Monitoring of Nasopharyngeal Carcinoma in Jakarta, Indonesia," doctoral thesis, Free University of Amsterdam, 2014.

[60] Mugi Wahidin, "Population-Based Cancer Registration in Indonesia," *Asian Pacific Journal of Cancer Prevention*," 2012.

[61] "Health Minister Says Tobacco Rules Not Enough," *The Jakarta Globe*, 14 January 2013.

[62] Rainy Umbas, "Recent Activities about Cancer Control Programme in Indonesia and Relations with Asia," presentation to the 20th Asia Pacific Cancer Conference, Japan, 2009.

[63] Keun-Young Yoo, "Cancer Prevention in the Asia Pacific Region," *Asian Pacific Journal of Cancer Prevention*, 2010.

professional organisations and civil society. Indeed, multi-stakeholder engagement around cancer sets Indonesia apart in the region. The ICF has long run a limited amount of screening, hospice care and cancer-related social services directly to patients. More importantly, it is socially well-connected within Indonesia—the wives of provincial governors and district heads are frequently presidents of local chapters—and, with other NGOs, has been able "to influence government to make cancer a priority at national and local levels," says Nila Moeloek, Indonesia's minister of health since October 2014. She should know: before entering cabinet she was co-chair of the ICF.

The cervical screening programme involves cooperation between the government, ICF and another NGO, the Family Welfare Movement (PKK). Unlike the ICF, the latter is a widespread, grassroots women's movement that engages in extensive volunteer work in a broad range of development areas, including healthcare. Analyses have found that such cooperation between different actors contributed significantly to some pilot projects' ability to reach previously untested women, although where local coordination was poor the impact of PKK workers was much reduced.[65]

Although constituting an important beginning, most of the cancer control efforts after 2006—covered by the original NCCP and a follow-on one for 2010-2014—involved small-scale trials and pilot projects, none of which were able to affect the broader picture greatly. Dr Moeloek acknowledges that the country needs to improve on screening rates, as well as find resources to increase cancer treatment provision and access, especially for rural populations. The best way to improve the situation, she believes, would be the "initiation and strategic implementation of a massive campaign of cancer prevention and control," involving intensified cooperation between national and local governments and NGOs.

Beginning under her predecessor and even more so since Dr Moeloek became health minister, the government is moving in this direction. In October 2014, the health ministry established a formal National Cancer Prevention Committee (KPKN) with tasks that include creating a prevention strategy and overseeing the NCCP. In February, the minister, the chair of the KPKN, as well as the heads of various professional organisations and civil society groups publicly signed a National Commitment Against Cancer—a promise to work together on making cancer a healthcare priority, on education and detection, and on implementing a coherent policy that covers all areas of cancer control. In late April, this moved beyond declarations of intent, when the country's First Lady announced the expansion of cervical screening to cover the entire population in a programme that would draw heavily on the support and efforts of the ICF and PKK.

The NCCP has also been significantly updated. Covering the years 2015 to 2019, the latest version aims to: increase education; build on breast and cervical screening—with a goal of reaching half of the target population in five years; investigate the cost effectiveness of HPV vaccination; expand treatment and palliative care facilities; and establish more population-based registries so that they collectively cover 10% of Indonesians. It is also finding ways to use limited resources effectively. Breast and cervical cancer screening, for example, will be integrated with existing maternal health and STD services.

Rather than being a cancer control backwater, Indonesia will see in the next few years how far coherent, multi-stakeholder policy and efforts can grow into something which provides the country with the ability to address the disease effectively.

[64] D Kardinah et al., "Short Report: Limited Effectiveness of Screening Mammography in addition to Clinical Breast Examination by Trained Nurse Midwives in Rural Jakarta, Indonesia," *International Journal of Cancer*, 2014; J Vet et al., "Single-visit approach of cervical cancer screening: See and Treat in Indonesia," *British Journal of Cancer*, 2012.

[65] J Vet et al., "Single-visit Approach of Cervical Cancer Screening: See and Treat in Indonesia," *British Journal of Cancer*, 2012; Young-Mi Kim, et al., "Evaluation of a 5-year Cervical Cancer Prevention Project in Indonesia: Opportunities, Issues, and Challenges," *Journal of Obstetrics and Gynaecology Research*, 2013.

Malaysia

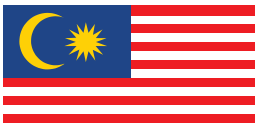


Figure 11 Cancer snapshot: Malaysia

Key data			
Population: 29.7m (2013, World Bank)			
GDP per capita (PPP): US$24,654 (2014, IMF)			
Total age-standardised cancer incidence per 100,000 (excluding non-melanoma skin cancer; 2012, Globocan)			
Male	145	Female	143
Total age-standardised cancer mortality per 100,000 (excluding non-melanoma skin cancer; 2012, Globocan)			
Male	92	Female	80
Three most common cancers with age-standardised incidence per 100,000 (2012, Globocan)			
Male		Female	
Lung	27	Breast	39
Colorectum	21	Colorectum	16
Prostate	11	Cervix	16
Top three risks with estimated age-standardised cancer mortality (per 100,000 arising from given risk) (2010, Global Disease Burden Visualisations data)			
Male		Female	
Tobacco smoking	38	Tobacco smoking	11
Dietary risks	15	Dietary risks	8
Occupational risks	4	Physical inactivity	7

Qualitative assessment of cancer control

The cancer control situation in Malaysia is among the most difficult to assess of all the countries in this study. Government policy is an enigma. And looking at specific areas yields an equally puzzling picture. In some ways the country is a leader in the region, while in others its efforts are poor and have weakened in recent years.

It was not always so. At the start of this century, Malaysia had a comprehensive NCCP which included important elements of prevention, early diagnosis, treatment, palliative care and rehabilitation, and the drafting of which involved notable stakeholder cooperation.[66] In the middle of the last decade, Dr Saunthari Somasundaram, president of the National Cancer Society of Malaysia, recalls that work to create an updated programme—to cover the years 2008 to 2013—involved substantial stakeholder input as well. This plan, however, was never ratified and never made public. "Instead, Malaysia's cancer control policy is an internal document being used by the Ministry of Health but not visible to other stakeholders," she adds.

The absence of a public NCCP is particularly strange because the Malaysian government did issue a laudably detailed, integrated action plan on NCDs as a whole to cover the years 2010-

[66] Gerard Lim, "Overview of Cancer in Malaysia," *Japanese Journal of Clinical Oncology*, 2002.

2014.[67] This, though, focussed almost entirely on heart disease, diabetes and obesity, with only a very small element of cancer control. Moreover, in 2012 the government requested the WHO and the International Atomic Energy Agency's Programme of Action for Cancer Therapy to conduct a confidential review of Malaysia's cancer control needs—a sign of official interest in the field if nothing else.

Dr Somasundaram believes that the most likely explanation for the government's silence is the desire to avoid political pressure. After preparing the current NCCP, she says, "[The government] realised how overwhelming the issue is, the extent of the resources that need to be put into it, and that the government was unable to commit them." The authorities certainly are sensitive about data. Dr Moore notes that cancer registration and many other aspects of cancer control have been moved into the Ministry of Health rather than being handled by independent registries or institutes. "Of course people in the ministry say that everything is progressing very well, but sometimes they are wary about giving information," he notes.

At the same time, Malaysia has actually seen a substantial decrease in the quality of cancer information. Dr Somasundaram notes that, in the early years of the last decade, the country had a good national registry which issued regular reports between 2003 and 2007. Then, funding cuts led to its elimination in favour of state-based registries. Reporting to these registries, however, is not compulsory and the many private healthcare providers in the country do not always do so. The resultant data is not only less accurate than that previously available, but figures from the state-based registries also suggest a decline in cancer incidence, contrary to all other available evidence, says Dr Somasundaram. Mortality figures are insufficiently robust to help.

Although unwilling to invest in cancer data, the government is putting substantial money into treatment and improved access. The flagship of this effort has been the opening in September 2013 of a state-of-the-art, US$200m treatment facility, the National Cancer Institute. The health ministry, however, realises that it needs to do more in terms of provision. It says, for example, that the country has only 80 oncologists but requires about 300 and it has begun working with local universities to train more.

