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Decision-making for cancer care:
A review of current practice and opportunities for improvement in Latin America

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About this report

Decision-making for cancer care: a review of current practice and opportunities for improvement in Latin America is an independent Economist Intelligence Unit report, sponsored by Varian Medical Systems.

Although Latin America has made important progress in cancer care over the past several years, the region still suffers from insufficient access to prevention and care needed to tackle the problem. Perhaps more urgently, experts suggest that cancer rates are expected to increase significantly in the coming years, and the region is largely unprepared. Stakeholders may suggest that not much can be done without more resources. However, this report seeks to challenge this assumption by illuminating opportunities for more evidence-based and strategic decision-making to optimise existing resources, and limit the impact of misperceptions, influences and short-term thinking across the policy environment.

With this in mind, The Economist Intelligence Unit (EIU) conducted a research programme to raise awareness and stimulate discussion among key stakeholders in the region. This research focuses on the urgent imperative for decision-makers to reassess their approach to cancer care. It also explores the problem more deeply across eight diverse countries in the region—Argentina, Bolivia, Brazil, Chile, Colombia, Mexico, Panama and Peru—through country-specific profiles, examining key forces that either enable or resist effective decision-making, alongside opportunities to strengthen capacity and overcome key barriers (see Appendix 2).

Our thanks go to many people for both their time and contributions to our work as interview participants (in alphabetical order):

- **Óscar Arteaga,** Professor, Escuela de Salud Pública, Universidad de Chile (Chile)
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- **Walter Paulo Zoss,** Consultant in Health Communications; Former Executive Manager, Red de Institutos Nacionales de Cáncer (Brazil)

In addition, we are grateful to various stakeholders in the oncology community who may not be listed here for the many informal conversations and opportunities we have had to share ideas on this topic. This research programme was produced by the EIU Healthcare team in 2019. This research was led by Amanda Stucke, with guidance from Alan Lovell, Rob Cook, Marcio Zanetti and David Humphreys. The report was drafted by Adam Green. Contributing research analysts included Flavia Bueno, Alejandro Torres, Rodrigo Gonçalves and Taylor Puhl.

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Executive summary

By 2030, new cases of cancer are expected to increase by 67% in Latin America and the Caribbean. The increase in new cases will range from 23% in Uruguay to 92% in Costa Rica. In 2020 alone over 1.7m people will develop cancer across Latin America and the Caribbean, and more than 1m will die from the disease. Although ageing populations are a significant causal factor, the region is also experiencing many cases of cancer more commonly associated with low- and middle-income economies, such as cervical cancer. Cancer incidence is lower than the global average, yet the relative number of deaths is nearly double that of the US and other developed countries. This is due, in part, to insufficient access to prevention, screening and key therapies and treatments. In Chile, for instance, the mortality-to-incidence ratio, a measure of cancer survival, is 49%, compared with the global high-income peer average of 23%. Argentina and Panama also have mortality-to-incidence ratios worse than their income peer group average.

Cancer not only creates an urgent health challenge in the region, it also brings significant economic costs for patients, their families and public health systems. In 2009 total direct and indirect costs of new cases were approximately US$489m in Argentina, US$1.3bn in Mexico and US$1.6bn in Brazil. Although financial constraints impinge cancer control, some of the costs and inequities are the result of non-financial factors. In particular, decisions shaping the efficiency and inclusiveness of the overall cancer care system are often made in suboptimal ways.

These challenges are driven by several factors. Mechanisms such as health technology assessments and economic evaluations can inform long-term rational choices about whether to adopt and reimburse a given therapy. But these processes are often not in place, are under-resourced or are not effectively translated into standards of care. Cancer care registries and other data sources are developing in the region, but they are still lacking the coverage and quality needed for effective decision-making. In addition, citizens often do not take advantage of legally enshrined rights to screening and diagnosis, owing to poor public health literacy and awareness. Countries could also do more to collaborate in ways that transform the management of the economic constraints that they face, such as pooling together to purchase drugs.

Although these issues are nuanced—and the obstacles vary across contexts—it is clear that there are significant opportunities to improve cancer control in Latin America. With more and better clinical evidence and data, the use of appropriate support tools, and the adoption of mechanisms and growth of institutions with proven efficacy in other contexts, countries can provide more equitable and higher-quality cancer care. This report combines in-depth research, analysis of the decision-making landscape in eight selected countries (see Appendix 2) and a wide-ranging expert interview programme.

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Key findings

1. The creation and proactive use of robust data is critical for decision-making.
Robust data can inform crucial choices such as economic evaluations of new therapies, care pathway decisions for patients and regional resource allocation. Such choices should be based on disease epidemiology rather than merely reflecting wealth or urban service concentration. Conversely, the absence of data could mean that new therapies are adopted without a sufficient understanding of their impact on life expectancy or quality of life, or they may result in the centralisation of services in wealthy urban areas in a way that is unreflective of the real disease burden. Inadequate data could cause missed opportunities, such as the failure to adopt emerging and effective therapies, particularly those that are of high cost.

Key mechanisms to support robust data systems include population-based cancer registries, electronic health records and "real-world" data, such as medical claims. Latin America has made progress in developing such data resources. Brazil stands out as a leader in developing centralised data for the public sector, increasing the use of electronic health records in primary care and running national health surveys. Mexico has the strongest vital registration data of this report's study countries. Regionally, however, improvements are needed. There are roughly 90 cancer registries, but they only cover approximately 20% of the population, and only 7% have high-quality information. There is substantial variability in the structure and content of registry reports, and a need to standardise reports for comparability purposes. There is also insufficient data on the scale and utilisation of electronic health records, and healthcare actors do not yet collaborate in sharing real-world data. Substantial developments have been made around training people to curate and understand real-world data, but workforce shortages are still a challenge for many countries in the region.

2. Effective assessment of data for planning and resource allocation requires holistic criteria, multi-stakeholder involvement and reliable mechanisms and processes to overcome short-term thinking.
Data need to be effectively assessed, for instance, to inform evaluations of whether to approve or reimburse new treatments and pathways. This requires a consideration of clinical and real-world evidence, standards of practice and a clear understanding of local realities. Critical tools to support effective evaluation include health technology assessments and economic evaluations, which inform choices including coverage, therapeutic authorisation and standards of care. More importantly, this can help to improve the relatively high mortality rates in the region, credited to poor availability and access to resources for diagnosis and treatment. Financing for treatment does flow, but it often does so inequitably, because of system-level failures. This results in higher mortality rates due to shortages of treatment modalities such as radiotherapy.

Latin American countries currently show mixed performance in their assessment strategies. Half routinely use health technology assessments, mostly for evaluating medical devices or pharmaceuticals, like immunomodulators. Argentina, Brazil and Mexico formally use systematic processes for decision-making on drug approval and funding. Brazil has a mandatory health technology assessment that includes holistic evaluation criteria for new treatments and technologies. Although still developing, Argentina's assessment activities include an institutional network of 44 universities and

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hospitals. Health technology assessments increasingly use local evidence, but some are still based on international data from more developed markets, which may fail to reflect the Latin American context.

Regional challenges include fragmented services, which make it hard to apply HTA findings uniformly. Other challenges related to health technology assessment include limitations on transparency, methodological quality, accessibility, understanding of outputs for key stakeholders and undue influence from stakeholders with particular agendas. Many countries have laudable commitments to universal health access, which in some cases (such as Brazil) are guaranteed by their constitutions. This requires appropriate use of data to back up policy commitments within the fiscal constraints that they face.

3. Evidence-based decisions must be implemented in a structured way across the care pathway.

Evidence-based decisions and protocols are only as effective as their integration in practice through appropriate supports. When done effectively, this integration can ensure evidence-based decisions achieve the desired ends, from improved patient satisfaction to reduced readmissions, complications and variation in care. This requires embedding the latest protocols into the workflows of all relevant parties, especially clinicians. A key tool to achieving this is an implemented national cancer control plan. These plans can increase the use of evidence in practice, create structured protocols to optimise care and deliver overarching strategic coherence across cancer programmes.

Positively, many Latin American countries have cancer control plans. Peru is one lead case; its *Plan Esperanza* has won plaudits for integrating public-sector services and decentralising cancer control to include marginalised populations. Clinical guidelines and protocols are a second intervention. Reforms in Chile led to a considerable increase in access to services for priority health problems. These reforms introduced multiple mandatory protocols related to insurance coverage, the delivery of interventions by properly registered providers, and rules on waiting times and out-of-pocket cost limits.

On a regional basis, cancer plans vary widely in comprehensiveness and success of implementation. Moreover, countries that have plans should not assume that the task ends there. Cancer control plans must be "live" documents, co-ordinated by government but involving broad consultation from civil society and the private sector.

4. Three foundations can support the above efforts: informed decision-makers, institutions and processes; multi-stakeholder collaboration; and managing misperceptions, bias and influence.

Although this report explores specific mechanisms to support decision-making for policy makers and health system administrators, these should be nurtured and made possible by a set of underlying factors:

- **Decision-makers, institutions and processes** can actively engage with the research community to ensure uptake of the latest rigorous data and evidence. Latin America's academic researchers want to help; survey data from Argentina, for instance, shows that over 80% of researchers have never contributed to decision-making, but over 90% would like to. Bringing academic and government communities together can deliver huge gains for national cancer control efforts. In addition, institutions and processes aimed at supporting the generation and use of robust data, the effective assessment of such data, and the integration of sound decision-making into

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care are critical. These must be both independent from stakeholder interests and supported by multidisciplinary teams dedicated to optimising existing resources for care.

- **Multi-stakeholder collaboration** ensures that diverse perspectives are factored into policy decisions, from non-governmental organisations and patient groups to international agencies. Civil society groups have contributed to regulatory and policy changes such as tobacco control, provided cancer programme monitoring assistance and have promoted public awareness. Within government, greater inter-institutional and inter-agency collaboration can ensure that decisions are aligned with the broad needs of the country and not subject to special interests. Internationally, countries can bring down costs through innovations like pool-purchasing of different treatment modalities, while twinning initiatives with global centres of excellence can improve communication and the sharing of best practices. A spirit of collaboration is a must to ensure that cancer control is inclusive and leverages the power of more than one societal actor.
- **Confronting misperceptions and biases** is critically important, particularly in environments lacking adequate objective evidence. Public- and private-sector actors can be subject to biases and misperceptions, from reluctance to share data to over-treatment or inadequate use of important therapies. Some Latin American governments also have blind spots that can manifest through underspending on areas like cancer prevention while directing resources to more immediate, vote-salient ends. In this way, leaders fail to account for the long-term costs of inaction. Civil society groups also organise around some forms of cancer at the expense of other more avoidable ones, such as a greater focus on breast than cervical cancer.

Through these factors, this report explores the current realities of cancer care decision-making in Latin America, examines how key decisions are made and investigates the support systems and reforms that could improve choices and help to close the cancer care gap in the region.

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Chapter 1: An introduction to cancer decisions and who makes them

Cancer control relies on decisions spanning the full care pathway, from the presence or absence of prevention and screening programmes, to the ways that drugs and technologies are approved for use and reimbursement. It is determined by the choices made by all stakeholders, from heads of state and ministries to researchers, physicians, patients and the private sector, including industry and payers. These critical decisions include what to cover in a national insurance plan, whether to legally mandate universal access to healthcare, and whether to invest and engage in activities like health technology assessment (HTA) and cancer registries. Other choices include what priorities to put forward in a national cancer control plan, and whether to implement strong public health measures like taxes on tobacco consumption or constraints on product marketing.

Cancer care decisions are ideally made against frameworks that judiciously weigh evidence, costs and social values.[1] Evidence-based decision-making at the clinical level, for instance, underlies optimal choices about treatment options. More specifically, population impact evidence has helped to determine the utility of different treatments.[2] Research on vaccination dosage for cervical cancer has enabled savings by demonstrating that two doses of the human papilloma virus vaccine in girls younger than 15 years old provides equivalent protection to the three doses required in women. However, evidence alone does not fully determine decisions. Ethical and social values, such as committing to universal access to health, also shape choices like whether to offer free screening or prevention and early detection measures.[1]

Most decisions are taken without sufficient evidence and data

Decisions are often taken without regard to the best evidence and data, particularly in Latin America. Mr Diego Paonessa, the executive director of the Liga Argentina de Lucha Contra el Cáncer, describes this as a phenomenon where "scarce information causes decisions to be made from 10,000 feet away." Economic choices are also taken without always considering the long-term savings that might result from short-term investments. In 2009 total direct and indirect costs of new cancer cases were approximately US$489m in Argentina, US$1.3bn in Mexico and US$1.6bn in Brazil. Direct costs of lung cancer alone have been estimated at US$1.36bn across the region.[3] The opportunity to mitigate these costs is often overshadowed by perceptions of high up-front investments required for prevention. Laudable ethical commitments like universal health coverage might mean little if the health system cannot accommodate population health needs.

Inadequate decision-making can also lead to the adoption of therapies with limited impact on life expectancy. Conversely, the failure to adopt promising emerging tools like minimally invasive surgery and precision oncology can occur, owing partly to insufficient resources for evaluation. Innovative treatments, regardless of efficacy, are also often costly and therefore less likely to be included in essential benefits packages.[4] Governments may also stop short of making impactful but politically

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challenging decisions such as increasing taxes on tobacco, for fear of social backlash from industry or citizens already facing financial hardship. In addition, with most cancer cases in the region being diagnosed at later stages, decision-makers may feel pressure to find equilibrium between screening programmes and investment in late-stage disease treatment. This report will explore these gaps between best practices and reality in the Latin American context and outline constructive ways to bridge the divide.

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Chapter 2: Why decisions matter: cancer care in Latin America

Latin America faces a "tsunami" of noncommunicable disease, posing a significant challenge for all health systems, according to Dr Felicia Knaul, founder and president of Tómatelo a Pecho—a Mexico-based, breast-cancer-focused non-profit—and a professor at the University of Miami. In the region, Over 1.7m people are expected to develop cancer in the region by 2020, and more than 1m will die of the disease.[5] By 2030 the figures for both new cases and deaths are expected to increase by an average of 67%, ranging from 23% in Uruguay to 92% in Costa Rica.[6] Table 1 outlines key indicators across the cancer landscape.

Cancer incidence remains lower than average, but inadequate prevention, diagnosis, treatment and care lead to high mortality

In Central and South America, the four most frequent cancers among males are prostate (27.6%), lung (9.6%), colorectal (8%) and stomach (7.1%).[6] Among females, the most common type is breast cancer (27%), followed by cervical (12.3%), colorectal (7.7%) and lung (5.5%). Ageing is the principal risk factor for cancer, which bodes ill, given long-term demographic trends. Argentina and Uruguay are a case in point; with mean ages five to ten years older than in the rest of the region, the probability of dying from breast cancer is five to six times higher than the regional average.[7] Lifestyle and infection-related cancers, which can be partially or fully prevented, are also prevalent. At the same time, lower income countries are suffering from cancers that are less common in wealthier contexts; in 2012, there were approximately 36,000 deaths from cervical cancer in the Americas, 80% of which fall in Latin America and the Caribbean.[8] Bolivia's cervical cancer incidence, at 42 per 100,000 people, is the highest in the Americas.