While access is improving, Dr Somasundaram notes: "Current [health ministry] efforts are primarily focused on treatment. When you look at cancer control as a whole, we haven't touched on many of the components." The nature of the cancer challenge in the country, however, is such that a holistic approach is essential to progress. Prevention, education and early detection efforts in particular are necessary to address the country's high rates of cancer morality, made much worse by the large number of patients who currently present with typically untreatable, late-stage cancers.[68]

Simple lack of knowledge is an issue: for example, although colorectal cancer is one of the leading forms of the disease, most Malaysians cannot identify a single risk factor for it.[69] Problematic cultural attitudes, though, constitute a bigger difficulty. Continuing belief in the efficacy of traditional healers, for example, leads to patients presenting at late stages of the disease, or not at all for breast cancer.[70] Dr Somasundaram notes, "cancer is equated with death, so fear of conventional treatment is high and many who are diagnosed don't want to access treatment facilities." More generally, she explains, "cancer still has a major stigma in Malaysia and there is a very fatalistic attitude toward it. Education is senseless when people don't believe you can do anything about it." She adds that the health ministry, NGOs and business have engaged in frequent information campaigns, but the uptake is still quite slow in terms of belief.

In other areas of prevention, the country's record is mixed. Occupational risks are a leading cause

[67] Malaysian Ministry of Health, "National Strategic Plan for Non-Communicable Disease," 2010.

[68] A Sachithanandan and B Badmanaban, "Screening for Lung Cancer in Malaysia: Are We There Yet?" *Medical Journal of Malaysia*, 2012; Nor Idawaty Ibrahim et al., "Who are the Breast Cancer Survivors in Malaysia?" *Asian Pacific Journal of Cancer Prevention*, 2012; Lim Kean Ghee, "A Review of Colorectal Cancer Research in Malaysia," *Medical Journal of Malaysia*, 2014.

[69] Lim Kean Ghee, "A Review of Colorectal Cancer Research in Malaysia," *Medical Journal of Malaysia*, 2014.

[70] B Norsa'adah et al., "Understanding Barriers to Malaysian Women with Breast Cancer Seeking Help," *Asian Pacific Journal of Cancer Prevention*, 2012.

of male cancers and better regulation—including banning rather than restricting asbestos, which is still in use on private construction sites[71]—would help. On the other hand, the general NCD programme has positive prevention elements and anti-tobacco regulations have recently been strengthened. Most striking, starting in 2010 the health ministry began HPV vaccination of 13-year-old girls, making it one of only two countries in this study with a large-scale programme. Although participation was not mandatory, in 2012 over 95% of the target population was inoculated.[72]

Early detection, however, is weak. Screening for breast and cervical cancer is only opportunistic and, says Dr Somasundaram, has not even really begun for other cancers. Colorectal screening rates, for example, are among the lowest in Asia[73]. Poor screening partly reflects a lack of resources devoted to this area, but public attitudes also complicate matters. Programmes providing free mammograms in convenient locations have received an uptake of under 2% of the target population in recent years, Dr Somasundaram reports.

On the other hand, Malaysia has some of the best palliative care in the region, partly a legacy of the country's more comprehensive approach to cancer control in earlier years. For over a decade the government has funded certain aspects of palliative care through the universal healthcare system. Palliative medicine is also a recognised medical sub-speciality in Malaysia.

Dr Ednin Hamzah, CEO of Hospis Malaysia, notes that weaknesses remain: palliative care is available only for adults; data on morphine use in the country compared to need suggests that access is limited; and community palliative care, run entirely by NGOs, is highly variable and requires standardisation. Nevertheless, he adds, next to much of the rest of the world "Malaysia looks good" in this field.

Overall, then, cancer control in Malaysia is a mixture of the very good, such as HPV vaccination and palliative care, and the extremely problematic—including poor screening, deteriorating data and an NCCP hidden from public sight. Dr Somasundaram says that many of those she interacts with in the ministry of health are passionate about what they are doing, but often their hands are tied because they are unable to get the resources. Where they can, they have created sometimes region-leading results. Further progress, however, will likely require a more holistic—and transparent—approach.

[71] Irina Zen et al., "Use of Asbestos Building Materials in Malaysia: Legislative Measures, the Management, and Recommendations for a Ban on Use," *International Journal of Occupational and Environmental Health*, 2013.

[72] Saidatul Buang and Rahani Jahis [Ministry of Health], "Access to New Vaccination: The HPV Vaccination in Malaysia," presentation to Health Policy Decision Makers Forum Asia-Pacific, 2012.

[73] Malcolm Moore, "Cancer Control Programs in East Asia: Evidence from the International Literature," *Journal of Preventative Medicine & Public Health*, 2014.

Myanmar

Figure 12 Cancer snapshot: Myanmar

Key data			
Population: 53.3m (2013, World Bank)			
GDP per capita (PPP): US$4,706 (2014, IMF)			
Total age-standardised cancer incidence per 100,000 (excluding non-melanoma skin cancer; 2012, Globocan)			
Male	149	Female	135
Total age-standardised cancer mortality per 100,000 (excluding non-melanoma skin cancer; 2012, Globocan)			
Male	129	Female	100
Three most common cancers with age-standardised incidence per 100,000 (2012, Globocan)			
Male		Female	
Lung	25	Breast	22
Liver	16	Cervix	21
Stomach	15	Lung	16
Top three risks with estimated age-standardised cancer mortality (per 100,000 arising from given risk) (2010, Global Disease Burden Visualisations data)			
Male		Female	
Tobacco smoking	34	Tobacco smoking	13
Dietary risks	15	Dietary risks	10
Household air pollution from solid fuels	4	Physical inactivity	6

Qualitative assessment of cancer control

Myanmar has reported to the WHO that it has an NCCP, but evidence for it on the ground is sparse. The current National Health Plan makes general statements about the importance of preventing non-communicable diseases, including cancer, but does little beyond stating the need. As for cancer itself, Ian Olver, director of the Sansom

Institute for Health Research at the University of South Australia, notes that on a recent fact-finding trip to the country to look at treatment facilities, "there wasn't a formal set of policies or plan they could give"—an experience similar to that of other international expert visitors.[74] The best indication of a lack of any comprehensive strategy is that a high-level, multi-stakeholder meeting in January 2015 organised by the government on cervical cancer encouraged the creation of a national control plan for that specific cancer, but made no mention of any existing programme that addressed all forms of the disease.[75]

The absence of a substantial NCCP is consistent with the general cancer control situation. Data quality is low. Although two hospital-based registries exist—in Yangon and Mandalay—nothing in the country currently meets international standards for inclusion in the IARC's Cancer in Five Continents studies. Myanmar's figures for incidence and prevention in international databases typically rely on estimates based on data from nearby countries.

Prevention is also underdeveloped. While anti-tobacco controls have existed for some time—such as the designation of smoke-free public places and advertising bans—campaigners complain that they are not enforced.[76] Moreover, the government has only begun to look at restricting betel quid chewing, even though a 2009 ministry of health report found that, while smoking rates had been declining in previous years, the use of smokeless tobacco had been increasing.[77]

As for medical care, few people with cancer are being diagnosed or treated: a recent study of Asian cancer services put the country among those where fewer than one-quarter of people with the disease are receiving adequate care. Similarly, a more detailed look at childhood cancer in Myanmar found that around 90% of those affected were either not being diagnosed or treated.[78] Those diagnosed also tend to face long waits for the limited facilities. Finally, the country has only two palliative care hospices, which collectively have places for 100 people.[79]

Amidst the undeniable challenges surrounding cancer in Myanmar, however, important positive signs exist. Dr Brenda Kostelecky, a health science policy analyst at the US National Cancer Institute Centre for Global Health, explains: "A lot of people in Myanmar are incredibly committed to developing a cancer policy, though they face many challenges." Professor Olver agrees: "The government recognises that it should do something about this. It shows a desire to improve." A clear sign is the nature of the cervical cancer conference noted above: it was a multi-stakeholder forum—an innovation in cancer control for the country—that brought together government officials, medical professionals, research institutes, and international and local NGOs to look at a range of integrated strategies to address cervical cancer.

The authorities have also been willing to invest in cancer care as part of a wider updating of the country's health service. Professor Olver calls it "impressive" how the government is trying hard to catch up in the area of treatment. It rapidly replaced all the country's old radiotherapy cobalt machines with linear accelerators and now several key hospitals have a good range of basic chemotherapy drugs available free where there were none as late as 2012. In this area, Professor Olver believes, the country is "a lot further ahead" than many at a similar level of economic development and catching up quickly to some middle-income countries.

This effort, though, also shows the problems of lacking a more comprehensive strategy. Professor Olver explains that, while the government has put money into advanced equipment, few of the staff are trained in how to use the new machines. "In Australia the shift [from cobalt machines to linear accelerators] took 10 years. Here it is

[74] See, for example, "Palliative Care in Myanmar: Hospices and Help from Visiting Specialists," *Mizzima: News from Myanmar*, 20 February 2015.

[75] Myanmar Research International, *Cervical Cancer Prevention and Control Programs in Myanmar: National Coordination Meeting, 15th to 16th January 2015, Nay Pyi Taw*, report, 2015.

[76] "Campaign Pushes for Stricter Tobacco Controls in Burma," *The Irrawaddy*, 21 December 2013.

[77] "Lawmakers Push for Betel Nut Awareness Campaign," The Irrawaddy, 24 February 2015.; Myanmar Ministry of Health, *Brief Profile on Tobacco Control in Myanmar*, 2009.

[78] Rengaswamy Sankaranarayanan, "Managing the Changing Burden of Cancer in Asia," *BMC Medicine*, 2014; Jay Halbert and Aye Aye Khaing, "Overview of Paediatric Oncology and Haematology in Myanmar," *South Asian Journal of Cancer*, 2014.

[79] "Palliative Care in Myanmar: Hospices and Help from Visiting Specialists," *Mizzima: News from Myanmar*, 20 February 2015.

happening in two or three," he says. This is part of a more general human resource challenge. Although both Professor Olver and Dr Kostelecky report that cancer clinicians in Myanmar are dedicated, they are few in number and also know that they have skills which require updating after the long years of international isolation which the country experienced.

Even a broader focus on clinical care cannot do everything, especially in a country where patients with cancer tend to present late. Professor Olver believes that a significant issue for cancer control in Myanmar is that things like registries, national screening programmes, prevention and other parts of the equation are not on the agenda. "They will need eventually to have some national policies around these," he says.

Myanmar is not a wealthy country and it needs to balance carefully where it directs its own resources, and those from donors. In doing so, it will to have to find ways to bring together its recent willingness to spend on upgraded equipment and to interact with stakeholders. An improved NCCP could be central to that effort.

South Korea

Figure 13 Cancer snapshot: South Korea			
Key data			
Population: 50.2m (2013, World Bank)			
GDP per capita (PPP): US$35,277 (2014, IMF)			
Total age-standardised cancer incidence per 100,000 (excluding non-melanoma skin cancer; 2012, Globocan)			
Male	340	Female	294
Total age-standardised cancer mortality per 100,000 (excluding non-melanoma skin cancer; 2012, Globocan)			
Male	146	Female	65
Three most common cancers with age-standardised incidence per 100,000 (2012, Globocan)			
Male		Female	
Stomach	62	Thyroid	89
Colorectum	59	Breast	52
Lung	46	Colorectum	33
Top three risks with estimated age-standardised cancer mortality (per 100,000 arising from given risk) (2010, Global Disease Burden Visualisations data)			
Male		Female	
Tobacco smoking	53	Dietary risks	10
Dietary risks	31	Tobacco smoking	8
Alcohol use	14	Physical inactivity	5

Qualitative assessment of cancer control

Cancer has been the biggest killer in South Korea since 1983 and, according to Globocan data, the country had the eighth-highest combined male and female incidence of the disease in the world in 2012.

Although the country is now economically developed and completed its epidemiological transition some time ago, its cancer burden contains reminders of how relatively recent these changes are. South Korea combines the world's highest incidence of stomach cancer, a largely developing-world form of the disease, with among the most elevated levels of colorectal cancer, an affliction more common in wealthier countries.

Indeed, lifestyle changes brought on by economic growth has affected rates of both, notes Professor Keun-Young Yoo, honorary president of Korea's National Cancer Centre. The widespread appearance of refrigerators in Korean households after 1970 put more fruit and vegetables into the national diet, leading to a steep drop in levels of stomach cancer. On the other hand, colorectal is sometimes referred to as an 'imported cancer' by Koreans due to its link to westernised diets.

National cancer control policies in Korea date back to 1996. In the ensuing years, the country has built a system that "is very strong", says Dr Moore, in large part because the government has been persuaded to get behind establishing a comprehensive programme.

This support found concrete expression in the 2003 National Cancer Act. It gave added regulatory support to existing efforts like the National Cancer Screening Programme (NCSP) which began in 1999. More important, the act established a legal structure for cancer control. This included the creation of: important institutions, such as a National Cancer Commission to oversee the NCCP and regional cancer centres—now numbering a dozen—to improve access; a requirement that central and regional governments produce regular cancer plans; and a formal process to set the budget for cancer control.

Professor Yoo believes that the value of this law is the key lesson of Korean cancer control: "Every country developing an NCCP should first get a cancer control act. Having a legal basis is the most important thing." The system that has emerged as a result revolves around a National Cancer Centre which, in line with the detailed national NCCP, develops and oversees programmes in all areas of cancer control.

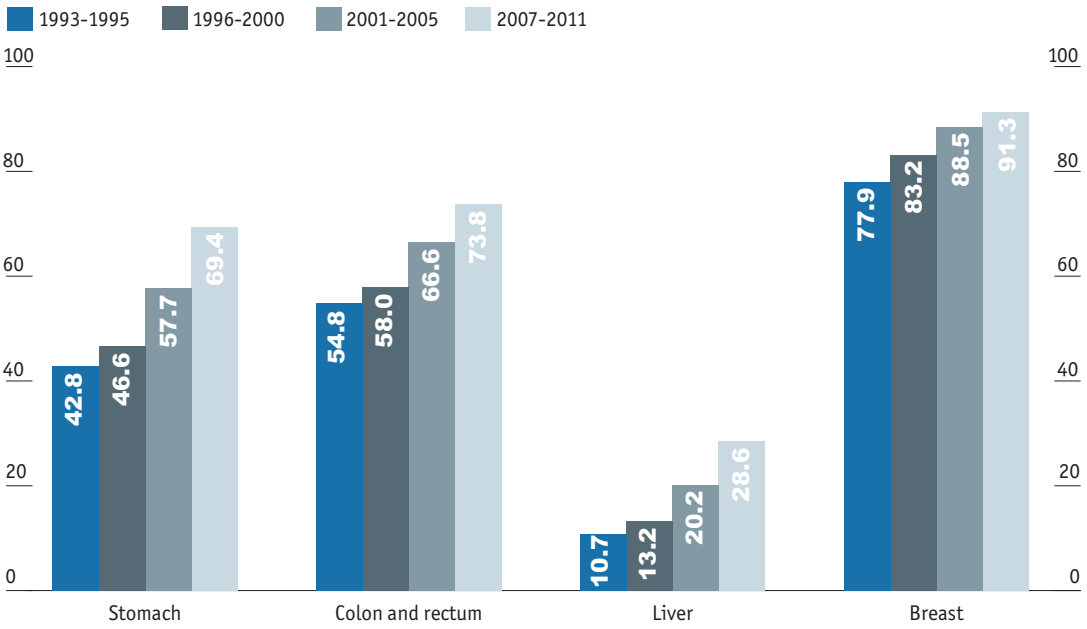
A key element of this system is data gathering and analysis. A crucial contribution of the National Cancer Act was therefore to create a national registry by incorporating and expanding various local population-based registries and a hospital-based system which dated back to 1980. More important, it exempted relevant cancer data from provisions of the privacy law which had effectively blocked registry activity for several years.[80] As a result, the country now has one of the most highly-regarded registries in the region.

Figure 14

Survival of the fittest

Comparison of five-year relative survival rates in South Korea (1993-2011)

(%)



Source: NCC, *Cancer Facts 2014*

[80] Yoon-Ok Ahn, "Cancer Registration in Korea: The Present and Furtherance," *Journal of Preventative Medicine and Public Health*, 2007.

[81] Minjee Lee et al., "Socioeconomic Disparity in Cervical Cancer Screening among Korean Women: 1998–2010," *BMC Public Health*, 2013; Yoon Young Lee et al., "Barriers to Cancer Screening among Medical Aid Program Recipients in the Republic of Korea: A Qualitative Study," *Asian Pacific Journal of Cancer Prevention*, 2014.