Figure 1. All-Cancer Mortality-to-Incidence Ratios, 2018.

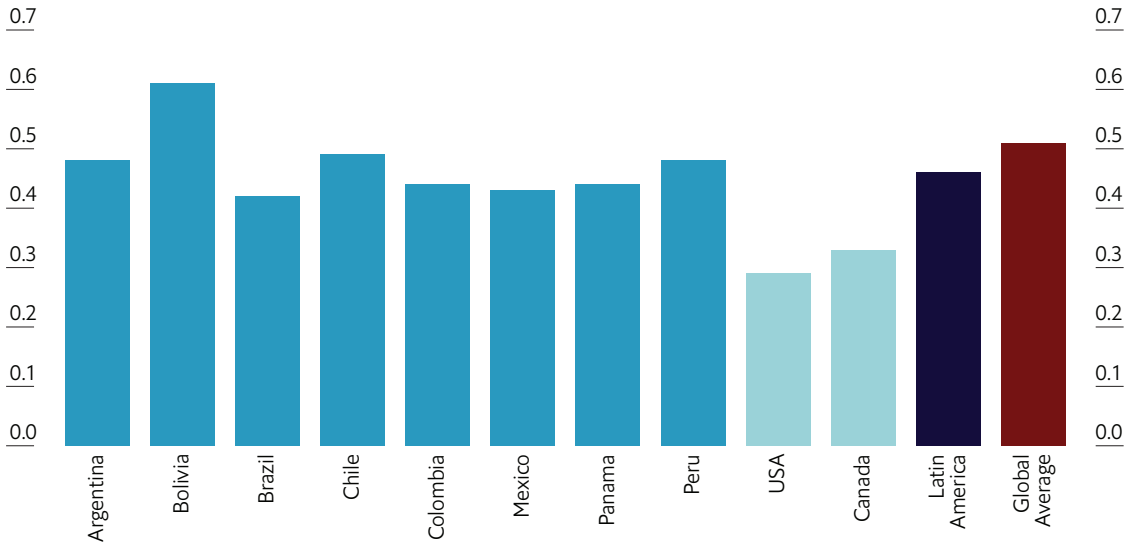

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Table 1. Overview of Cancer in Latin American countries.

Country	Population, m (EIU, 2018)	GDP, US$bn at PPP (EIU, 2018)	Current health expenditure as % of GDP (WHO, 2016)	Cancer incidence rate per 100k (WHO, 2018)	Age-standardised cancer mortality rate per 100k (WHO, 2018)	Cancer mortality-to-incidence ratio (EIU, 2018)	DALYs* per 100,000 due to cancer (IHME, 2017)	Top 3 cancers in men by incidence rate (WHO, 2018)	Top 3 cancers in women by incidence rate (WHO, 2018)
Argentina	44.7.0	971	7.6	218.0	105.4	48%	3,746	Prostate Colorectal Lung	Breast Colorectal Lung
Bolivia	11.2	89	6.9	142.9	87.5	61%	2,689	Prostate Gallbladder Lung	Cervical Breast Gallbladder
Brazil	209.2	3,336	11.8	217.2	91.3	42%	2,901	Prostate Colorectal Lung	Breast Colorectal Thyroid
Chile	18.2	477	8.5	195.5	95.7	49%	3,536	Prostate Stomach Colorectal	Breast Colorectal Gallbladder
Colombia	49.5	737	5.9	178.8	79.2	44%	2,268	Prostate Stomach Colorectal	Breast Colorectal Thyroid
Mexico	130.8	2,521	5.5	142.7	61.1	43%	2,040	Prostate Colorectal Testicular	Breast Thyroid Cervical
Panama	3.7	105	7.3	173.0	76.6	44%	2,197	Prostate Colorectal Stomach	Breast Cervical Colorectal
Peru	32.2	407	5.1	192.6	92.9	48%	2,087	Prostate Stomach Colorectal	Breast Cervical Stomach
Latin America	-	-	-	189.6	86.5	46%	2,603	Prostate Colorectal Lung	Breast Colorectal Cervical
Global Average	-	-	10.0	197.9	101.1	51%	2,901	Lung Prostate Colorectal	Breast Colorectal Lung

GDP – gross domestic product | PPP – purchasing power parity |DALYs – disability-adjusted life-years

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The number of cases is only part of the worry, as cancer incidence in Latin American countries tends to fall below the global average. The greater concern is the deficient quality of care received; the mortality-to-incidence ratio for the region, thought to be an insightful indicator of cancer management and outcomes, is nearly double that of the US and other developed countries (see Figure 1).[9] This is credited to inadequate prevention, diagnosis, treatment and care. This chapter outlines key gaps across the cancer journey in more detail.

Tackling smoking and other risk factors will reduce incidence

While the aetiology of cancer is phenomenally complex—and still the subject of much debate and disagreement—modifiable environmental and lifestyle factors clearly increase risk. In Latin America, key risk behaviours such as smoking are rife. Whereas the likes of Uruguay have taken strong measures to constrain tobacco consumption, smoking rates are high in Chile, Cuba, Guatemala and Bolivia.[10] Human papilloma virus is a second risk, associated with cervical, head and neck malignancies. Vaccinations against human papilloma virus are underutilised, even though the virus is the leading cause of cancer in Latin America—the prevalence of this virus in the region is also twice as high as the worldwide average.[11] An estimated one-third of cancers could be prevented by reducing risk factors like tobacco use and increasing vaccination.[12]

Genetics also confer significant cancer risk, yet national cancer plans often fail to include genetic testing or research support for the development of cancer prevention programmes.[13] One challenge is that cancer prevention costs money—and it is only beginning to be appreciated as a money-saving intervention in the long term, argues Mr Paonessa. Greater investment in health literacy, including raising awareness about symptoms and risk factors, is urgently needed. "We need to build new hospitals, but it is more important to invest in strengthening a culture of prevention, health promotion and education of the people to keep them healthy," says Dr Milton Soria, Diagnostic Unit Coordinator at Bolivia's Institute of Health Laboratories.

Earlier screening and diagnosis should be prioritised

Early screening and diagnosis can detect cancers before they advance and greatly improves prognosis. But there are currently major gaps in screening provision, especially along socio-economic and urban-to-rural divides. Patients of lower socio-economic means generally have a worse prognosis, as their participation in screening is lower, leading to higher incidence of locally advanced and metastatic disease.[14] In the US 60% of breast cancer occurrences are diagnosed in the earliest stages, compared with 20% and 10% in Brazil and Mexico respectively.[7] In thinking about the future of cancer control programmes, Dr Óscar Arteaga, a professor of public health in Chile, asserts that "any programme will need the ability to mobilise human resources in a transient way to rural regions, or the ability to mobilise patients to health centres."

Social and cultural barriers, including fear and stigma, also partly impede screening and diagnosis. Women may be embarrassed or worried by procedures related to female cancers, for instance.[15] Lack of awareness is another. In Bolivia, screening is freely available, but its uptake is low owing to lack of awareness. For example, the Papanicolaou test (Pap test) for cervical cancer is performed in around 20-22% of patients, compared with 42% in other countries in Latin America.[16] Many women who undergo screening are also not proactively informed of results, presenting a further delay to treatment.

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Speed of diagnosis is generally too slow. For example, most lung cancer patients (70%) are diagnosed when the disease is in advanced or metastatic stages, as a result of too few early detection and screening programs. This is especially true in rural settings.[5] In Mexico, oncologists claim that late diagnosis caused by delays between patient visits is one of the most significant variables affecting outcomes.[17] In Brazil, lung cancers can take up to seven months to diagnose. A broader survey of experts from government authorities, cancer institutions, and professional societies across 12 countries in the region showed that around 30% of patients waited more than three months for a diagnosis at a country level.[18]

Along with public awareness, other constraints include a lack of high-quality laboratories for histopathological analysis, which leads some decision-makers to prefer to send samples abroad for higher-quality results, resulting in both delays and higher costs. Further delays often occur following diagnosis, because of, for example, lengthy processes around reimbursement or the unavailability of treatment.

Treatment is often insufficient and fragmented in delivery

Once diagnosed, access to treatment varies considerably across and within countries. Financial coverage is one problem. In Peru, public health insurance covers diagnosis for breast cancer, for instance, but not treatment.[7] In some contexts, notably Brazil and Colombia, patients unable to access or finance treatment choose to take their case through the courts, as the constitution gives them the right to health access.[19]

Finance does flow for treatments but in highly unequal ways, in large part because of system-level failures. "The fragmentation of health systems between social security, non-social security, private sector salaried workers and public sector salaried workers is a systemic barrier to access and equity" says Dr Knaul. "For example, one group will have access to radiotherapy and another group that lives in the same city will not be able to access that facility because there is no way to move funds between insurers or providers, even if they are both public. So patients have to travel to another city which is costly for them and for the health system." This means that, outside of resources for surgical intervention, which often overlap with other clinical areas beyond oncology, the landscape of cancer-specific treatment modalities in the region is complex.

Radiotherapy is an under-resourced, critical component of treatment, and is undergoing re-invention

Radiotherapy is a key treatment modality at both the curative and palliative stages. Existing radiotherapy is primarily three-dimensional conformal radiation therapy, although intensity-modulated radiation therapy is increasingly favoured across several disease sites.[20] Radiotherapy demonstrates positive treatment outcomes in economic terms because it is efficacious, most people are treated as outpatients, equipment lasts over time if adequately maintained and throughput on equipment is high.[21] Although radiotherapy has been available for many decades, it is now benefitting from considerable innovation as part of the wider surge in precision medicine.[22] Precision radiotherapy, by delivering higher-dose radiation to smaller areas, has been shown to more aggressively attack tumours without damaging surrounding healthy tissues. Other emerging innovations include cloud-

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based capabilities such as real-time, image-guided adaptive radiotherapy; fixed-beam radiotherapy units that reduce infrastructure and staffing costs; and cloud computing, which can facilitate collaboration and quality assurance.[23]

Availability of radiotherapy is variable in Latin America, with six countries across the region lacking the resource entirely.[5] Reasons for this include a deficit of trained personnel, a lack of clinical protocols and validated procedural manuals, and missing or non-adoption of quality management systems.[24] In some contexts, equipment shortage—rather than human capacity—is the issue; in Bolivia, for example, the workforce for delivering radiotherapy is strong, but there is a lack of equipment and resources.

Even in countries with adequate access to radiotherapy, some are using machines that are more than 40 years old, resulting in poorer outcomes than seen with newer technologies.[25] According to Dr Arthur Rosa, president of the Sociedade Brasileira de Radioterapia, approximately 50% of the radiotherapy machines in Brazil's public health system, the Sistema Único de Saúde, will be considered obsolete by 2021. This is also reflected in a recent radiotherapy census conducted by the ministry of health. Despite the International Atomic Energy Association's Directory of Radiotherapy Centres database, the most complete data on radiotherapy availability worldwide, there is little information about the condition of the equipment and associated human resources to use it in Latin America, hampering decision-makers' ability to understand the true need. Estimates suggest that, across the eight countries in the region included in our study (see Appendix 2), most only have 50-75% of the needed coverage for the cancer patients, more than 50% of whom require radiotherapy. There are also significant disparities in access between health systems and across the rural–urban divide.[26]

While chemotherapy is often better resourced than radiotherapy, access remains variable

Chemotherapy is usually given as an adjuvant or pre-surgical (rather than primary) treatment for many of the cancers common in Latin America.[7] Systemic chemotherapy includes any pharmaceutical treatment that interrupts cell division or otherwise disrupts growth of neoplastic cells. Some forms of chemotherapy, such as platinum-based salts, destroy any rapidly growing cell, including those in the gut, and are accompanied by significant side effects. Most require specialist supervision for calculation of doses, administration and monitoring for adverse effects. Generally, patients must be relatively fit to endure chemotherapy, so it is often not an option for the elderly and immunocompromised populations.

Affordability varies for different treatments, and there is some evidence of providers treating patients with inappropriate or ineffective chemotherapy because it is the most easily available (or only available) treatment modality. Other than Peru, chemotherapy is generally available in public health systems across the eight countries included in this study.[27] However, there is wide variation in access, particularly among high-cost treatments. This is partly credited to lack of evidence, and lack of patient participation in research and decision-making.[28] Of the 24 essential medicines for oncology cited by the World Health Organization, only Mexico reports reliable access, with other countries citing challenges with budget capitation, supply chains and manufacturing.[29] The requirement for regular specialist inpatient treatment and continuous monitoring also makes chemotherapy inaccessible for those in remote locations, though some novel tele-chemotherapy efforts have sought to address these gaps.[30]

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Emerging treatments promise much, but remain out of reach for many

The availability of other emerging treatments is beginning to grow in the region, including precision oncology. This involves the profiling of tumours to better predict treatment planning and efficacy.[31] Although rapidly expanding in high-income countries, the application of precision oncology in lower-income settings is hindered by the requirements of rapid transfer of tissue samples to high-quality laboratories, coupled with the need for access to next-generation sequencing to enable molecular analysis.

Precision oncology's success in the West for cancers that are common in Latin America suggests that the market for such treatments might grow, though it is often impaired by high prices. For example, immunotherapy agents are subject to an extended wait before approval, only for their use in care to be restricted owing to the high cost.[5] However, the overall economic case could change as evaluations become more sophisticated. It is suggested that close to 50% of treatments with chemotherapy for breast cancer, for instance, are inaccurately prescribed because not enough is known about which receptors are expressed on the surface of the tumour cells.[18]

Palliative care is often lacking in both resources and specialist support

Palliative care provision across the region is heterogeneous, with most countries at Level 3 of the Wright classification. This classification, a measure of palliative care development, means that services are developing but are isolated from other clinical services.[32,33] Because of the likelihood of many cancers already being at an advanced stage when diagnosed, integrating these services should be a priority across the region, in tandem with efforts to shift diagnosis earlier. The burden of symptoms such as pain and sickness are high, even for those receiving active treatment, so palliative care plays an important role from the point of diagnosis. Developments in systemic palliative care include the use of precision radiation oncology, although significant barriers to access exist throughout the region.

In addition to shortages of resources for effective palliative radiation, access to morphine and its analogues is variable because of prohibitive regulatory control, formulary deficiencies and "opiophobia" leading to undertreatment.[34] In Argentina, Bolivia, Ecuador, Mexico and Brazil, oncologists are only allowed to prescribe opioids with special permission and with limits on dosage in some cases.[35] The number of palliative care educators with input into medical education varies from zero (Bolivia) to 45 (Mexico).[32] Only Chile, Colombia and Mexico have specific palliative care policies, although some national cancer control plans include palliative care. Most palliative care provision is home based, with few hospices or specialist input facilities.