[82] Mina Suh et al., "Trends in Cancer Screening Rates among Korean Men and Women: Results from the Korean National Cancer Screening Survey, 2004-2012," *Cancer Research and Treatment*, 2013.

The defining characteristic of Korean cancer control, however, is its emphasis on screening. In line with international practice, the NCSP has national cervical, breast and colorectal cancer screening, along with two sites less commonly investigated in other countries: stomach cancer generally and liver cancer for high-risk individuals. Although medical services in Korea frequently have a co-payment, these interventions are free for those with lower incomes, while studies indicate that Koreans of a higher socio-economic status are even more likely than others to be screened.[81] Local NCSP officials are also given incentives to increase the number of people screened in their areas, says Professor Yoo.

As a result, high numbers in the target groups have been screened: over three-quarters at least once for breast, cervical and stomach cancer and around two-thirds for colorectal and liver cancer.[82] One effect, says Professor Yoo, has been a "rapid prolongation of survival". The numbers bear him out (figure 14). Some of the improvement no doubt arises from better medical techniques and care, but the data also indicates that screening is likely to have made an important contribution.[83]

Korea's experience with screening, however, also has a dark side. Diagnosis of thyroid cancer increased by 1,500% between 1993 and 2011.[84] By 2012, the country had the highest reported age-standardised incidence in the world for both men and women, with the latter roughly 15 times the global average according to Globocan. On the other hand, mortality rates from the disease have long remained largely flat, suggesting that it was getting no more common.

The most likely explanation is that testing for the condition is now widespread. Although not part of the NCSP, private medical providers who conduct government screening often offer thyroid checks as an additional extra for a small fee: Professor Yoo points out that the high rate of the disease among women likely reflects that this occurs in conjunction with breast and cervical screening. The additional imaging is turning up a very large number of tiny tumours, but almost all are treated. In fact about one-quarter of those removed by surgery are of such a small size that guidelines instead recommend no action. Much of this is unnecessary: about one-third of all human beings have tumours of this size, the vast majority harmless. More than one in ten of those whose tumours are removed in Korea, however, have some negative side effects.[85]

The over-diagnosis and aggressive treatment of thyroid cancer in Korea is consistent with a healthcare system which mixes high levels of technology and access to services with relatively little oversight of quality. Although a general issue,[86] signs are that it applies to cancer diagnosis and treatment as well. On the one hand, according to the OECD, equipment abounds: in 2011, the country had 21.3 MRI scanners and 35.9 CT scanners per million population compared to an OECD average of 13.3 and 23.6 respectively.[87] On the other hand, says Professor Yoo, "we have to deal with the quality assurance of cancer screening units. I'm not sure it is satisfactory now."

Similarly, cancer care in well-equipped facilities is widely available. The OECD reports, though, that little data is gathered on treatment variation and quality across the country and some of what does exist—such as the high number of mastectomies by international standards—suggest more attention is needed.[88]

Treatment costs can also be an issue. Professor Yoo reports that, in particular, many anti-cancer drugs are not covered by Korea's National Health Insurance (NHI) scheme, although at least cancer treatment has a lower co-payment (5%) than most other care on the NHI. The net result, according to one study that looked at two tertiary facilities, is that patients pay out of pocket over US$900 per hospital admission for cancer, a substantial sum for many.[89]

[83] Kyu-Won Jung et al., "Survival of Korean Adult Cancer Patients by Stage at Diagnosis, 2006-2010: National Cancer Registry Study," *Cancer Research and Treatment*, 2013.

[84] Hyeong Sik Ahn et al., "Korea's Thyroid-Cancer "Epidemic"—Screening and Overdiagnosis," *New England Journal of Medicine*, 2014.

[85] Hyeong Sik Ahn et al., "Korea's Thyroid-Cancer "Epidemic"—Screening and Overdiagnosis," *New England Journal of Medicine*, 2014.

[86] Randall Jones, *Health-care Reform in Korea*, OECD Economics Department Working Papers No. 797, 2010.

[87] OECD, *Cancer Care: Assuring Quality to Improve Survival*, 2013.

[88] OECD, *Cancer Care: Assuring Quality to Improve Survival*, 2013.

[89] Chang Hoon You et al., "Time Trend of Out-of-pocket Expenditure among Cancer Inpatients: Evidence from Korean Tertiary Hospitals," *Asian Pacific Journal of Cancer Prevention*, 2013.

[90] WHO, *Global Status Report on Alcohol and Health 2014*, 2014; OECD, "Obesity and the Economics of Prevention: Fit not Fat - Korea Key Facts," 2015.

[91] A Shin et al., "Population Attributable Fraction of Infection-related Cancers in Korea," *Annals of Oncology*, 2011.

[92] Jae Hoon Lim, "Liver Flukes: the Malady Neglected," *Korean Journal of Radiology*, 2011.

Despite these issues, early detection and treatment of cancer in South Korea are strong. Where Professor Yoo sees the need for improvement is in prevention: "We have a strategy on tobacco, alcohol and body weight but they are not so effective." High smoking rates among males (over 40%), for example, have remained stagnant for about a decade, although a doubling of tobacco tax in January may improve matters. Meanwhile, Koreans drink the most alcohol per capita of any country in Asia and levels of obesity, though low, are growing.[90]

In addition to lifestyle-related efforts, prevention of infection-induced cancer also merits more attention. Unlike many other developed countries where these cancers can be rare, in Korea they result in about one-quarter of cancer mortality,[91] another sign of a recent epidemiological transition. While the country has had HBV vaccination since 1985, no national HPV vaccine programme exists. Moreover, even with HBV vaccination, current levels of hepatitis B and C, as well as the highest levels of liver fluke outside of Thailand,[92] mix with the country's alcohol habit to drive liver cancer. Incidence among males is more than double the global average and among women is just under twice the mean. Liver fluke also helps account for the world's highest male incidence of gallbladder cancer. Interventions exist, however, to cure or limit the effect of all these cancer-causing conditions.

The biggest infection-related cancer problem is widespread helicobacter pylori infection, a common cause of stomach cancer.[93] These bacteria are present in 54% of Korean adults.[94] Health authorities have become more aggressive in treatment of the infection. Given the country's high rate of stomach cancer, they may wish to keep a close eye on ongoing experiments in helicobacter pylori eradication across entire populations, especially as the Korean National Cancer Centre's own study is not due to be complete until 2026.[95]

One reason why improved prevention is so important says Professor Yoo is that, in addition to reducing incidence, it could help alleviate a problem arising from some of Korean cancer control's successes. Better screening and treatment have left the country with an increasing number of cancer survivors who require ongoing support and care. The figure more than doubled between 2003 and 2011 to reach 684,000 or about 1.4% of the country's population.[96] At that rate of increase, the number is likely to now be at least one in every 60 Koreans. Korean support care, however, is weak, frequently resulting in low quality of life.[97]

Similarly, for those patients where treatment has failed, palliative care is problematic. Professor Yoo notes that the government is reluctant to loosen laws on opioid use. And, he adds: "Hospice services are very small. Even in private hospitals there is a very, very limited number of beds in palliative care units." Government data back this up: in 2013, only 12% of those dying of cancer used hospice or palliative care services.[98] Academic studies have also found that doctors typically refer patients to such care only very late, and that its quality is highly variable.[99]

Korean cancer control has had very positive results from sticking to sensible goals. To improve further, it now needs to widen its horizons.

[93] A Shin et al., "Population Attributable Fraction of Infection-related Cancers in Korea," *Annals of Oncology*, 2011.

[94] Seon Hee Lim et al., "Prevalence and Risk Factors of Helicobacter Pylori Infection in Korea: Nationwide Multicenter Study over 13 Years," *BMC Gastroenterology*, 2013.

[95] Sun-Young Lee, "Current Progress Toward Eradicating Helicobacter Pylori in East Asian Countries: Differences in the 2013 Revised Guidelines between China, Japan, and South Korea," *World Journal of Gastroenterology*, 2014; IARC, *Helicobacter Pylori Eradication as a Strategy for Preventing Gastric Cancer*, 2014; "Helicobacter Pylori Eradication for Gastric Cancer Prevention in the General Population (HELPER)," 2014, *ClinicalTrials.gov*.