In addition to screening, diagnosis and treatment, resources to ensure proper case management and follow-up are still developing. Filling these gaps does not just require more resources; existing resources must also be used more strategically. By relying on evidence and effective, independent processes to guide decisions that impact care, Latin American countries have an important and practical opportunity to address these gaps and improve care outcomes.

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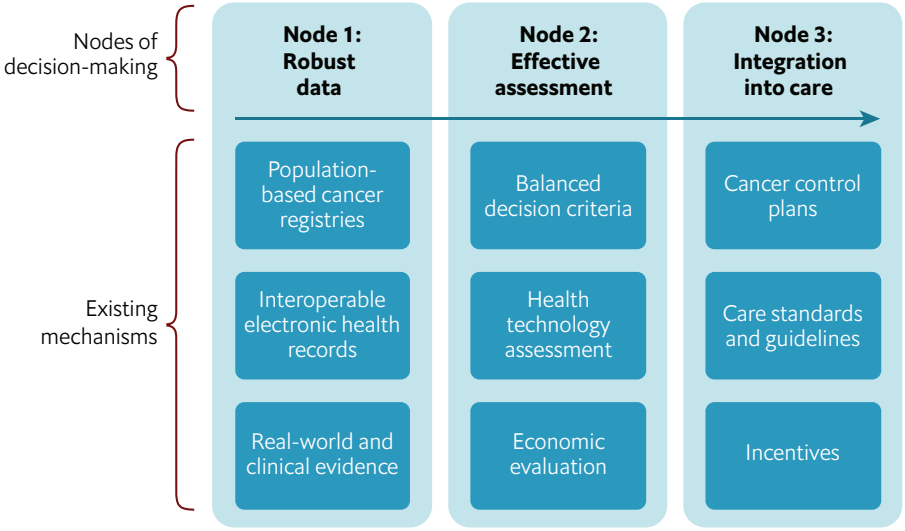
Chapter 3: Closing the gap through evidence-based decision-making

Latin America's cancer care gap is only partly a reflection of economic constraints, despite these being commonly cited as the primary source of the region's challenges. The care deficit is also—and perhaps to a greater degree—a consequence of such factors as choices being made without sufficient evidence; best practices that exist on paper but not in reality; and the presence of influences, misperceptions and biases. Although these influences are not unique to Latin America, the region has some significant opportunities to address them in ways that optimise current resources and provide a more strategic approach to cancer care.

Chapter three explores key mechanisms that can improve decision-making across three "nodes"—robust data, effective assessment, and integration into care (see Figure 2)—and describes trends, case studies and best practices in Latin America across each node.

Figure 2. Nodes of decision-making and existing mechanisms.



Source: Economist Intelligence Unit.

Node 1: Robust data, including patient registries and electronic health records

Robust data is a key component of decisions made across the cancer care spectrum. For example, incidence data on breast cancer aids resource allocation decisions and calculations on financial savings achieved through early diagnosis and prevention interventions. Lack of clinical and real-world evidence, in contrast, means that new therapies or approaches are adopted without sufficient understanding of their impact on life expectancy or quality of life. Decision-makers may also fail to utilise evidence of effective emerging but high-cost therapies. Paucity of data can result from multiple factors, including the absence of information infrastructures like cancer registries and

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electronic health records, and the pharmaceutical industry's limited interest in researching cancers significant to low- and middle-income countries, such as cervical, stomach and liver cancer.[8]

Latin American countries vary widely in their investment in collecting and curating data. Brazil, for instance, is ranked as a more advanced environment for cancer decision-making in this analysis, thanks in part to a centralised health data system for the public sector, and the growing use of electronic health records, national health surveys and registries (see Appendix 2). But many countries, including Brazil, face challenges and gaps, including a lack of population coverage among data sources. Furthermore, inadequate use of real-world data, data from HTAs and cost-effectiveness studies reduce capacity for strategic planning. This can, for example, lead to significant gaps in access to treatment, helping to fuel the higher-than-average mortality rates seen in the region. Many countries have data available, but it is often incomplete and only represents a small portion of the population, according to Dr Carlos Barrios, director of the Latin American Cooperative Oncology Group. There is also a personnel and infrastructure issue; countries need more people trained to curate and understand diverse forms of data, as well as mechanisms to integrate information into key decision processes.

Population-based cancer registries

Population-based cancer registries (PBCRs) are important mechanisms that collect and classify information on new cancer cases in a defined population, showing incidence, patterns, trends and survival. Usually hosted or convened by governments, these registries enable the systematic tracking of outcomes, help to inform health service quality and access, and are a cornerstone for cancer planning, monitoring and evaluation.[36] Accurate, timely and complete case ascertainment is essential to data quality. Cancer registries require a system for classification and coding of cancers (and clear definitions of what constitutes a cancer case); definition of the date of incidence; and rules for dealing with multiple primary cancers, including the need to differentiate a new case of a primary cancer from the extension, recurrence, or metastasis of an existing one. National cancer plans (discussed later in this report) are also strengthened when they are predicated on high-quality data from PBCRs.

PBCRs in Latin America: the registry landscape is evolving, but too slowly

The registry landscape in Latin America is continuously evolving. Recent advances include the initiation of treatment outcomes data collection for Non-Hodgkin's Lymphoma in Brazil.[37] This kind of data collection enables care improvements such as validation of treatment doses and making a stronger case for early diagnosis. It does this by allowing for the correlation between diagnosis and prognosis. Chile, which has three established regional registries, has three more in development. Argentina has established the Institutional Tumour Registry of Argentina, which has brought systematised information on patient care in public institutions for the first time.[38]

Despite recent progress, however, registry coverage and quality of data are patchy. The 91 PBCRs in Latin America cover only 20% of the population, and only 7% have high-quality information; by comparison, coverage is estimated at 83% in North America and 32% in Europe.[6] Although they are expensive to implement, the current lack of comprehensive registries makes it difficult to undertake evaluations with respect to

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policy-level interventions. Many countries instead extrapolate from cities to justify an increase or decrease in their budget, claims Mr Paonessa. To be useful for public policy, registries should cover 30% of the population to account for socio-demographic heterogeneity, such as that between urban and remote rural populations, says Dr Eduardo Payet, executive director of epidemiology and cancer at Peru's National Cancer Institute. He adds that sufficiently broad registries could feed into organisations such as the International Agency for Research on Cancer and help to build regional projections and estimates, and enable the creation of systematic, planned programmes.

Improving registries requires the greater involvement of local stakeholders and experts, integration into existing surveillance systems, improvement in data availability and quality, enhanced dissemination, and better linkages between cancer registries and cancer planning and research.[6] There is also substantial variability in the structure and content of registry reports in the region, leading to the need for standardisation.

Electronic health records and real-world data

Electronic health records are data repositories broadly covering the health status of an individual person. These records are often stored and transmitted securely by multiple users in a standardised format, and aim to support efficient and high-quality care.[39] They also support decision-making via multiple channels, including improving administrative efficiency and integration. In addition, they accelerate medical consultation appointments and scheduling, and can increase the speed of diagnosis and treatment.

Well-designed electronic health records reduce overall administration load, freeing up provider time to focus on patient care. They can also increase physician confidence to make decisions by showing all relevant patient information and past history, and reduce the occurrence of mistakes and errors, such as those that might result from illegible paper prescriptions.

Electronic health records can also support wider epidemiological surveillance, deepening the pool of real-world data, along with other sources like reimbursement and prescription claims. As part of a wider eHealth agenda, electronic health record data can support the rollout of universal health coverage by tracking services and needs among remote and underserved communities, as well as guiding health workforce training through e-learning.[40]

Node 2: Effective assessment means more than having an HTA institute

The second decision node is effective assessment, which includes the ability to process data generated by information systems, evaluate it using a holistic approach, and use it to drive strategic and evidence-based care decisions. A specific example, particularly relevant to cancer care, includes ways in which possible treatments and pathways are evaluated for approval and reimbursement. This requires consideration of clinical evidence around efficacy and, ideally, real-world outcomes in the local population. In all of these areas, it is vital that the outcome can be anticipated, the quality of the clinical evidence can be appraised and that the intervention is realistic in the specific health system's context. Decisions are a composite of these factors. No single criterion can be omitted from the decision-making process and weighting between them should be appropriate.

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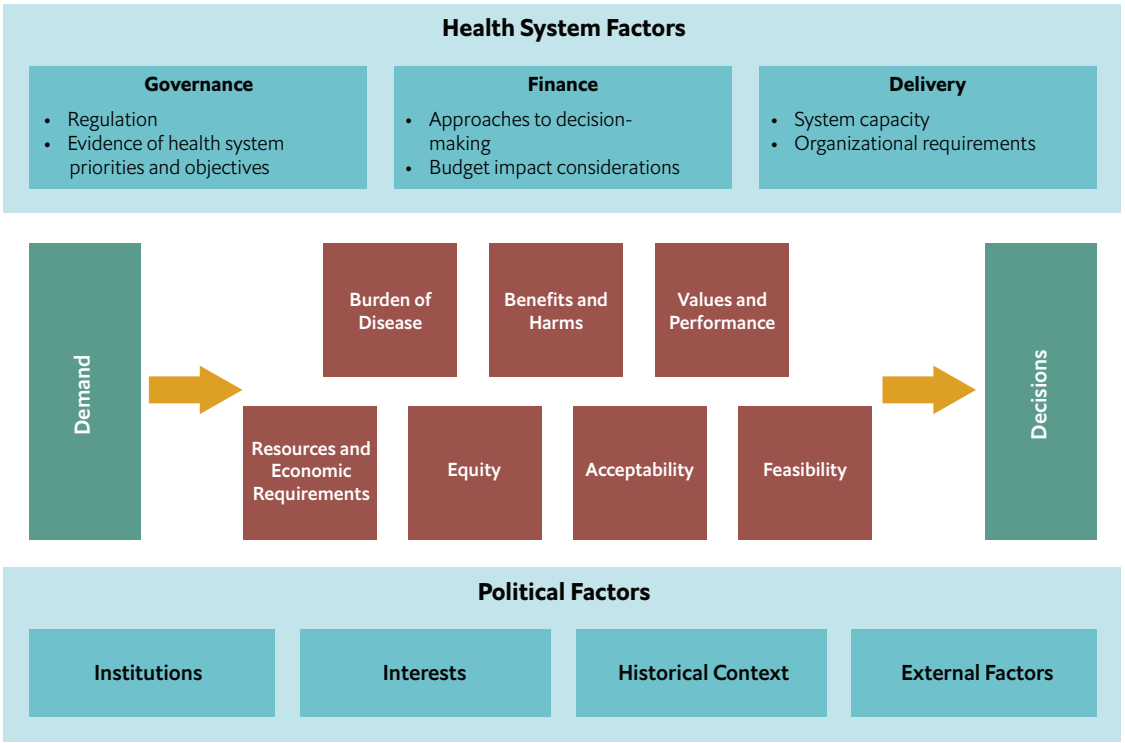
Many frameworks, specific to the health sector, have been developed for this purpose, including the Grading of Recommendations Assessment, Development and Evaluation (GRADE) working group's Evidence to Decision framework (see Figure 3).[1] By ensuring that decision-making processes take into account indicators and influences that best align with value for patients (highlighted in the red boxes), health systems can more effectively allocate current resources and identify primary areas of need for new resources when assessing evidence for decision-making.

Figure 3. Adapted GRADE Evidence to Decision framework for decision-making.[1]



It is essential to identify when, where and how therapeutic innovations will lead to demonstrable improvement in outcomes, otherwise treatments can be adopted without producing meaningful value. Conversely, promising treatments may not be adopted owing to high up-front costs, despite displaying a long-term benefit in terms of survival or prevention rates. Structured assessment mechanisms, such as HTAs and economic evaluations, can help to facilitate a more effective understanding of the impact of certain treatments or approaches, specific to a country's context.

HTAs and other economic evaluations

An HTA is perhaps the most promising mechanism for effective evaluation, as it undertakes analysis of the properties, effects and impacts of devices, medicines, procedures or systems.[41] The HTA process is a multidisciplinary effort to evaluate social, economic, organisational and ethical issues to inform choices that weigh fiscal costs with expected impact. HTAs inform multiple decisions, including advising a regulatory agency about authorisation and use of a technology, supporting coverage decisions for payers, advising clinicians and patients about the proper use of a health technology, and guiding disinvestment in ineffective treatments.

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Economic evaluations more generally have been shown to provide prospective cost-effectiveness analysis that provides the necessary information needed to scale up screening and preventive care.[42] Such evaluations should be included in mandatory HTA processes, but agencies will often conduct an economic evaluation, such as a budget impact analysis or cost-effectiveness study independent of a complete HTA for a particular technology.

HTAs in Latin America: more integration is needed

Around half of Latin American countries routinely use HTAs in some form, mostly for the acquisition of medical devices or pharmaceuticals such as immunomodulators.[43] Argentina, Brazil and Mexico formally use systematic HTAs for decision-making for treatment approval and funding.[4] Brazil has a mandatory, time-bound national HTA system that includes holistic evaluation criteria for new treatments and technologies. The Comissão Nacional de Incorporação de Tecnologias no Sistema Único de Saúde, the body responsible for HTAs in Brazil, plays an important role in advising the Ministry of Health on new technologies and the production or modification of clinical protocols and guidelines. Argentina's own assessment body, the Instituto de Efectividad Clínica y Sanitaria (IECS), which stands out as one of the more developed HTA agencies, co-ordinates national and regional projects and produces guidance for decision-makers.[44, 45] There are also collaborative efforts across the region. The Red de Evaluación de Tecnologías en Salud de las Américas is a network of health ministries, regulatory bodies, HTA agencies, WHO collaborating centres and academic institutions.[46] Its database of over 1,300 current HTAs disseminates important information and prevents duplication.

Governments and health agencies are improving economic evaluation research overall, argues Dr Soria. This includes increasing the amount of teaching provided to specialists in health economics; although, he adds, "we are just getting started in the implementation of health economics into decision-making".

As Dr Soria suggests, links between economic evaluation (including HTAs) and decision-making are largely inadequate.[47] Challenges include the pluralistic and fragmented structure of healthcare services, which makes it difficult to apply HTA findings uniformly, especially across both public and private payers.[47, 48] In Mexico, for example, the use of HTAs is largely confined to healthcare delivery in the public sector.[49] Even in the highest strata of government, there are also often other pressures, including from patients and the media, that end up influencing decision-making more than structured assessments.

There is also a need for a "last-mile" focus. Studies of the implementation of health technologies identify the need for more than just acquisition of additional equipment and staff resourcing. One team studying the implementation of intensity modulated radiation therapy in a hospital in Mexico identified the role of multi-professional planning, education and the development of quality-assurance processes as fundamental to success.[50] Other HTA-related challenges cited around the region include limited transparency of HTA processes, ensuring methodological quality, accessibility of the completed assessments, understanding of outputs among key stakeholders, limited resources to conduct HTAs, and undue influence from stakeholders with particular agendas.[43] Ensuring that infrastructure is in place to address

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and overcome these barriers can support a stronger link between HTAs and decision-making.

Lastly, although economic evaluations are crucial, decisions are also shaped by values and social norms. For instance, a cost-benefit analysis may lead to a *prima facie* rejection of a treatment of late-stage cancer, but if the country has a constitutional commitment to healthcare access, such a result would not be sufficient to determine a decision. This makes the use of holistic, local criteria all the more important.

Other assessment tools

Beyond economic evaluations and HTAs for specific treatments, governments can use other tools to assess their resources and performance around cancer care more widely. The WHO's Country Capacity Survey collects data on factors that are most important to being able to effectively address NCDs, including cancer.[51] Measures include whether countries have operational cancer plans and policies, screening programmes, and dedicated cancer programmes in place. Assessing and using this data may help to foster collaboration and shared learning across countries and regions to better maximise resources.

The International Atomic Energy Agency, in collaboration with the WHO, offers the integrated mission of Program of Action on Cancer Therapy (imPACT) review, a partly in-country review that some countries in the region have already conducted.[52] An imPACT review serves as a holistic needs assessment tool to evaluate cancer control infrastructure and capacity, and can help to underpin successful cancer planning and national cancer control plan development. Programmes such as imPACT reviews and the WHO Country Capacity Survey help to ensure that governments can identify key gaps and strengthen their cancer control programmes to address priority needs.

Node 3: Integration into care via national cancer control plans and clinical guidelines

Evidence-based protocols and decisions are only as effective as their integration in practice. Incorporation into the care delivery system must be ensured through appropriate supports. When done effectively, this integration can ensure that evidence-based guidelines and decisions achieve the desired ends, from improved patient outcomes to more effective and sustainable use of resources. This requires embedding the latest protocols into the workflows of relevant parties, especially clinicians and health system administrators.[53]

National cancer control plans (NCCPs)

Cancer control programmes at the national level are designed to reduce cancer incidence and mortality and improve patient quality of life through systematic implementation of evidence-based strategies for prevention, early detection, diagnosis, treatment and palliation. They are the total of all cancer prevention and control activities taken within a country, and are fundamental to the organised governance, financing and delivery of care.[18, 54] NCCPs capture the guiding strategy for national programmes. If designed well, they can increase the use of local and international evidence in policy and programme decisions, optimise resource allocation, co-ordinate actors and ensure accountability. They also improve outcomes by providing overarching coherence; countries that have an NCD plan but lack an NCCP are less likely than countries with both, or even those with only an NCCP, to have a comprehensive, coherent or consistent cancer control programme. [55]

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Although there has been an increase in the use of NCCPs globally, there is little evidence showing their effective implementation in Latin America.[55] Critical gaps exist around the setting of realistic priorities, specification of programmes for cancer management, allocation of appropriate budgets, monitoring and evaluation of plan implementation, promotion of research and strengthening of information systems.

NCCPs in Latin America: false starts, or none at all

Several Latin American countries lack formal implementation of NCCPs. In addition, basic NCCP elements, such as population-based cancer registries, are missing or implemented with a limited scope.[18] One review found that cancer control plans—either comprehensive or for specific cancers—are only used by 11 of the 19 member countries of the IARC Regional Hub for Cancer Registration in Latin America.[6] In most cases, those that do exist are integrated into broader NCD plans and have been developed recently. Challenges include a lack of information on financing and implementation of cancer control activities at a regional level, and a mismatch between plans on paper and reality. "Several countries have developed programmes that were never implemented," says Dr Luiz Antonio Santini, former general director of the National Cancer Institute in Brazil. Countries without NCCPs have worse outcomes, but simply possessing a plan does not in itself drive change. It must be articulated with policies that guarantee access to quality health services with the appropriate resources.

Peru developed its own cancer control plan, Plan Esperanza, in 2012, and is due to release an updated version. Its goals, including comprehensive care coverage for 12m lowest income citizens, strengthened public-sector services to support prevention and early detection, and decentralisation to reduce geographic disparities.[56] Plan Esperanza has won plaudits for showing that it is possible to integrate public-sector services and decentralise cancer control to provide unbiased services to all communities, including marginalised populations, to reduce gaps in geographic and economic access.[57]

Clinical guidelines and incentives

Clinical guidelines are recommendations for clinicians and institutions that are designed to optimise patient care. They are usually informed by a systematic review of evidence and an assessment of the benefits and harms of alternative options. Although most countries in Latin America possess such guidelines, recommendations are often insufficiently utilised.[7,18] This "evidence-practice" gap is in part a consequence of guidelines being created using clinical evidence primarily from randomised controlled trials or adapted from guidelines in high-income countries with more developed healthcare services. Dr Barrios explains that "participation of local experts to find local solutions is essential... We need to recognise that solutions need to be context-dependent; what works in the US or EU does not necessarily apply to other regions of the world." A lack of culturally contextualised evidence also inhibits the usefulness of guidelines in practice.[58] For example, Brazil has long-established breast-cancer screening guidelines, but adherence is variable; women are frequently screened at a younger age and more frequently than recommended, leading to system inefficiencies.[59] In Argentina, adherence to the

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Barcelona Clinic Liver Cancer therapeutic algorithm showed that fewer than half of patients newly diagnosed with hepatocellular carcinoma received recommended treatment.[60]

Guideline quality needs to be ascertained before widespread adoption, using a system such as that developed by the GRADE working group.[61] The GRADE approach has been adopted by over 100 organisations globally, including the National Institute for Clinical Excellence (NICE) in the UK. NICE is generally viewed as one of the world leaders in ensuring evidence-based and cost-effective clinical practices. Moving from evidence to decision-making requires both evaluation of quality of guidelines and appraisal of how to implement their recommendations.

The process of implementing evidence in practice can be aided by the use of evidence-to-decision frameworks (see Figure 3).[62] Such frameworks can also facilitate dissemination of guidelines and enable decision-makers in other jurisdictions to adopt or adapt recommendations to their context.[63] WHO-INTEGRATE, an evidence-to-decision framework thought to be somewhat more tailored to decision-makers in Latin America, has a scope that includes six criteria: the balance between health benefits and harms; human rights and sociocultural acceptability; health equity, equality and non-discrimination; societal implications; financial and economic considerations; and feasibility and health system considerations.[64] Incentives can also ensure that guidelines and other mechanisms are followed in real-world settings.

Chile provides a useful case study for the benefits of structured protocols and guidelines in improving care. A 2004 health reform plan, El Plan de Acceso Universal a Garantías Explícitas (AUGE), mandated coverage for a set of interventions aimed at the prevention and early detection of chronic diseases, including cervical cancer. It is comprised of four guarantees for recipients of social health insurance: access (insurers must cover a set of health interventions related to priority diseases); quality (interventions must be delivered by a properly registered and certified provider, who are incentivised to practice in accordance with clinical guidelines); timeliness (waiting time for interventions must not exceed explicit limits); and financial protection (insurers must reimburse an explicit amount for each guaranteed health intervention to ensure that the beneficiary's out-of-pocket spending does not exceed a predefined share of household income).[65]

Chile's reforms have led to a considerable increase in access to services for 56 priority health problems. Coverage rates for selected diseases have increased considerably, and the case–fatality rate has dropped. These favourable changes are attributed to improved quality of care made possible through the implementation of standard treatment protocols. In cancer specifically, Plan AUGE's prevention protocols have made it possible to detect some cancers earlier, supporting timely treatment. Bolivia is the most recent country to join Chile in guaranteed care for cancer patients. In September 2019, the government promulgated a Cancer Law with aims to guarantee universal and comprehensive access across the care pathway, based on the country's epidemiological profile and health financing.

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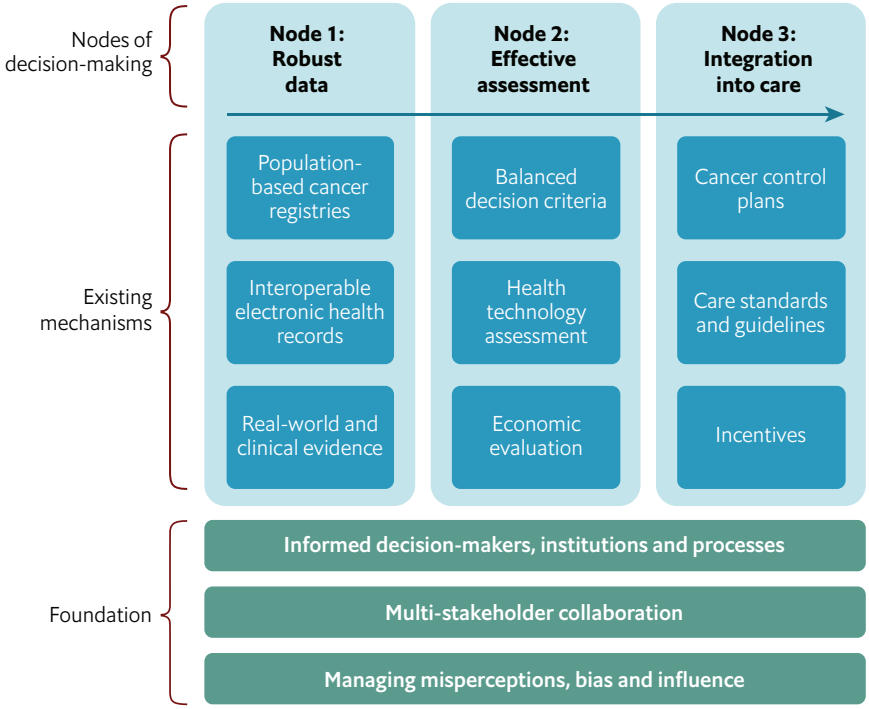
Chapter 4: Laying the groundwork for effective decision-making

The mechanisms explored in chapter three describe specific tools to aid decision-making across three nodes: robust data, effective assessment and integration into care. However, there are wide, diffuse factors that interact with and support the deployment of these tools in practice. Chapter four explores three foundational elements that shape an overall environment conducive to evidence-based decision-making: informed decision-makers, institutions and processes; multi-stakeholder collaboration; and managing misperceptions, bias and influence (see Figure 4).

Figure 4. A model for understanding cancer care decision-making.



Source: Economist Intelligence Unit.

Decision-makers, institutions and processes must rely on local expertise

Beyond being able to access evidence, decision-makers must be equipped with the skillset to understand evidence, anticipate its implications in the real world and effectively implement it into their decision-making processes. For instance, if government decision-makers do not engage with the academic community, policy choices will be disconnected from the latest research. There needs to be a culture of exchange between these two societal actors. Low- and middle-income countries do often suffer from a weaker research base than high-income countries, but there is much variation across contexts. Where there is an active and motivated research community in Latin America, the linkages with decision-makers must be strong to ensure that the latest evidence is accessible.

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One survey-based study in Argentina, for instance, revealed that despite the country's long-standing scientific tradition, there are few institutionalised linkages between health researchers and policymakers. Over 80% of researchers had never been involved in or contributed to decision-making and over 90% said that they would like to play a part, demonstrating a willingness also reflected in the formation of the Argentine Forum for Health Research.[66] The survey showed that researchers considered Argentinian decision-makers insufficiently aware of the most urgent problems in the country and over 90% of researchers believed decision-makers to have "little to no" knowledge of research. Worryingly, five out of six researchers who had previously been involved in policy-related decisions rated research knowledge among decision-makers to be poor.[66]

Barriers to the utilisation of research include institutional factors, like departmental silos between ministries of health and science and technology ministries, and informal network factors, such as a lack of exchange between research groups and public health policy communities. A preference for government-originating research, with a lack of utilisation of work by universities, was another. Some countries, such as Bolivia, are aiming to bridge these gaps by also developing programmes for medical students and people working in health systems to to engage with the evidence base and use it in their duties. Ties between the health and education systems can strengthen the ability for decision-makers and those advising them to be better able to make evidence-based decisions.

There are positive signs of the region's research capacities and contribution. Through concerted efforts, Chile has seen an increase in scientific productivity, as manifested in publications, patents and the growth of a skilled workforce. The country's academic programme in Pharmacoeconomics and Health Technology Assessment is also the first of its kind in the region; it aims to support the development of a workforce that is able to generate and integrate meaningful evidence for decision-making.

More generally, processes for gathering and curating robust data, assessing it effectively, and integrating results of analysis and decisions into care is a complex process that requires well-established, independent and accountable institutions. These might include more country-specific institutions, such as HTA bodies or traditional functions within a ministry of health, or it may include more multi-disciplinary processes and bodies, such as regional working groups and committees.

Multi-stakeholder collaboration is needed at all levels

Decision-making should not just involve health ministries, health system administrators, the private sector and physicians. It requires wider engagement with civil society and academic partners, as well as other countries' governments and international agencies. Inclusive decision-making can democratise policy and ensure that diverse views are factored into legislation or programs. It can also help stakeholders to pool their resources. "You need to involve all the actors; you need to mobilise the private sector, the public sector, the army, the civil organizations, the NGOs. This involves us all," says Dr Payet.

As Dr Payet suggests, non-governmental organisations (NGOs) can play an instrumental role. In Brazil, NGOs advocated for a Supreme Court intervention allowing the regulatory agency to ban additives and flavours in cigarettes that, critics believe, increase their appeal to children and young people.[67] International agencies have also helped to lobby for rights- and values-based changes.

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Campaigns by the Pan American Health Organization and the Bill and Melinda Gates Foundation, for example, have enabled changes such as allowing women time off work to take Pap tests for cervical cancer. Civil society groups also foster openness and transparency, such as Brazil's Todos Juntos Contra o Câncer, or "all against cancer", which established an observatory to monitor the implementation of cancer care policies.[68]

At the government level, more inter-institutional collaboration can be pursued to review interventions and provide recommendations to ministries. This could include academics, clinicians, civil society, policymakers, the private sector, NGOs and the palliative care sector. "Having that sort of interdisciplinary review and evaluation of technologies and medicines helps to avoid the concern that a particular association might be pushing issues not aligned with the overall priorities for a country," says Dr Knaul. Working with a range of partners can also help to address the problem of unequal access to services. Panama's National Cancer Association was established in 1970 to support cancer patients, and has a broad network of 20 chapters and seven clinics which has helped to distribute services more widely. This includes programmes that reach the 33% of people living in rural areas in the country.