[96] National Cancer Centre, *Cancer Facts & Figures 2014 in the Republic of Korea*, 2014.

[97] Minsoo Jung, "Cancer Control and the Communication Innovation in South Korea: Implications for Cancer Disparities," *Asian Pacific Journal of Cancer Prevention*; Myueng Guen Oh et al., "Health-related Quality of Life Among Cancer Survivors in Korea: The Korea National Health and Nutrition Examination Survey," *Japanese Journal of Clinical Oncology*, 2013.

[98] "South Korea: New Policy for Hospice/palliative Care Payment System Imminent," *eHospice*, 8 December 2014.

[99] Young Ji Baek et al., "Late Referral to Palliative Care Services in Korea," *Journal of Pain and Symptom Management*, 2011; Jin Young Choi et al., "Variations in Process and Outcome in Inpatient Palliative Care Services in Korea," *Supportive Care in Cancer*, 2011.

Taiwan

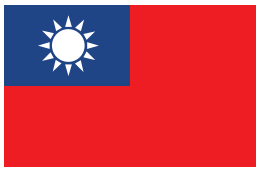


Figure 15 Cancer snapshot: Taiwan

Key data			
Population: 23.3m (2013, Taiwan Ministry of the Interior)			
GDP per capita (PPP): US$45,854 (2014, IMF)			
Total age-standardised cancer incidence per 100,000 (excluding non-melanoma skin cancer; 2012, Globocan)			
Male	339	Female	255
Total age-standardised cancer mortality per 100,000 (excluding non-melanoma skin cancer; 2012, Globocan)			
Male	169	Female	95
Three most common cancers with age-standardised incidence per 100,000 (2012, Globocan)			
Male		Female	
Colorectum	53	Breast	64
Liver	52	Colorectum	36
Lung	44	Lung	25
Top three risks with estimated age-standardised cancer mortality (per 100,000 arising from given risk) (2010, Global Disease Burden Visualisations data)			
Male		Female	
Tobacco smoking	66	Tobacco smoking	20
Dietary risks	28	Dietary risks	10
Physical inactivity	5	Physical inactivity	7

Qualitative assessment of cancer control

Taiwan has a long record of cancer control. It has had a high-quality registry for more than three decades.[100] This wealth of data is put to regular use. Professor Chien-Jen Chen, vice-president of the Academia Sinica, Taiwan's national academy, says: "All of our cancer control programmes are evidence-based." Treatment has also for some time been of high quality[101] and available with only a small co-payment since state reimbursement for cancer care began in 1995. Survival rates mirror those in other developed countries.

On prevention, Taiwan has also been active and achieved some notable successes. Widespread Pap smear screening began in 1997 and since that year mortality from cervical cancer has

[100] Chun-Ju Chiang, "Quality Assessment and Improvement of Nationwide Cancer Registration System in Taiwan: a Review," *Japanese Journal of Clinical Oncology*, 2015.

[101] Chun-Ju Chiang et al., "Cancer Trends in Taiwan," *Japanese Journal of Clinical Oncology*, 2010.

[102] Shih-Yung Su et al., "Evidence for Cervical Cancer Mortality with Screening Program in Taiwan, 1981–2010: Age-period-cohortM," *BMC Public Health*, 2013.

dropped by more than half.[102] More striking, the country is also a frequently-cited case study for the potential value of vaccination in the fight against cancer. With a significant hepatitis B problem—about 15% of adults had the disease in the 1970s—the government began universal infant vaccination in 1984. Prevalence of HBV, and rates of the liver cancer that it can cause, have dropped dramatically among the young as the inoculated cohort has aged. A treatment programme for hepatitis B and hepatitis C that began in 2003 has similarly been accompanied by declining incidence of liver cancer in the older population.[103]

Over the long term, the whole range of Taiwan's cancer control efforts has had a marked impact. Professor Chen notes that between 1979 and the present, total incidence has increased roughly 300% but mortality only by 30%.

Nevertheless, cancer remains Taiwan's leading cause of death by some margin, with an age-standardised mortality rate of more than double that of heart disease. Moreover, the country has over recent decades seen substantial reductions in deaths from other NCDs, but not cancer [figure 16]. This has led to political support for action. Indeed, official determination to reduce the burden of the disease is, says Professor Chen, "the main strength of cancer control" in Taiwan.

This attitude is long-standing: the Legislative Yuan, Taiwan's parliament, passed the Cancer Prevention Act in 2003 to bolster an existing robust law on cancer control. Efforts have, however, accelerated since the coming to office of the current president, Ma Ying-jeou, in 2008 whose election platform included a pledge to reduce cancer mortality. On the other hand, notes Professor Chen, government policy is largely—though not fully—implemented due to budget constraints. Cancer is a priority, but one of many.

The most interesting aspect of recent cancer control efforts is how these have tried to address the problem as early as possible, and shift some of the present emphasis on treatment. The main thrust of the 2010-2013 NCCP was improvement of screening programmes for early detection[104], providing free screening for the four types of cancer where a widespread intervention can be cost-effective: breast, cervix, colon and bowel. Between 2009 and 2012, the annual number of screenings jumped from 3.01m to 4.94m, which generated marked improvements in the number of patients found at early stages.[105]

Although progress is being made, the government believes that the proportion screened for colorectal and breast cancer remains too low (around 30%). A draft new cancer control programme accordingly has goals of increasing that figure to over 60% for both by 2018.[106] Professor Chen agrees that current numbers are too small but warns that an overly general, untargeted approach may be wasteful. Oral screening, for example, has been the least likely in Taiwan to find any cancers. "It is not very effective," he says, because "the goal is to reach the [numerical] target, but the screening is too broad. Dental clinics are paid by the number of patient screens, not by how many cancer cases are detected." As such, high-risk groups who might not visit such facilities do not receive appropriate attention.

Efforts to improve screening also make apparent a barrier to improved cancer control no matter how well supported by the government. Professor Chen explains that one reason for the still-low rates is "inadequate distribution of knowledge and cancer information". This is part of a larger problem. The biggest weakness for cancer control in Taiwan, Professor Chen believes, is that, despite previous education efforts, "public awareness of cancer risk factors is still inadequate," a particular problem among those who are older or of lower socioeconomic status.

Such ignorance can be fatal. Professor Chen explains that some patients when diagnosed still

[103] Mei-Hwei Chang et al., "Decreased Incidence of Hepatocellular Carcinoma in Hepatitis B Vaccinees: A 20-Year Follow-up Study," *Journal of the National Cancer Institute*, 2009; CH Chang et al., "National Antiviral Treatment Program and the Incidence of \ Hepatocellular Carcinoma and Associated Mortality in Taiwan: a Preliminary Report," *Medical Care*, 2013.

[104] Taiwan Ministry of Health and Welfare, "Cancer Prevention and Control," March 2015.

[105] Shu-Ti Chiou, *Development of a National System for Comprehensive Cancer Prevention and Control in Taiwan*, Ministry of Health and Welfare presentation [2014].

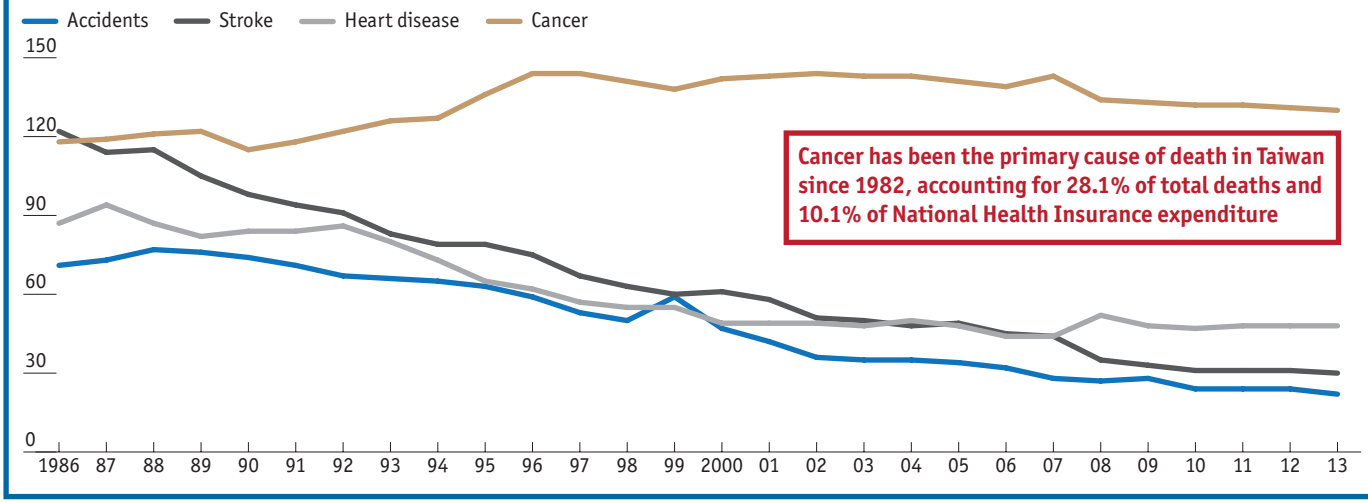
[106] Taiwan Ministry of Health and Welfare, *National Cancer Prevention and Control Program (Third Phase) - Draft*, March 2015.