International partnerships, such as those established with world-leading institutions, can improve access to the latest evidence, data and technology. The introduction of international tumour boards, for instance, increases multidisciplinary discussion, and can increase the chances of indicating adequate therapies.[69] Such approaches have led to important gains in paediatric oncology by providing improved infrastructure, enhanced access to drugs and diagnostic tests, access to international experts, and the development of hospital-based, outcome-oriented information systems.[70] These outcome-based information systems can help to establish central cancer registries. For PBCRs specifically, designated collaborating centres are providing the platform to develop twinning programmes and specific roles for research institutions within countries.[6]

Field-based collaboration can also be aided by the latest communications technology. This can support the patient-physician relationship, for instance. Rates of mobile phone ownership across Latin America are rising, and free applications like WhatsApp can provide links with physicians for support or information provision. According to one source, WhatsApp reaches 66% of the population in Latin America, the highest ratio among all regions in the world.[71] Another study reported that over 75% of cancer patients in one Ecuadorian cancer centre used WhatsApp to communicate with physicians about care. Such high usage levels partly arise because many mobile phone providers in Latin America offer unlimited access to WhatsApp.[72] Along the same lines, tele-oncology—including diagnostics (laboratory, radiology and pathology), treatment, and supportive care (rehabilitation and palliative care)—can link centres of excellence with remote clinical locations for the dispersion of best practices.[73] For example, the Latin American Brain Tumour Board is a weekly teleconference connecting paediatric neuro-oncologists from referral centres in high-income countries with paediatric subspecialists in Latin America.[74, 75]

Misperceptions, bias and undue influence impede decision-making

Decision-support mechanisms can be undermined by external influences that impede rational choices, from patient decisions to policy "blind spots". Such challenges can lead to under-investment by governments. Any effort to support decision-making must involve actively tackling misperceptions,

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biases and undue influences. The private sector and providers alike, from insurers to companies and physicians, may suffer from biases and misperceptions. Beyond personal views on cancer treatment that may not be supported by evidence, examples include reluctance to contribute real-world data for reasons such as fear of revealing management errors or instances of over-treatment. In the absence of strong evidence, room is left for these factors to influence key decisions related to cancer care, which can increase inequities and inefficiencies in the system.

A more specific example of this involves the advocacy efforts of civil society groups. Civil society groups can help to improve transparency and policy momentum, but they may also lobby around certain cancers at the expense of others. For instance, in Latin America there is limited advocacy for cervical cancer in comparison to breast cancer, even though cervical cancer can be prevented through the HPV vaccination. Patients also fall victim to their own misperceptions—they may, for example, fail to take advantage of services to which they are entitled owing to stigma, fear or lack of awareness. Dr Soria mentions that a sizeable number of women do not utilise free provisions such as Pap tests and radiotherapy in Bolivia for these reasons.

Government misperceptions should also be tackled, not least those behind the underinvestment in cancer control. Although spending is not the sole determinant of care quality, health spending in Latin America is low relative to GDP compared with that of developed nations.[5] In South America specifically, cancer care represented 0.125% of gross national income per capita (ranging from 0.06% in Venezuela to 0.29% in Uruguay) in 2009; this compared with 0.51% in the UK, 0.6% in Japan and 1.02% in the US.[5]

Politicians may prioritise funds to more voter-salient, short-term ends, whereas the benefits in cancer control, such as treatment costs saved thanks to prevention, play out over the long term. "If you are a politician and you want votes, you build houses, improve the macro- and micro-economy; you direct actions to teachers, education, security and the police; you build bridges, houses and roads. That's what gets you the votes," says Mr Paonessa. Policymakers have also been reluctant to support unpopular reforms such as tobacco taxes. When political figures understand cancer and its cost, action follows; it is no coincidence that Uruguay's above-average cancer control performance has coincided with the presidency of Tabaré Vázquez, a trained oncologist.

Ultimately, employing mechanisms to improve the quality and coverage of data, drive effective assessment of data, and successfully integrate evidence-driven decisions into standards of cancer care creates the capacity to optimise the limited resources available for cancer care throughout the region. However, doing this well within existing systems can be exceedingly complex, and requires strong understanding of the wider contextual factors that both enable and resist progress.

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Chapter 5: The regional decision-making landscape

Regionally, countries in Latin America vary in terms of their decision-making environment for cancer care (see Figure 5). According to EIU analysis, Brazil has the highest rating ("moderately strong"), owing to the existence of a centralised health data source for the public sector, the most developed HTA and assessment infrastructure among study countries, and a central agency that co-ordinates cancer control across the country. However, although Brazil has more infrastructure in place to enable the optimisation of cancer care, constraints such as budget capitation, lack of transparency around HTA processes, high rates of judicialisation, and limited registry data mean that improvements can be made.

Figure 5. Decision-making environments for optimisation of cancer care.

Source: The Economist Intelligence Unit.

Chile, Colombia and Mexico are rated as "moderate". While systems and infrastructure around each node are slightly less developed in the three countries, each has unique strengths specific to its context. Chile, for example, has a strong health systems research network and co-ordinated coverage for cancer care through its healthcare system. In Colombia, meanwhile, the Cuenta de Alto Costo, an non-governmental body of the social security system, provides a blueprint for targeted coverage of high-cost care in the region, including for cancer.

Argentina, Peru, Panama and Bolivia fall in the "moderately weak" or "weak" category. This means that they are developing infrastructure around each node in the face of significant barriers to progress, such as system fragmentation and competing priorities. For instance, Argentina's highly fragmented system and waning priortisation of health in the midst of ongoing economic challenges creates barriers for cancer care provision. Meanwhile, Bolivia is still developing systems and capabilities to provide an accurate picture of the basic measures of cancer care burden in the country. Appendix 2 provides an in-depth look into each country's decision-making environment.

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When evaluating findings in terms of each of the three decision nodes, there are both bright spots and notable challenges facing the region (see Table 2). For instance, the emergence of educational programmes to boost an informed workforce, along with an increasing recognition of the value of cancer control plans, has led to traceable improvement in the region. However, system fragmentation (both physical and among information systems) creates major barriers to implementation of such initiatives.

Table 2. Overview of enablers and resisters to evidence-based decision-making for cancer care in Latin America.

	Enablers	Resistors
Robust data	**Data sources:** Prioritisation of quality improvement and expansion of population-based cancer registries, electronic health records and other sources of quality health data to inform more strategic decisions	**Data sources:** Limited information in terms of real world evidence causes decisions to be made from "10,000 feet away", and make it challenging to hold decision-makers accountable
	Research: Strong health services research and public health workforce in the region can be better integrated into decision-making processes	**Research:** Research agenda often dictated by foreign donors which makes it difficult to focus on regional priorities
Effective assessment	**Health technology assessment infrastructure:** Growing regional collaboration for health technology assessments and other forms of assessment through RedETSA, ICES, LatAm HTAi Policy Forum, etc.	**Judicialisation:** In countries with rights to health, courts frequently do not consider cost-effectiveness analyses, health technology assessments or resource allocation assessments already conducted in decisions
	Workforce capacity: Emergence of educational programs and curriculum in medical training for health technology assessments, pharmacoeconomics, economic evaluations, etc.	**Segmentation:** Disparate agencies and bodies cause confusion and delay in health technology assessments and other assessments, with some agencies lacking independence
Integration into care	**Planning:** National cancer control plans largely in effect or being developed, with building recognition of their value	**Influences:** Conflicting interests, misperceptions, and fragmentation influence decision processes, particularly in the absence of accessible, high-quality data
	Localisation: Growing recognition of the importance of localised cancer guidelines	**Fragmentation:** Complex bureaucracy and regulation caused by fragmented health systems
	Collaboration: Stronger inter-institutional and regional multi-stakeholder collaboration across the region to solve common challenges	**Equity:** Centralisation of cancer resources in large urban areas creating access issues for rural population

Many of these resistors stem from a lack of reliable data, which, in turn, compromises effective assessment and the ability to integrate effective decisions into care. Improving infrastructure and developing processes across these areas can enable countries to address influences from parties with interests that are not aligned to high-quality care. In addition, they can guide more effective use of resources for health, and for cancer care specifically, that already exist.

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Conclusion: The way ahead

Cancer incidence naturally increases as populations age and lifestyles change, notably in relation to diet and exercise. But the relationship between cancer incidence and mortality shows sizeable variation across regions and countries, which does not simply mirror demographic dynamics or the level of financial resources dedicated to cancer management. Cancer control and the many choices that go into its design and implementation—whether made by governments, pharmaceutical and technology companies, insurers, hospitals or civil society—play a vital role in determining the survival and wellbeing of patients.

Without bold shifts in the way things are done, Latin American countries will see a rise in cancer incidence in the near future, with an incidence-to-mortality ratio notably higher than seen in other regions. Optimising cancer management and control can prepare the region to meet this approaching challenge and offer its citizens the best chance of avoiding or surviving the disease. This report, informed by expert interviews and evidence-driven landscape analyses, has identified the core elements to be addressed when optimising cancer care in Latin America, as well as paths toward improving these elements.

Invest in data systems—and the people who need to use them

We live in an era of unprecedented data generation and use, and this is transforming healthcare outcomes across the world. Health-specific uses of data and technology range from AI-assisted diagnosis and treatment, to electronic health records that co-ordinate care pathways and reduce errors and gaps. Cancer management choices need to be based on the right data. For data use to actively yield sound policy decisions, from planning services around epidemiology to making economic impact assessments, Latin American countries can improve their collection and use of data through several channels:

- Strengthening the quality and coverage of PBCR data and investing in harmonisation of the structure and content.
- Creating appropriate incentives for data-sharing throughout the healthcare ecosystem, from sub-national administrative bodies to pharmacies and companies.
- Developing comprehensive, inclusive cancer control plans and ensuring that they are "live" documents that evolve in response to shifting disease management dynamics. These can build upon past national efforts in areas like HPV vaccination to mobilise health systems to shape cancer outcomes.
- Performing comprehensive needs assessments using high-quality data to assess resource allocation and address gaps.
- Improving data skills in the workforce to ensure that personnel understand and can use diverse data sets.

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- Improving the accessibility of cancer care data and guidelines for patients, including the development of stronger self-care guidelines and material aiming to boost health literacy.

Develop structured, rigorous approaches to put data to use—and avoid short-term thinking

Data must be incorporated into decisions in a structured way. Latin American countries are already adopting institutions like HTAs, but these are not ubiquitous enough, and where they do exist they can be narrow in focus. Countries can also work to harness the power of clinical guidelines and protocols to ensure that best practices are embedded into the cancer care system. A variety of approaches will ensure the structured incorporation of evidence into decision-making:

- Expanding the role and remit of HTAs to accommodate emerging therapies; build capacity among stakeholders—including health managers and the public health and clinical workforce—to understand and use them.
- Exploring mechanisms that include HTA-type analysis to drive both appropriate disinvestment and new coverage choices.
- Tackling service fragmentation that undermines the application of assessment findings and recommendations.
- Developing localised, evidence-based clinical guidelines and protocols to ensure that best practices are taken into the system and embedded into workflows.
- Employing robust monitoring of cancer control plan implementation, including efforts to co-ordinate and align across key stakeholder groups, better allocate resources across treatment modalities and focus on providing equitable care across populations.
- Identifying biases and misperceptions in various stakeholder groups that could lead to best practices being ignored or selectively applied.

Formalise processes and structures to facilitate collaboration

Cancer management requires a culture of collaboration and exchange between all societal actors, including health ministries, other areas of government, the private sector, NGOs and international agencies. Where cancer control is inclusive of these stakeholders, the resulting strategies benefit from diverse viewpoints and insights, and are more resilient to competing influences or a lack of balance (such as exclusion of the palliative care community). Collaboration can itself deliver dividends for resource and information sharing. Strategies to strengthen collaboration include:

- Developing formal mechanisms, requirements and incentives to incorporate partnerships between academic research communities and government.
- Supporting vibrant NGOs and civil society communities to address low health literacy, stigma and prevention.
- Deepening international engagement. Twinning with global centres of excellence can improve the spread of best practices and align local care with top international standards.

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In a bid to support more effective decision-making and improve cancer outcomes, Latin American countries have the opportunity to build collaborations within their own domestic stakeholder communities and with each other. Of course, multiple challenges complicate the region's efforts to adequately address its current and future cancer burden. But there are many ways that countries can position themselves to more strategically use the resources available to them. As this report shows, Latin American countries can develop approaches that will enable them to improve outcomes and, ultimately, more effectively meet the needs of people in the region who are affected by cancer.

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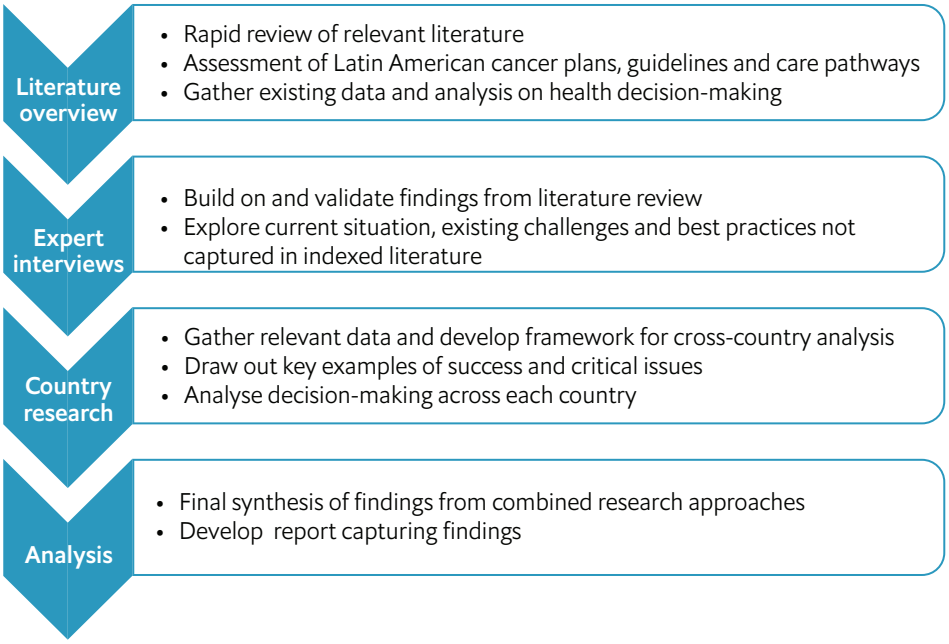
APPENDIX 1 METHODS

Our primary aim with this research programme was to explore the multi-faceted and nuanced topic of decision-making as it relates to cancer care across the Latin American region, and in eight specific countries of focus: Argentina, Bolivia, Brazil, Chile, Colombia, Mexico, Panama and Peru.

The EIU's approach to achieve this aim is comprised of the following components:

Figure A1. Overview of research methods.



In concert with interviews of leading researchers, clinicians, policy makers, and other stakeholders in the field, we performed a structured literature search based around factors related to the epidemiological, policy, clinical and economic environment around cancer care in the region. We limited our search to studies and sources published in the past ten years, prioritising sources from the past five. We did this to account for the changing nature of new policy guidelines at the national and international level, and critical advancements in cancer care that have changed the landscape in this period of time.

Our initial searching yielded more than 1600 papers, from which we analysed more than 200 at the title and abstract level. Approximately 60 papers underwent full-text review. Subsequently, we performed supplemental searching around key themes that arose from the initial literature review, including judicialisation, workforce development, national cancer control plans and guidelines and registries, to name a few. To further explore key gaps and questions, and add to the narrative richness of existing data, we conducted 15 expert interviews with researchers, clinicians, advocates and other stakeholders who provided key insights at both the country and regional level throughout the region.

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Country-level analysis

In order to reflect the wide diversity of the Latin American region, we employed an adapted technique to evaluate the influences on decision-making across each study country based on Kurt Lewin's force field analysis, developed in the 1950s. This allows for broader incorporation of forces that may not be readily comparable across each country, as well as supporting conclusions about the overall environment for key goals—in this case, the decision-making environment for optimisation of cancer care.

The first step in this analysis included identifying the most relevant forces specific to each country. To do this, our analysts triangulated primary and secondary data to identify key forces for each country. The identified forces were finalised through a consensus process, with a third analyst choosing when disagreement occurred.

We then developed a scale to assess the impact of each force, supported by judgements found in the research phase of this study (see Table A1).

Table A1. Scoring criteria for country-level analysis.

	Enabling Forces for Decision-Making to Optimise Cancer Care	Resisting Forces for Decision-Making to Optimise Cancer Care
1 Weak impact	Force has little impact on ability to make decisions	Force exists but has little impact on ability to make decisions or can be easily eliminated
2 Some impact	Force may have some impact, but is still developing, is not widely utilised or implemented, or only certain groups may take it into consideration	Force poses some resistance to effective decision-making, but can be eliminated with planning and resources
3 Considerable impact	Evidence of consideration of the force in key decision-making processes, but are not incentivised to be used or followed	Force poses considerable resistance to effective decision-making, but impact can be minimised with extensive planning and resources
4 Strong impact	Force is a high-quality, generally accepted standard of practise and/or has high influence on decision-making	Force poses strong resistance to optimising cancer care and its impact may be difficult to minimise

We used the same consensus-based process to arrive at final scores. The scores were then averaged and analysed to produce rankings according to their the overall enabling environment for care optimisation.

A range of international and national sources were used for the data collection. The EIU team carried out both primary and secondary research to identify recent authoritative data to populate the information contained within this country profile. Judgments were made based on the best information available from the research using a consensus-based process among analysts. Because of the nature of scoring—wherein complex matters are collapsed into simple scores—we note that not all readers will agree with all scores.

Combined findings from our evidence review, interviews and analysis are captured throughout this report and the country profiles found in Appendix 2.

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Introduction

The EIU explored the cancer decision-making landscape across eight countries in Latin America, listed in Table A2.1. Through analysis and synthesis of primary and secondary evidence from each country, we identified some of the most influential forces affecting each country's unique decision-making environment as it relates to the optimisation of cancer care.

Across the region, we found variability both within and between income groups and interesting nuances that shape each country's decision-making environment (see Table A2). The range of scores reflects the variability that we found in each country's approach to cancer planning, including areas of prioritisation (and deprioritisation).

Table A2. Summary ranking of enabling environments for cancer care decision-making.

Country	Decision-making environment	Income group
Brazil	Moderately strong	Upper-middle income
Chile	Moderate	High-income
Mexico	Moderate	Upper-middle income
Colombia	Moderate	Upper-middle income
Argentina	Moderately weak	Upper-middle income
Peru	Moderately weak	Upper-middle income
Panama	Weak	High-income
Bolivia	Weak	Lower-middle income

It is important to note that the analysis of decision-making environments is not intended to evaluate cancer care performance; instead it assesses the enabling (and disabling) environment for making decisions at the policy level. It is meant to identify areas of success and best practice, uncover key opportunities to optimise existing resources and build greater capacity for cancer care. In the face of a rising cancer burden and an advancing demographic transition, this analysis highlights key aspects of decision-making at the policy level that can support more effective planning and action.

A note on our methods

A range of international and national sources were used for the data collection. The EIU team carried out both primary and secondary research to identify recent, authoritative data to populate the information contained within each country profile. Scoring judgments were made against a framework (see Appendix 1) based on the best information available from our research, using a consensus-based process among two analysts. Where disagreement occurred, a third analyst informed final conclusions. Because of the nature of scoring—wherein complex matters are collapsed into simple scores—we note that not all readers will agree with all scores. A full description of our methodology and scoring criteria can be found in Appendix 1.

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ARGENTINA

DECISION-MAKING TO OPTIMISE CANCER CARE

With significant fragmentation across the health system and relatively recent development of formalised assessment mechanisms for decision-making, Argentina has can build upon existing infrastructure to optimise cancer care. The analysis below assesses key forces that both enable and resist Argentina's efforts to address cancer. By focusing on strengthening enabling forces and reducing the impact of resisting forces, the country has an opportunity to improve the provision of cancer care.

Argentina's cancer care decision-making landscape

	Enabling forces (Strong 4 3 2 1 Weak)	Optimisation of cancer care	Resisting forces (Weak 1 2 3 4 Strong)	
Robust data	**Research:** Integrated framework for health systems research to generate cancer data		**Data quality:** Disparate data systems and variable collection create lack of quality data from PBCRs, economic evaluations, and other real-world data sources	Robust data
Effective assessment	**HTA:** Coordinated HTA activities through institutional network of 44 universities and hospitals with public outputs		**Use of evidence:** Disconnect between research community and decision-makers limits access to and understanding of the evidence base	
	Collaboration: Mechanisms for patient groups and NGOs to participate in decision-making (e.g. Liga Argentina de Lucha Contra el Cáncer)		**Cost:** Increased bureaucracy slows decision-making for high-cost treatment; no formal mechanisms for price negotiation	Effective assessment
Integration into care	**Coordination:** Coordinated national efforts for cancer screening and diagnosis		**Political will:** National deprioritisation of health (e.g. demotion of health ministry to secretariat) due to economic crisis, and no dedicated funding source for national cancer plan	Integration into care
	Leadership: INC provides centralised coordination for cancer control initiatives and new cancer control plan		**Workforce:** Insufficient workforce capacity and poor distribution of care creates access gaps	
	Equity/access: Mandatory medical program covers 100% of standard cancer therapy		**Fragmentation:** No mandate for 24 provincial health ministers to follow national policies or share data	

Cancer treatment

Screening/diagnostics	6 of 6 basic tests generally available[a]
Cancer medicines	87.5% of EML always available[b]
Oral morphine	Generally available in public system
Radiotherapy unit density (per 1 million)	2.8[c] (est. 51-75% coverage)[d]

Cancer workforce

Medical oncologists	400 (9.5 per 1 million)[e]
Radiation oncologists	176 (4.1 per 1 million)
Oncologists needed	645[f]
Surgeon density	*Data unavailable*
Palliative care physicians	100 (2.3 per 1 million)

Cancer burden[g]

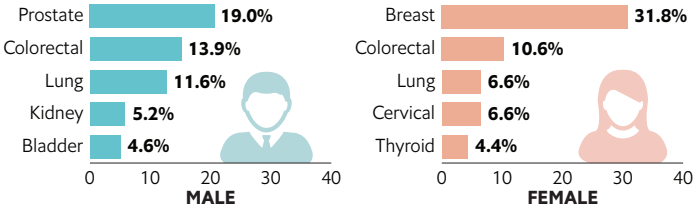
Incidence rate (per 100k): 218
Latin America: 190 ↑
UMI average: 302 ↓

Mortality-to-incidence ratio: 53%
Latin America: 48% ↑
UMI average: 51% ↑

Mortality rate (per 100k): 105
Latin America: 86.5 ↑
UMI average: 154 ↓

DALYs (per 100k): 3,745
Latin America: 2,521 ↑
UMI average: 3,783 ↓

Top 5 cancers by % of annual incidence



Country snapshot

Population
44.7 million

Population living in rural areas
8%

GDP per head (US$ at PPP)
US$21,720

Current health expenditure (CHE):
7.6% of GDP
UMI average: **5.9% of GDP**

Out-of-pocket spending (% CHE):
15.8%
UMI average: **35.5%**

Health spending per head:
US$955
UMI average: **US$455**

Health coverage:
76% UHC
Global average: **64%**

Total cost of new cancer cases: **US$489m**[h]
Cost per new case: **US$4,684**[i]

Data are from latest available published sources reviewed by the EIU. See page 42 for notes, definitions and acronyms.

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Argentina scores as **moderately weak** when it comes to the ability to optimise cancer care through effective decision-making. Although limited by fragmented data, ongoing austerity measures and a nascent health technology assessment (HTA) mechanism, Argentina's strong research infrastructure and coordination through the national cancer institute, or the Instituto Nacional del Cáncer de la Argentina (INC), provide notable opportunities for improvement. Boosting coordination among Argentina's segmented health system through these mechanisms should be one of the foremost priorities to achieve progress, especially in light of ongoing economic challenges that may lead to continued deprioritisation of health in the country.

Collecting and utilising robust data

Although Argentina has created a platform to unify various data sources to inform the cancer burden, the Sistema Integrado de Información Sanitaria Argentino, it has not yet been fully implemented.[1] This means that outputs from Argentina's data infrastructure, including that from the health statistics and surveillance databases (the Sistema Estadístico de Salud and the Sistema Nacional de Vigilancia de la Salud), health record data, cancer registry data, and other sources are limited by both volume and quality, preventing optimal decision-making. As such, data are typically extrapolated for resource allocation and other upstream decisions. Argentina self-reported having no population-based cancer registry in the WHO's 2017 Country Capacity Survey for non-communicable diseases as opposed to previous years, despite other sources estimating roughly 30% coverage, and about 10% of which is considered to be high-quality.[2,3] A relatively strong, integrated framework for health systems research is an important tool, as it is already organised to support research based on local needs through established partnerships with the science and technology sectors.[4]

Mechanisms for effective assessment of data, needs and resources

Argentina's infrastructure for effective assessment of data is relatively nascent, which accounts for the limited availability and access to health technology and economic evaluations among the oncology community. This means that up-front costs often become a primary data point (and barrier) to incorporating new technologies in Argentina, delaying decision-making, increasing bureaucracy and ultimately limiting access. The country has created a requirement to conduct HTAs for the introduction of new technologies into the health system, executed through a network of 44 universities and hospitals.[5] The country is currently working on developing Comisión Nacional de Evaluación de Tecnologías de Salud (CONETEC), the body responsible for coordinating these HTAs and issuing unified recommendations on the incorporation, use, financing and coverage of health technology, with outputs being public for all stakeholders. CONETEC, as well as other co-ordinating entities, is exceedingly important, as a current disconnect exists between the research community and decision-makers. In an effort to address judicialisation of cancer care and treatment for other conditions in the country, CONETEC can also serve as a consulting body in court cases.[6]

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Pathways for integration of evidence-based decision-making into care

INC serves as a central coordinating body in Argentina for the implementation of cancer control activities, and strives to ensure that cancer is a high priority on the government's agenda. INC's new national cancer control plan is an important development to further harmonise cancer efforts across the country. However, there is a lack of incentive for the country's 24 sub-national health ministers to follow INC's directives and guidelines, thus creating greater opportunity for influences from industry and divergent political priorities to affect decisions.[7] Developing new ways to align on priorities and incentivising collaboration is one way to limit the effects of this fragmentation. For example, participation of civil society in decision-making tends to vary widely in Argentina, but organisations like Liga Argentina de Lucha Contra el Cáncer play a distinct advisory role to health authorities. Similarly, CONETEC is developing a patient board as part of its activities.[8,9] In order to manage misperceptions and undue influences, particularly in light of notable data gaps around cancer and cancer care, Argentina can strengthen its mechanisms for multi-stakeholder participation in key decision-making processes.

The way forward

Although Argentina has some infrastructure in place for effective cancer care decision-making, it is critical that leaders consider pursuing activities such as the following to maximise data and sound mechanisms to assess it, and better integrate effective decisions within cancer care:

- Develop more formal mechanisms, requirements, and incentives to incorporate Argentina's active civil society, research community and other stakeholders in decision-making processes.
- Create stronger processes to integrate CONETEC's activities into the health system as the agency develops, including increasing awareness, dissemination and utilisation of outputs.
- Detach physical fragmentation of Argentina's health system from fragmentation of health information by creating incentives for sub-national administrative bodies to share data and best practices, particularly around indicators that can guide more strategic resource allocation.
- Strengthen capacity for leaders in Argentina's subsectors to access, understand, and utilise evidence such as economic evaluations and HTA outputs for decision-making.

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Notes and acronyms

a. Six basic screening tests include: cervical cytology (PAP), acetic acid visualisation (VIA), breast palpation/clinical breast exam, mammogram, faecal occult blood test or faecal immunology test, and bowel cancer screening by exam or colonoscopy
b. WHO Essential Medicines List contains 24 oncology drugs
c. International Atomic Energy Agency (IAEA) generally recommends four machines per 1 million residents
d. Coverage may be overestimated due to lack of data regarding machine age, condition and distribution
e. Equates to roughly 287 new cases per clinical oncologist
f. Based on IAEA recommendation of dual-trained medical and radiation oncologists
g. Arrows indicate Argentina's burden in comparison to regional and global income group averages
h. Total cost includes direct and indirect cost in 2009. More recent data was not available.
i. Per patient cost based on 2009 cancer incidence.

DALY – Disability-adjusted life year
EML – WHO Essential Medicines List
GDP – Gross domestic product
HTA – Health technology assessment
INC – Instituto Nacional del Cáncer de la Argentina
NGO – Non-governmental organisation
PBCR – Population-based cancer registry
PPP – Purchasing power parity
UHC – Universal health coverage
UMI – Upper-middle income

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BOLIVIA

DECISION-MAKING TO OPTIMISE CANCER CARE

As the only lower middle-income country in our study, Bolivia is in the earliest stages of developing an enabling environment for effective decision-making for cancer care. The analysis below assesses key forces that both enable and resist optimisation of cancer care in the country. By focusing on strengthening enabling forces and reducing the impact of resisting forces, Bolivia has an important opportunity to capitalise on recent efforts to develop the health system and make the most of limited resources.