Figure 16

A not-so-rare death trap

Leading causes of death in Taiwan

Age-standardised mortality rate (per 1,000)



do not want to go for western medical care but will go for Chinese medicine which is less effective. "From a technological point of view, we have the most up-to-date programmes and treatments in our medical centres, but patients themselves may not take advantage of them," he says.

The government also sees the importance of education. Its new, draft cancer control policy, while still aiming to expand screening, has prevention as its main focus.[107] It foresees creation of coherent, all-of-government policies—including appropriate education in schools and the community—around healthy lifestyles, tobacco control and betel-nut chewing. Professor Chen, though, notes that to date such efforts have often been too unfocussed. For example, they have sought to raise awareness of the dangers of betel nut within the population as a whole rather than specifically among blue-collar workers who are the main chewers. Effective prevention should be as evidence-driven as any other part of the system.

The new draft NCCP is also looking to use a type of patient education to help with treatment. Currently 18% of patients do not receive any care within three months of diagnosis. The government plans to cut this in half by 2018 by creating a Patient Navigation Service to help those with the disease to access the range of available providers in order to receive appropriate, customised care.

Finally, while most of the focus of recent years has been on screening and prevention, palliative care has also received some attention. Such care is subsidised by the health system in Taiwan and, notes Professor Chen, with regard to provider knowledge, experience and technology in medical centres, is very good. But, he notes, "accessibility for cancer patients is still inadequate". A little under one-half of those who died of cancer in 2011 in Taiwan had received some hospice or home care in the preceding year. The government hopes to increase this to 60% by 2020, although in the past it has fallen short of its targets in this area.

Overall, Taiwan has a robust cancer control policy which is becoming increasingly comprehensive. Hopefully, this will allow the country to make the same sort of progress against cancer as it has on other NCDs.

[107] Taiwan Ministry of Health and Welfare, *Cancer Prevention and Control*, March 2015.; Taiwan Ministry of Health and Welfare, *National Cancer Prevention and Control Program (Third Phase) - Draft*, March 2015.

Thailand

Figure 17 Cancer snapshot: Thailand

Key data			
Population: 67.0m (2013, World Bank)			
GDP per capita (PPP): US$14,354 (2014, IMF)			
Total age-standardised cancer incidence per 100,000 (excluding non-melanoma skin cancer; 2012, Globocan)			
Male	150	Female	129
Total age-standardised cancer mortality per 100,000 (excluding non-melanoma skin cancer; 2012, Globocan)			
Male	114	Female	77
Three most common cancers with age-standardised incidence per 100,000 (2012, Globocan)			
Male		Female	
Liver	35	Breast	29
Lung	31	Cervix	18
Colorectum	15	Lung	13
Top three risks with estimated age-standardised cancer mortality (per 100,000 arising from given risk) (2010, Global Disease Burden Visualisations data)			
Male		Female	
Tobacco smoking	57	Tobacco smoking	18
Dietary risks	17	Dietary risks	8
Alcohol use	12	Physical inactivity	5

Qualitative assessment of cancer control

Thailand's cancer incidence is roughly similar to that of other low- and middle-income countries in this study. Its five-year prevalence figures, however, are substantially higher, indicating much better outcomes.

This is no accident. As Dr Kostelecky notes, "Thailand is one of the more advanced countries in South-east Asia in terms of cancer control." Dr Moore goes slightly further, offering that, outside of the wealthiest countries, Thailand is one of the leaders in this field in the Asia-Pacific region. Underlying the country's relative effectiveness is strong, long-standing

government support for cancer control: the country's first NCCP dates back to 2000 and arose from a process overseen by the prime minister. Just as important, however, is how health officials use their limited resources to make efforts against cancer most effective.

To begin with, Thailand's approach to cancer control is comprehensive rather than focussed narrowly on treatment. Its latest NCCP, which is detailed, covers prevention, screening, treatment, palliative care, cancer data and capacity-building.[108] Nor is the policy simply a ministry of health initiative. A variety of different departments and agencies, and in some areas non-governmental stakeholders, have roles in implementation. Dr Trimble warns that this can lead to coordination difficulties and turf battles but, he agrees, "it is a good plan".

Thailand excels in particular at data collection, with six provincial, population-based registries included in the latest IARC *Cancer Incidence in Five Continents* study—more than the number in Japan or South Korea.[109] Since the publication of that study, 10 more registries have been set up and the intention is that there should eventually be one to cover the population of every province. More important, this data does not rest idle. Dr Weerawut Imsamran, director of the country's National Cancer Institute (NCI), explains that analysis of information plays a central role in Thai cancer control and intervention planning. This reflects a strong, evidence-based approach overall. Dr Kostelecky notes that the country's NCI "functions a lot differently than many of the others we work with, doing a lot of cost effectiveness research and implementation studies."

Prevention efforts are also widespread. Hepatitis B vaccination is nearly universal and tobacco control legislation is strong. Thailand also is willing to pursue innovative approaches to prevention. Since 2001, the Thai Health Promotion Fund (ThaiHealth), a specialised health promotion agency funded by an alcohol and tobacco surtax, has financially supported disease-prevention efforts by a variety of social actors. More recently, after decades of slow progress using mainly medical approaches, the country has decided to roll out a newly-trialled multi-pronged effort—including medical treatment, community education and improved sanitation—aimed at eliminating the threat of parasitic liver fluke. This parasite is spread by eating raw, affected fish. The disease which the parasite causes is, in turn, behind much of the country's liver cancer, Thailand's most common form of the disease. In pilot projects, the infection rate in fish dropped from up to 70% to 1%, while that among people declined by about two-thirds.[110]

Not all efforts are as effective: smoking rates have stayed stable in recent years, and even risen among the young.[111] Dr Imsamran believes that, although prevention efforts work quite well in Thailand, "we still need to perform more health education in the community". Moreover, the country cannot afford everything. After conducting cost-effectiveness studies, health officials decided that widespread HPV vaccination would be too expensive.

Early detection and screening, already common, are seeing increasing attention from health authorities. The country has for some time provided cervical cancer screening for women aged 30 to 60 in primary care clinics and, says Dr Imsamran, 2009 data indicate that about 70% of women had availed themselves of the service in the previous five years. Now, following a successful pilot study in Lampang Province,[112] the government plans to launch colorectal cancer screening. The latest NCCP also mentions pilot projects to examine screening for breast cancer and, for high-risk groups, oral cancers.

As regards treatment, one advantage that Thai cancer patients have over peers in some other low- and medium-income countries in

[108] Thailand Ministry of Health, National Cancer Control Programmes 2013-2017, 2013.

[109] Malcolm Moore, "Cancer Control Programs in East Asia: Evidence From the International Literature," *Journal of Preventive Medicine & Public Health*, 2014.

[110] Banchob Sripa et al., "Toward Integrated Opisthorchiasis Control in Northeast Thailand: The Lawa Project," *Acta Tropica*, 2014.

[111] Rassamee Sangthong et al., "Current Situation and Future Challenges of Tobacco Control Policy in Thailand," *Tobacco Control*, 2012.