Bolivia's cancer care decision-making landscape

	Enabling forces (Strong 4 3 2 1 Weak)	Optimisation of cancer care	Resisting forces (Weak 1 2 3 4 Strong)	
Robust data	**Collaboration:** Regional collaboration for information sharing and capacity building with PAHO and RINC support		**Data:** Little reliable epidemiological data, partially due to decentralisation of health administration and a nascent PBCR	Robust data
Effective assessment	**Education:** Provide curriculum on HTAs and economic evaluation in university medical programs		**Cost:** Reported misperceptions about new technologies and reliance on up-front cost as a key decision factor due to data gaps	Effective assessment
Effective assessment	**Advocacy:** Strong presence of professional societies and non-profits focused on access to treatment		**Competing priorities:** Limited budget to cover double burden of infectious and chronic diseases diminishes ability to prioritise cancer	Effective assessment
Effective assessment	**Assessment:** Legal framework for the evaluation of medical devices through 'Medical Devices Registration 24'		**Implementation capacity:** Emphasis on screening with minimal resources to deliver cancer control as described in national policies and high-level guidelines	Integration into care
Integration into care	**Political will:** Prioritisation of the health system through the 2018 creation of the unified health system and associated investments		**Fragmentation:** Decentralised health system in the nine provinces creates complex regulatory environment across federal and subnational authorities	Integration into care

Cancer treatment

Screening/diagnostics	3 of 6 basic tests generally available[a]
Cancer medicines	Generally available in public system
Oral morphine	Not generally available
Radiotherapy unit density (per 1 million)	0.6[b] (est. 26-50% coverage)[c]

Cancer workforce

Medical oncologists	*Data unavailable*
Radiation oncologists	11 (1 per 1 million)
Oncologists needed	75[d]
Surgeon density	0.2 per 1,000[e]
Palliative care physicians	*Data unavailable*

Cancer burden[f]

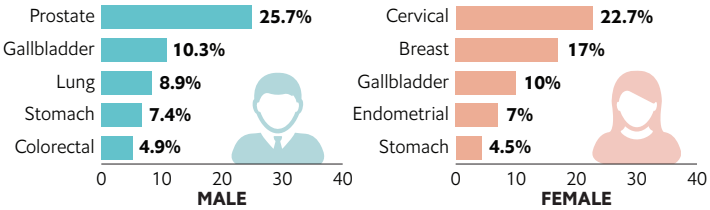
Incidence rate (per 100k): 143
Latin America: 190 ↓
LMI average: 108 ↑

Mortality rate (per 100k): 88
Latin America: 87 ↑
LMI average: 71 ↑

Mortality-to-incidence ratio: 64%
Latin America: 48% ↑
LMI average: 66% ↓

DALYs (per 100k): 2,689
Latin America: 2,521 ↑
LMI average: 2,071 ↑

Top five cancers by % of annual incidence



Country snapshot

Population
11.2 million

Population living in rural areas
13%

GDP per head (US$ at PPP)
US$7,890

Current health expenditure (CHE):
6.6% of GDP
LMI average: **4.0% of GDP**

Out-of-pocket spending (% CHE):
28%
LMI average: **56.2%**

Health spending per head:
US$213
LMI average: **US$79.4**

Health coverage:
60% UHC
Global: **64%**

Total cost of new cancer cases: **US$18m**[g]
Cost per new case: **US$1.140**[h]

Data are from latest available published sources reviewed by the EIU. See page 46 for notes, definitions and acronyms.

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Bolivia is still developing its capacity to support strong decision-making and optimisation of cancer care as it grows into its new national healthcare system, the Sistema Único de Salud (SUS). As such, the country currently scores as weak according to our analysis. However, although resource limitations and a number of competing priorities create significant barriers in the country, decision-makers and health sector leaders are showing progress on a number of fronts that may boost Bolivia's future abilities to better-understand and address its cancer burden.

Collecting and utilising robust data

Bolivia is facing a critical deficit of data that describes the situation of cancer in the country, as official incidence and mortality rates reported by the WHO are extrapolated from neighbouring countries.[1] Bolivia is continuing to develop its infrastructure through the national health information system, the Sistema Nacional de Informacion en Salud, and population-based cancer registries. However, although registry data covers nearly 40% of the population over a five-year time period, it is not considered to be of high-quality.[2] In the absence of this data, patient groups and oncology societies take a leading role in the country to advocate for access and needs.

Mechanisms for effective assessment of data, needs and resources

Bolivia currently has few official channels for effective assessment, although the Ministry of Health is a member of the regional health technology assessment (HTA) initiative, Red de Evaluación de Tecnologías en Salud de las Américas. Limited assessment is conducted to validate purchases of certain treatments.[3] As such, there is general awareness about the opportunity for influence of industry, misperception and opinion in decision-making in the country. To combat this, Bolivia is aiming to improve information and data sharing, including assessment data, through regional partnerships. Despite relatively underdeveloped infrastructure, Bolivia is one of the few countries that offers HTA and economic evaluation in medical education programmes, in an effort to bolster the clinical community's understanding and utilisation of sound evaluation as a basis for the provision of healthcare.

Pathways for integration of evidence-based decision-making into care

Less than a year ago, the Ministry of Health implemented a national programme for cancer control to coordinate efforts to fight the disease in conjunction with the development of the SUS. This programme is one mechanism that may help to overcome some of the challenges associated with competing priorities (i.e. relatively high burden of communicable diseases and other health challenges) and fragmentation in the country, including different regulations and priorities being pursued by leaders at the national, regional and local levels. In addition, the government promulgated a Cancer Law with aims to guarantee universal and comprehensive access to care across the care pathway, based on the country's epidemiological profile and health financing in September 2019. As efforts to improve data and mechanisms for assessment develop, it is critical for Bolivia to ensure that the clinical community is engaged in pathways for implementation of strategies that better optimise care.

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The way forward

Although Bolivia has a long road ahead to ensure the population has access to high quality cancer care, recent efforts have laid important groundwork to support more strategic decision-making and resource allocation in the country. Additional actions can help to support this forward momentum in Bolivia:

- Strengthen the national programme for cancer control to align efforts, priorities and approaches across regions and at the national level.
- Create better linkages between decision-makers and the medical community to create channels for effective decisions to be translated into standards of practise (i.e. localised care guidelines for all high-burden cancers).
- Strengthen a common understanding of cancer control developed by qualified experts, including consensus-building around decisions for treatment priorities, workforce development, etc.
- Build upon a legacy of national programmes (i.e. human papilloma virus vaccination) to improve coordination and confidence in addressing cancer control.
- Strengthen patient awareness programmes and care navigation aiming to boost utilisation of available services.

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Notes and acronyms

a. Six basic screening tests include: cervical cytology (PAP), acetic acid visualisation (VIA), breast palpation/clinical breast exam, mammogram, faecal occult blood test or faecal immunology test, and bowel cancer screening by exam or colonoscopy
b. International Atomic Energy Agency (IAEA) generally recommends four machines per 1 million residents
c. Coverage may be overestimated due to lack of data regarding machine age, condition and distribution
d. Based on IAEA recommendation of dual-trained medical and radiation oncologists
e. Overall surgeon density; data on oncological surgeons not available
f. Arrows indicate Bolivia's burden in comparison to regional and global income group averages
g. Total cost includes direct and indirect cost in 2009. More recent data was not available.
h. Per patient cost based on 2009 cancer incidence.

DALY – Disability-adjusted life year
GDP – Gross domestic product
HTA – Health technology assessment
LMI – Lower-middle income
PAHO – Pan American Health Organization
PBCR – Population-based cancer registry
PPP – Purchasing power parity
RINC – Network of National Institutes and Institutions of Cancer
UHC – Universal health coverage

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BRAZIL

DECISION-MAKING TO OPTIMISE CANCER CARE

With mechanisms in place to collect and assess data, and integrate evidence-based decision-making into care, Brazil has the strongest ability to optimise care resources among our study countries. The analysis below assesses key forces that both enable and resist optimisation of cancer care in the Brazilian context. By focusing on strengthening enabling forces and reducing the impact of resisting forces, Brazil has an important opportunity to improve the provision of cancer care and resulting outcomes.

Brazil's cancer care decision-making landscape

	Enabling forces (Strong 4 3 2 1 Weak)	Optimisation of cancer care	Resisting forces (Weak 1 2 3 4 Strong)	
Robust data	**Data:** Collection and maintenance of data through DATASUS and national health surveys (IBGE) provides some real-world data		**Data:** Variable quality of real-world evidence and limited coverage of high-quality PBCRs, in part due to private health system resistance to data sharing	Robust data
Effective assessment	**HTA:** Legally mandated and time-bound HTA process with national HTA network that disseminates HTAs		**Assessment:** HTA-based decisions depend on specialist opinion and cost considerations with no process to deal with uncertainty; impact of cost-effectiveness is reportedly low	Effective assessment
	Assessment: Use of holistic criteria for evaluation (i.e CEA, price, evidence, quality of life, etc.) for both investment and disinvestment		**Transparency:** No mechanism to negotiate price of medical devices or appeal HTA decisions	
	Infrastructure: Established regulatory process for pricing and cost-effectiveness of medicines; legal benchmark for oncology care		**Segmentation:** Transfer of cancer coordination from INCA to SUS health departments leads to less specialisation in management	Integration into care
Integration into care	**Implementation:** INCA facilitates and prioritises implementation infrastructure for the cancer control programme		**Financing:** Poor financing of cancer care through low investment limits capacity; 20-year public budget capitation in 2016 restricts access and increases judicialisation	
	Focus on equity and access: Mandatory right to healthcare prioritises equity and access		**Fragmentation:** Fragmentation of healthcare system leads to regulatory complexity and weak adherence to INCA guidelines	

Cancer treatment

Screening/diagnostics	5 of 6 basic tests generally available[a]
Cancer medicines	79.2% of EML always available[b]
Oral morphine	Generally available in public system
Radiotherapy unit density (per 1 million)	1.7[c] (est. 51-75% coverage)[d]

Cancer workforce

Medical oncologists	2,577 (12.8 per 1 million)[e]
Radiation oncologists	391 (1.9 per 1 million)
Oncologists needed	2,797[f]
Surgeon density	0.35 per 1,000[g]
Palliative care physicians	*Data unavailable*[h]

Cancer burden[f]

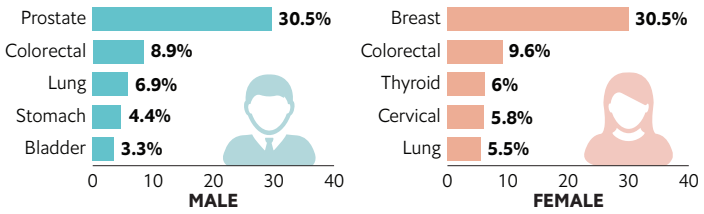
Incidence rate (per 100k): 217
Latin America: 190 ↑
UMI average: 302 ↓

Mortality rate (per 100k): 91
Latin America: 87 ↑
UMI average: 154 ↓

Mortality-to-incidence ratio: 44%
Latin America: 48% ↓
UMI average: 51% ↓

DALYs (per 100k): 2,900
Latin America: 2,521 ↑
UMI average: 3,783 ↓

Top five cancers by % of annual incidence



Country snapshot

Population
209.2 million

Population living in rural areas
13%

GDP per head (US$ at PPP)
US$15,950

Current health expenditure (CHE):
11.8% of GDP
UMI average: **5.9% of GDP**

Out-of-pocket spending (% CHE):
43.6%
UMI average: **35.5%**

Health spending per head:
US$1,016
UMI average: **US$455**

Health coverage:
77% UHC
Global: **64%**

Total cost of new cancer cases: **US$1.6bn**[j]
Cost per new case: **US$3289**[k]

Data are from latest available published sources reviewed by the EIU. See page 50 for notes, definitions and acronyms.

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Brazil presents the strongest environment for evidence-based decision-making and optimisation of cancer resources among our study countries, earning a moderately strong score. However, the country faces challenges in translating this into effective cancer care, despite spending nearly two times as much on health compared to the average upper-middle income country. The population faces disparities in access (particularly to high-cost and newer cancer treatments), high out-of-pocket spending and higher-than-average cancer incidence and mortality rates among the region. As the only country in the world of more than 100 million people with guaranteed access to healthcare, Brazil has important opportunities to make more effective use of resources for improved cancer care, and set an example for other countries in the region and beyond.[1]

Collecting and utilising robust data

Between Brazil's centralised health data source for the public sector, Departamento de Informática do Sistema Único de Saúde do Brasil, growing use of electronic health records in primary care, several national health surveys, and some registry data from hospital-based and regional population-based cancer registries, Brazil has a number of data sources to inform the current cancer landscape. Brazil also boasts the highest research and development budget of the study countries, although this is still low by international standards at 1.3% of GDP.[2] Unfortunately, many of these data sources are not interoperable, vary in terms of how indicators are collected and reported, and are considered insufficient in both volume and quality to adequately understand the cancer burden and prioritise effective ways to address it. Cancer advocacy groups and other stakeholders, such as Todos Juntos Contra o Câncer (TJCC) have attempted to fill some of these gaps, particularly around implementation and monitoring data through the development of tools such as the TJCC Radar.[3]

Mechanisms for effective assessment of data, needs and resources

Brazil is the only country in the region with a mandatory, time-bound national health technology assessment (HTA) system that includes holistic evaluation criteria for new treatments and technologies. Comissão Nacional de Incorporação de Tecnologias no SUS (CONITEC), the body responsible for HTAs, plays an important role in advising the Ministry of Health on new technologies and the production or modification of clinical protocols and guidelines.[4] In 2016, the Ministry of Health published guidelines to support managers, manufacturers and researchers in evaluating technologies and approaches to investment and disinvestment. The national network for HTAs, Rede Brasileira de Avaliação de Tecnologias em Saúde, and the hospital-based HTA system, Núcleo de Avaliação de Tecnologias em Saúde, also incentivise research institutions and other partners to help conduct, disseminate, and utilise HTAs throughout the country.[5] However, a recent review of HTAs found variation in transparency and application of decisions, in part because of insufficient resources to perform them, as well as divergent priorities among specialist associations, patient advocacy groups, and policy makers. This has been addressed to a limited degree by the activation of a long-standing council, Conselho Consultivo do Instituto Nacional de Câncer (CONSINCA), across various stakeholder groups to create better consensus.[6]

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Pathways for integration of evidence-based decision-making into care

Poor distribution of current health resources, in addition to a 20-year capitation on public expenditures implemented in 2016, has significantly impacted Brazil's ability to meet the needs of cancer patients, and has resulted in a significant burden on the judicial system. Over a seven-year period, Ministry of Health expenditures on litigation increased 13-fold, reaching R$1.6bn in 2016.[7] Despite approximately 64% of cancer patients needing radiotherapy treatment in the country, recent data suggests that spending on radiotherapy is about nine times lower than that on chemotherapy, and is decreasing. This is likely to worsen the inadequate supply of radiotherapy in Brazil, particularly as an estimated 50% of current radiotherapy machines are due to become obsolete in the public system by 2021. Although the Ministry of Health is aiming to address this gap over the next decade through a programme called *RT2030*, partly inspired by policies defined by CONSINCA, budget capitation will be a significant barrier to progress (unless tax revenues significantly increase over this period). This creates a stronger imperative for leaders to be more strategic about resource allocation and to integrate these strategies into the national cancer control plan, guidelines, and other mechanisms. The National Cancer Institute, Instituto Nacional de Câncer (INCA), provides coordination for cancer control throughout the country, but recent efforts to decentralise cancer coordination to health departments, along with long-standing fragmentation of the health system, has impacted INCA's influence and adherence to its guidelines for screening, diagnosis, and treatment of various cancers.[8, 9]

The way forward

Brazil is a leader in the region when it comes to infrastructure for sound decision-making, but there are several steps that must be taken to put this into practice and improve cancer outcomes:

- Perform a comprehensive, independent and cancer-focussed needs assessment using high-quality data to assess resource allocation and address recognised gaps (i.e. radiotherapy, sub-optimal rural access, etc.).
- Strengthen quality and coverage of population-based cancer registry data, and explore novel pathways to incentivise real-world and clinical data-sharing across health systems.
- Create stronger role for INCA to provide specialised technical assistance and stronger coordination among health departments.
- Develop formalised mechanisms to monitor implementation efforts and care quality.
- Build capacity among various stakeholders (such as public health system managers, the public health and clinical workforce, etc.) to understand and utilise HTA, cost-effectiveness, and other data across the decision pathway to build a longer-term and more strategic infrastructure for the optimisation of cancer care.