[112] Thiravud Khuhaprema et al., "Organised Colorectal Cancer Screening in Lampang Province, Thailand: Preliminary Results from a Pilot Implementation Programme," *BMJ Open*, 2014.

the region is that Thailand's universal health care system provides free cancer diagnosis and care. Dr Imsamran notes that this has helped to increase the number of patients who present at early stages of the disease. The country also has National Working Groups for all common cancers; these working groups have developed clinical practice and referral guidelines.

On the other hand, treatment in Thailand has some elements in common with its economic peers. High-quality facilities do exist, but these unfortunately are insufficient. "We do not have enough cancer centres for all patients so not all of them can access diagnosis and treatment in time," says Dr Imsamran. "Lack of oncology personnel is our major problem: we need more pathologists, radiotherapists, medical physicists and oncology nurses," he adds. The latest NCCP does call for shorter waiting times, both to see a specialist and between diagnosis and treatment, but the concerns it also expresses over costs suggest that progress may be slow.

Probably the weakest area of cancer control in Thailand is palliative care. "It is still one of our challenges", Dr Imsamran says, "although large urban hospitals provide this service, it is difficult for patients who live in rural areas to access it." Moreover, general practitioners are poorly versed in the specifics of such care.[113] Change, however, appears likely. "Fortunately," adds Dr Imsamran, "the Ministry of Public Health is making this issue a priority."

The NCCP gives detailed goals for the establishment of better palliative care, including a number of measurable benchmarks, such as the use of opioids in late-stage patients and those with cancer who die at home or in a community hospice. Meanwhile, ThaiHealth is supporting a series of projects by the newly formed Thai Palliative Care Society to raise the profile of such care, to better integrate it with the health system, and to provide appropriate training for nurses and doctors. Finally, a number of community hospitals are setting up palliative care units.

Thai cancer control is by no means perfect. For example, despite its high five-year prevalence compared to local peers, by international standards some survival rates remain poor[114]. Nevertheless, the country's experience does show what limited resources can achieve when a country takes a comprehensive approach that uses evidence-based interventions.

[113] Jiratha Budkaew and Bandit Chumworathayi, "Knowledge and Attitudes toward Palliative Terminal Cancer Care among Thai Generalists," *Asian Pacific Journal of Cancer Prevention*, 2013; P Krongyuth et al., "Palliative Care in Thailand," *International Journal of Palliative Nursing*, 2014.

[114] Claudia Allemani et al., "Global Surveillance of Cancer Survival 1995–2009: Analysis of Individual Data for 25,676,887 Patients from 279 Population-based Registries in 67 Countries (CONCORD-2)," *The Lancet*, 2015.

Vietnam

Figure 18 Cancer snapshot: Vietnam

Key data			
Population: 89.7m (2013, World Bank)			
GDP per capita (PPP): US$5,635 (2014, IMF)			
Total age-standardised cancer incidence per 100,000 (excluding non-melanoma skin cancer; 2012, Globocan)			
Male	173	Female	114
Total age-standardised cancer mortality per 100,000 (excluding non-melanoma skin cancer; 2012, Globocan)			
Male	148	Female	76
Three most common cancers with age-standardised incidence per 100,000 (2012, Globocan)			
Male		Female	
Lung	41	Breast	23
Liver	40	Lung	12
Stomach	24	Liver	11
Top three risks with estimated age-standardised cancer mortality (per 100,000 arising from given risk) (2010, Global Disease Burden Visualisations data)			
Male		Female	
Tobacco smoking	68	Tobacco smoking	15
Dietary risks	23	Dietary risks	11
Alcohol use	11	Physical inactivity	4

Qualitative assessment of cancer control

The Vietnamese healthcare system is struggling to cope with a cancer burden that already accounts for 18% of mortality in the country, according to WHO estimates. That figure may even be low: WHO put the annual number of cancer deaths at about 92,000 but recent research in the country suggests it is more likely to be around 100,000.[115]

Similarly, local data does not reflect the relatively stable overall age-standardised rate of incidence for cancer found in the Global Burden of Disease figures. Data supplied by Dr Tran Van Thuan,

[115] "Vietnam Detects 160,000 New Cases of Cancer Each Year," *Vietnam Breaking News*, 17 October 2014.

deputy director of the country's National Cancer Hospital—the largest specialised cancer care provider in the country—indicate that, for the five biggest cancers as a group, the age-standardised rate rose between 2000 and 2010 by 40% for women and 24% for men.

The country does have an NCCP, or more precisely a National Target Program on Cancer Control, which dates back to 2007. It is difficult to assess the content, as the government does not make the plan public. What elements of the plan that are public knowledge, though, suggests that it began with a multi-faceted view of the problem. The original 2008 goals include, among others: better prevention through tobacco control and greater HBV vaccination; reduction of the large number of cancer patients who present at stage three or later from the then figure of 80% to 50% by 2020; and establishment of community-based palliative care.[116]

More recently, however, policy seems to have grown less focussed. In the National Health Plan for 2012 to 2015, the only cancer-related goals are: raising awareness on prevention and early detection; a 5% to 10% increase in the rate of early-stage detection; and reduced mortality for breast, cervix, mouth and colorectal cancer.[117]

The details of Vietnam's NCCP, however, are less significant than in some other countries because, as Dr Thuan notes, "the budget [for implementing the plan] from the government is low and insufficient." As a result, much of it simply remains on paper.

The difficulties begin with problematic data. The country has nine hospital-based registries, six of which date back to 2000, but no population-based registries. Nevertheless, Dr Kostelecky and Dr Thuan believe that they provide reasonable incidence figures. The difficulty, both say, is poor mortality data, in part because so many people die at home, making information collection difficult. The other data-related problem is a lack of government funding and human resource support to analyse what is available for shaping and changing policy, adds Dr Thuan.

Another notable area of weakness is prevention. Vaccination is carried out under the government's NCD strategy and has had some success. Hepatitis B vaccination is now widespread. Tobacco control has historically been weak, with various reforms put in place in and after 2000 having had very little impact.[118] However, this may be remedied following the enactment of the country's first anti-smoking law in 2013. Nevertheless, Dr Thuan estimates that currently "cancer prevention efforts meet only 30% of the need"—an improvement since the start of the NCCP but still low. Pollution and poor diet remain substantial concerns and knowledge about cancer risks is still weak.

Even less progress has taken place on early detection of cancers. Dr Trimble explains: "Vietnam has some pretty good hospitals and well-trained doctors, but is being overwhelmed with late-stage presentations." Roughly 70% of the country's patients are diagnosed at stage three or later.[119] Unfortunately, reports Dr Thuan, "in recent years, screening has not been included in NCCP implementation due to its decreasing budget." As a result, although breast cancer is the most common form of the disease among women and has been increasing in incidence, Dr Thuan says that the number of women aged 40 to 54 who were screened for breast and cervical cancer between 2008 and 2013 was only 120,000, or 1.4% of that part of the population.

Those who do present with cancer face treatment in facilities that are stretched thin: Dr Thaun notes that his hospital is seeing a growth in patients of 20% to 30% annually. Hospitals in general are overcrowded to an extent that reducing that problem is a leading priority of the health minister.[120] Only a limited amount of high-technology equipment is available. As a result, survival rates are lower than in much of the region.

[116] WHO, *Vietnam—Overview: National Strategy for Cancer Control (2010 and 2020)*.

[117] "Gánh nặng ung thư: Thách thức và cơ hội của Việt Nam? [Burden of Cancer: Vietnam's Challenges and Opportunities?], 20 December 2014, VNMedia.

[118] D.T. Tran et al., "Tobacco Control in Vietnam," *Public Health*, 2013.

[119] Bùi Diệu et al., "Gánh Nặng Bệnh Ung Thư Và Chiến Lược Phòng Chống Ung Thư Quốc Gia Đến Năm 2020" [The Heavy Cancer Burden and the National Cancer Prevention Strategy by 2020], Tạp Chí Ung Thư học Việt Nam [Vietnamese Oncology Journal], 2012.

[120] "Strengthening National Cancer Planning Efforts and Building on 20 Years of US-Vietnam Relations," National Cancer Institute blog, 23 January 2015.

Finally, although limited palliative care is available in five Vietnamese hospitals, at the community level—as envisaged in the NCCP—it is largely non-existent, in part because of ongoing (and only slowly relaxing) restrictions on the use of opiates.

Dr Thuan does note that some progress has occurred since 2007. The level of investment in cancer control, especially in the area of treatment, has strengthened the system even if it still falls far short of what is needed.[121] Moreover, he adds, public understanding of cancer risks is improving, if slowly.

These improvements, though, cannot alone address the country's substantial and growing cancer challenge. Dr Thuan believes it is time to have a comprehensive re-evaluation of the cancer control programme in Vietnam, including human resources, facilities, prevention, treatment and palliative care, based on evidence from registry data. Such a reappraisal, he adds, would need to involve investment in the necessary human and technical resources, but it would also require an important change from a government-directed approach to one based on stakeholder input. "Improving partnership for cancer control can be the first step for change in cancer control," he concludes.

[121] See also, Catherine Harper (consultant for the World Health Organization), *Vietnam Noncommunicable Disease Prevention and Control Programme 2002-2010 Implementation Review*, 2011.

3 War on cancer: From common weaknesses to a clear agenda

National cancer burdens and efforts against the disease addressed in this study are as diverse as the 10 nations covered. Nevertheless, several themes reappear, often showing both the promise, and the many weaknesses, of cancer control in the Asia-Pacific.

The most positive is the increasing profile that the disease is receiving across the region. As Dr Trimble says, "government commitment is critical regardless of income level". Several countries in this study with the most effective programmes already have a substantial history of political support for cancer control. Equally heartening are the indications that other countries are coming on board—from an erstwhile cancer activist now health minister signing a National Commitment Against Cancer in Indonesia to governments spending substantial sums in China and even Myanmar. Not all have made this transition, but it appears to be gathering steam.

This is more positive than the mere existence of NCCPs which, although ostensibly universal in the region, are not public in a least three countries. Moreover, a genuine national focus on cancer, and the attendant planning and economic resources it brings, are essential to success against the disease. The poor implementation of Vietnam's NCCP is due in large measure to lack of funding. More striking, India's experience shows that more than four decades of formal NCCPs with relatively strong data gathering, if not accompanied by relevant health system investment, can leave a country ill-prepared to address cancer.

If NCCPs alone are not sufficient for effective cancer control, they are still essential for motivated governments and health systems. If nothing else, they can help avoid problems such as purchasing high-technology equipment without having the personnel trained to use them. More generally, they allow a more comprehensive response which, as Dr Trimble says, "makes clear that the country needs cancer education, prevention, screening, treatment, symptom management, survivorship, health surveillance, etc., not just one piece of the puzzle."

As Thailand's success in particular shows, good plans that are well executed allow even medium-income countries punch above their economic weight in this field. The experience of the countries in this study, however, indicates that—in addition to under-resourcing—quite a few of the pieces of the puzzle are missing often enough to merit highlighting. These include:

A need for more data and evidence-based policy: "High-quality population-based cancer registration data are the basis of any cancer control programme," affirms Dr Moore. Data deficiencies, however, are common in the countries under discussion. According to Globocan in 2012, only four had regional registries covering more than 10% of the population and just two had high-quality mortality data. Many are trying to expand their registries, although Malaysia has allowed its data to deteriorate.

Such information, however, should not be an end in itself, especially for countries with limited resources, warns Professor Aranda. The data need to be put to use to understand national requirements. For example, she notes: "Low-resource countries often start with breast cancer because the West does, but that may not be logical. The question is how to [obtain and use] this data in a sustainable way with the resources available. If a registry isn't helping with system planning, it is creating a whole lot of cost that has no benefit." Indeed, for countries with constrained resources, data for data's sake is wasteful but accurate cost-benefit analysis essential. Those most effective at cancer control in the region already obtain good data and use them to shape strategy. All should move in that direction.

A need for a more holistic approach to cancer care: Cancer is a multi-factorial condition, but too often national strategies against it fail to use all available tools. This deficiency takes a number of forms which vary by country, including:

- *An over-emphasis on treatment compared to prevention and screening in certain countries:* Perhaps ironically, developing countries frequently place greatest emphasis on the most expensive part of cancer control—treatment. In this study, for example, much of Myanmar's and Vietnam's investment has been in this area and, recently, so has Malaysia's. Such facilities are not in themselves a bad thing. As Dr Sankaranarayanan notes, "hospitals, tertiary care and healthcare providers are critical for cancer care."

  But balance is necessary. Without appropriate prevention and screening, these facilities tend to be overwhelmed by late-stage presentations which even the best technology can not treat. Moreover, highly specialised cancer treatment capabilities may not be appropriate for a health system that needs broad-based strengthening, says Professor Aranda: "Real thinking needs to go into having an emphasis on specialist capacity but having clear expectations about what that delivers for the whole population and how you integrate that into general surgery."

  Perhaps the biggest problem with an overemphasis on treatment is that, in the countries with the greatest improvements against cancer, prevention and screening often account for at least as much, if not more, of this success than improved medical technology and treatment intervention, and at a far lower cost.

- *Screening with too little prevention:* Widespread screening, where cost-effective, can rapidly improve survival rates and is central to effective cancer control. As Korea and Taiwan have found, though, like treatment, screening is just one tool among many rather than a complete solution. Both states are now turning to greater prevention to help bring down rapidly rising incidence, as even treatable cancers bring their own challenges to healthcare systems.

  More generally, many countries in this study are missing out on potential easy wins in the area of prevention. Smoking rates among males are too high in most of Asia, and, as Professor Aranda notes, in some less developed states tobacco control would do more than any other single intervention. Nevertheless, anti-tobacco efforts are frequently weak, either in law or in practice. Similarly, HPV vaccines are not in widespread use, even in some countries where affordability is not an issue. Prevention programmes are not always cost-effective, but those that are need to be put in place.

- *A lack of palliative care:* The most common weakness in cancer control in the countries in this study is poor provision of palliative care. As Professor Cleary puts it, outside of Australia, South Korea, Malaysia and Kerala state in India, "it is a struggle to find a

country doing it well." Establishing effective palliative care provision is easier said than done. It may require overcoming cultural obstacles, legal issues in opioid use, and training deficiencies. Nevertheless, notes Professor Cleary, in much of South-east Asia the high number of people who present with cancer at an advanced stage only increases the emphasis which should be placed on this integral element of cancer control.

A need to engage more with those outside the health system: Cancer is a disease that afflicts human beings, not anonymous subjects of medical intervention. Interacting with, and gaining the support of, individuals and whole populations is therefore essential for effective cancer control. In many of the countries examined here, two weaknesses in this area stand out:

- *Lack of popular awareness:* In the majority of the countries covered in this study, issues such as a lack of understanding of the risks of cancer or the potential treatment options available, explain one or more of: the adoption of behaviour with high health risks; the failure to take up screening opportunities; the use of traditional medicines which have little, if any, efficacy against cancer; and late presentation for treatment or not using medical services at all. It is not simply a matter of putting out information. Healthcare systems need to overcome deeply-held assumptions, in particular pervasive cancer fatalism in many cultures. "Creating a positive message is very important," Dr Sankaranarayanan believes. Those who have been cured have to come forward. This is simply not there at the moment.
- *Lack of stakeholder involvement in cancer control:* As Dr Trimble notes, in cancer control the role of civil society is critical. "In the US, we have seen advocates leading the charge for 50 years," he says. Outside of Australia, and to a lesser degree Thailand, however, Dr Sankaranarayanan says, "stakeholders and society play very little role in the planning and organisation of cancer control programmes. [Such engagement] just does not exist in many countries." A strong stakeholder role is essential not only for understanding the needs of patients as individuals, so as to provide better cancer care; it also helps maintain the essential societal support for cancer programmes without which current political attention to the issue might easily fade.

A need to consider appropriate legal foundations: All government activity occurs within a legal context and cancer control is no exception. Two countries in this study, Taiwan and South Korea, have formal cancer control legislation which can bring a range of advantages from providing secure budgets to helping overcome obstacles to data usage. The utility of such an approach will vary depending on the situation and even the legal system: Australia's constitutional division of powers, for example, means that legislation from any single state government could address only part of cancer control. Nevertheless, as health systems seek to provide effective cancer control, governments should consider how formal laws might help.

Cancer is a growing part of the Asia-Pacific region's healthcare burden. Every country studied here is responding in some way and a widespread understanding exists of the need to do more. Success in this struggle, though, will depend on turning NCCPs into vehicles for genuinely integrated, comprehensive strategies that use every evidence-based tool available in the cancer control armoury.

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