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Notes and acronyms

a. Six basic screening tests include: cervical cytology (PAP), acetic acid visualisation (VIA), breast palpation/clinical breast exam, mammogram, faecal occult blood test or faecal immunology test, and bowel cancer screening by exam or colonoscopy
b. WHO Essential Medicines List contains 24 oncology drugs
c. International Atomic Energy Agency (IAEA) generally recommends four machines per 1 million residents
d. Coverage may be overestimated due to lack of data regarding machine age, condition and distribution
e. Equates to roughly 170 new cases per clinical oncologist
f. Based on IAEA recommendation of dual-trained medical and radiation oncologists
g. Overall surgeon density; data on oncological surgeons not available
h. Palliative care is not recognized as a clinical specialty in Brazil
i. Arrows indicate Brazil's burden in comparison to regional and global income group averages
j. Total cost includes direct and indirect cost in 2009. More recent data was not available.
k. Per patient cost based on 2009 cancer incidence.

CEA – Cost-effectiveness analysis
DALY – Disability-adjusted life year
DATASUS – Departamento de Informática do Sistema Único de Saúde do Brasil
EML – WHO Essential Medicines List
GDP – Gross domestic product
HTA – Health technology assessment
IBGE – Instituto Brasileiro de Geografia e Estatistica
INCA – Instituto Nacional de Câncer
PBCR – Population-based cancer registry
PPP – Purchasing power parity
SUS – Sistema Único de Saúde
UHC – Universal health coverage
UMI – Upper-middle income

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CHILE

DECISION-MAKING TO OPTIMISE CANCER CARE

Among our study countries, Chile has a relatively strong environment for decision-making to optimize care resources, particularly with activities associated with the continued implementation of the country's universal health plan. The analysis below assesses key forces that both enable and resist optimisation of cancer care in Chile. By focusing on strengthening enabling forces and reducing the impact of resisting forces, Chile can support better resource use for cancer care and strengthen the effectiveness of the new cancer control plan.

Chile's cancer care decision-making landscape

	Enabling forces (Strong 4 3 2 1 Weak)	Resisting forces (Weak 1 2 3 4 Strong)	
Robust data	**Data:** Focus on improvement of PBCR and vital registration data, in addition to other sources	**Data:** Limited monitoring systems due to lacking coverage of high-quality PBCRs (<10%) and limited governance of EHR use	Robust data
Effective assessment	**Economic evaluation:** Budget impact analysis required for new health technologies; legally established guidelines for economic evaluation	**Systems:** Limited interoperability of data because of the variability of data collection and reporting methods	
Effective assessment	**Education:** Pharmacoeconomics diploma and HTA training programmes offered for workforce development	**Stakeholder interests:** Resistance to institutionalisation of HTAs due to perceived loss of power for politicians and technicians	Effective assessment
Effective assessment	**Collaboration:** Patients and societies can request HTAs through Law 20.850	**Assessment:** As of 2016, no mechanism for disinvestment of ineffective or outdated treatments	
Integration into care	**Planning:** Cancer control plan through 2028 provides key points of coordination for cancer care efforts	**Inequity:** Treatment centered in major cities leaves rural regions with notable deficits in care	Integration into care
Integration into care	**Access and equity:** Comprehensive prevention and cancer coverage for top 10 cancers through AUGE, with recent addition of breast and lung cancer	**Financing and capacity:** Budget capitation limits treatment availability; inadequate resource availability diminishes capacity to provide legally guaranteed services	

Optimisation of cancer care

Cancer treatment

Screening/diagnostics	5 of 6 basic tests generally available[a]
Cancer medicines	66.6% of EML always available[b]
Oral morphine	Generally available
Radiotherapy unit density (per 1 million)	0.9[c] (est. 101% coverage)[d]

Cancer workforce

Medical oncologists	60 (3.4 per 1 million)[e]
Radiation oncologists	55 (3.1 per 1 million)
Oncologists needed	267[f]
Surgeon density	0.41 per 1,000[g]
Palliative care physicians	70 (3.9 per 1 million)

Cancer burden[f]

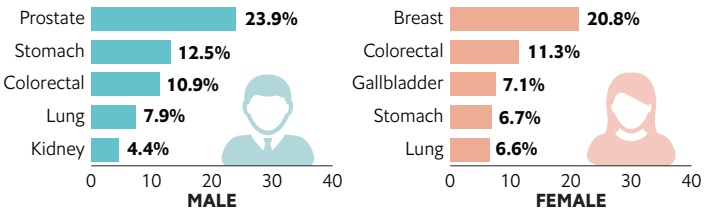
Incidence rate (per 100k): 196
Latin America: 190 ↑
HI average: 1,045 ↓

Mortality-to-incidence ratio: 53%
Latin America: 48% ↑
HI average: 23% ↑

Mortality rate (per 100k): 96
Latin America: 87 ↑
HI average: 242 ↓

DALYs (per 100k): 3,536
Latin America: 2,521 ↑
HI average: 4,741 ↓

Top five cancers by % of annual incidence



Country snapshot

Population
18.2 million

Population living in rural areas
12%

GDP per head (US$ at PPP)
US$26,195

Current health expenditure (CHE):
8.5% of GDP
HI average: **12.6% of GDP**

Out-of-pocket spending (% CHE):
35%
HI average: **14%**

Health spending per head:
US$1,191
HI average: **US$5,180**

Health coverage:
70% UHC
Global: **64%**

Total cost of new cancer cases: **US$256m**[i]
Cost per new case: **US$6,463**[j]

Data are from latest available published sources reviewed by the EIU. See page 54 for notes, definitions and acronyms.

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Chile has made important strides in improving cancer care in recent years, particularly with the continued development of Acceso Universal con Garantías Explícitas (AUGE), the country's universal health plan, and advanced radiotherapy coverage and palliative care, in comparison with other countries in the region. However, Chile is scored as moderate in this analysis, as there remain serious inequities in access, workforce challenges and barriers to providing newer therapies. And critically, data on the quality, delivery and functionality of existing treatments and resources is lacking throughout the country, impacting the ability to make effective decisions that drive good care.

Collecting and utilising robust data

Chile's ongoing efforts to fill critical funding gaps in cancer care have not only improved access, but have also led to an increase in scientific productivity in the country, including publications, patents and the growth of a skilled and informed workforce.[1] A diploma programme in Pharmacoeconomics and Health Technology Assessment is the first of its kind in the region, and aims to support the development of a workforce that is able to generate and integrate meaningful evidence for decision-making.[2] Chile's recent national cancer control plan (2018-28) includes a mandate to build a national cancer registry strategy to consolidate current population-based and hospital-based cancer registries. However, Santiago, the country's most populous city with over 40% of Chile's population, lacks coverage, and there are no immediate plans to monitor cancer incidence. There is a burgeoning research community in Chile, but it is largely limited to the private sector and academia. This means that there are some gaps when it comes to the generation and accessibility of local data and evidence for decision-makers and clinicians, and there is little accessible information available to the general public. Chile does have a national electronic health record system, and the unique advantage of Rol Único Tributario numbers, or unique identifiers assigned to each citizen at birth.[3] While these present important opportunities to contribute to real-world evidence, the lack of legislation governing the use of the electronic health records, particularly beyond primary care, is limiting.

Mechanisms for effective assessment of data, needs and resources

Chile, along with Peru and Argentina, is still in the early stages of formal health technology assessment (HTA) development, despite long-standing recognition of its importance in the country. A dedicated HTA body, División de Planificación Sanitaria (DIPLAS), was established in 2016 within the Ministry of Health, and government agencies within Chile are also members of Red de Evaluación de Tecnologías en Salud de las Américas, the regional HTA initiative.[4] There are barriers to the institutionalisation of HTAs in Chile, such as resistance from technicians and politicians due to fear of loss of decision-making power. As such, although Chile has partially developed HTA infrastructure, it is not yet required by law.[5] In some cases, medical societies are invited to bid for evaluations of new technologies, but there is no defined scope or resource allocation specifically dedicated to assessment of care, and there are no permanent models that require decision-makers to rely on this evidence base. There is also no mechanism for disinvestment of ineffective or outdated treatments. Despite some mechanisms for decision-making in place, leaders still experience influence from competing economic pressures, political agendas and citizen pressures that many not always align to outcomes-focussed objectives.

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Pathways for integration of evidence-based decision-making into care

Chile's AUGE programme assures access, quality and financial protection for 15 health conditions linked to cancer, including three introduced in 2019 (renal, thyroid and lung).[6] To enforce this, the programme has developed requirements and incentives for adherence to evidence-based standards of care, and has dedicated resources to regularly updating them. In addition, the Ricarte Soto Law addresses coverage of high-cost drugs, some of which are for oncological conditions.[7] Although universal coverage is yet to be realised in Chile, these two policy efforts have yielded both qualitative and quantitative improvements in the population's access to the diagnosis and treatment of cancer. Chile still suffers from high rates of judicialisation (consuming approximately 70% of all legislative resources in the country), which may improve with better coverage.[8] Chile's cancer control plan is wide-reaching, and aims to prioritise a territorial approach. This plan is particularly important to bridge gaps between primary, secondary and tertiary care – patients diagnosed in primary care can get lost in the system and experience delays or inefficient use of resources in the transition from treatment to diagnosis. In addition, a relatively low supply of oncologists and limited treatment availability among chemotherapy, radiotherapy, and surgery worsen this effect. For instance, while radiotherapy coverage is estimated at 101%, resources are heavily centralised in urban population centres; furthermore, the International Atomic Energy Association reports radiotherapy machines in use in the country that are more than 40 years old.[9] Chile does have one of the most successful palliative care programmes in the region, ranking highest in the Quality of Death Index.[10]

The way forward

Chile's development of the AUGE programme, implementation of a new cancer control plan, and other developments put the country on a strong path toward being able to better-optimise cancer care. However, additional measures can be taken to improve the cancer care landscape:

- Develop strong mechanisms and explicit timelines to implement and monitor Chile's 2018-2028 national cancer control plan.
- Develop capacity to collect advanced data that allows for a more proactive approach to cancer control, including risk factors and social determinants, to strengthen promotion and prevention.
- Strengthen accessibility of cancer care data and guidelines for stakeholders.
- Boost coordination between primary, secondary and tertiary care to ensure that care is provided at the proper level, with the right expertise, and the right resources throughout the country (not only in densely populated regions).

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Notes and acronyms

a. Six basic screening tests include: cervical cytology (PAP), acetic acid visualisation (VIA), breast palpation/clinical breast exam, mammogram, faecal occult blood test or faecal immunology test, and bowel cancer screening by exam or colonoscopy
b. WHO Essential Medicines List contains 24 oncology drugs
c. International Atomic Energy Agency (IAEA) generally recommends four machines per 1 million residents
d. Coverage may be overestimated due to lack of data regarding machine age, condition and distribution
e. Equates to roughly 667 new cases per clinical oncologist
f. Based on IAEA recommendation of dual-trained medical and radiation oncologists
g. Overall surgeon density; data on oncological surgeons not available
h. Arrows indicate Chile's burden in comparison to regional and global income group averages
i. Total cost includes direct and indirect cost in 2009. More recent data was not available.
j. Per patient cost based on 2009 cancer incidence.

AUGE – Acceso Universal con Garantías Explícitas
DALY – Disability-adjusted life year
EHR – Electronic health record
EML – WHO Essential Medicines List
GDP – Gross domestic product
HI – High income
HTA – Health technology assessment
PBCR – Population-based cancer registry
PPP – Purchasing power parity
UHC – Universal health coverage

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COLOMBIA

DECISION-MAKING TO OPTIMISE CANCER CARE

Among our study countries, Colombia ranks near the top in terms of its environment for decision-making. The analysis below assesses key forces that both enable and resist optimisation of cancer care in the country. By focusing on strengthening enabling forces and reducing the impact of resisting forces, Colombia can support better optimisation of its cancer care efforts.

Colombia's cancer care decision-making landscape

	Enabling forces (Strong 4 3 2 1 Weak)	Optimisation of cancer care	Resisting forces (Weak 1 2 3 4 Strong)	
Robust data	**Data:** Some high-quality, longitudinal PBCR and vital registration data, along with the Observatory on Cancer and SISPRO, inform cancer care		**Data:** Quality improvement and standardisation needed across all systems due to low coverage of high-quality registry and other data (12% of the population)	Robust data
Robust data	**Infrastructure:** High-cost disease fund Cuenta de Alto Costo (CAC) targets effective data, assessment, and consideration for diseases like cancer		**Assessment capacity:** Inefficient and inequitable resource allocation attributed to restricted capacity to conduct HTAs and other assessments	Effective assessment
Effective assessment	**Assessment mechanisms:** Mandated processes for HTA, cost/benefit, and budget impact analysis through IETS and INVIMA		**Disinvestment:** No mechanism for disinvestment of ineffective or outdated treatments	Effective assessment
Effective assessment	**Collaboration/transparency:** Process for updating mandatory treatment list must be public and consult government and NGO entities		**Guidelines:** Care guidelines can be insensitive to the local context because of prioritised American and European guideline use	Integration into care
Integration into care	**Innovation and political will:** Prioritisation of innovative treatments and new technologies (e.g. biomarker studies)		**Fragmentation:** Variety of providers and insurers creates complexity and bureaucracy for treatment and coverage - limits capacity to deliver guaranteed treatment	Integration into care
Integration into care	**Access and quality focus:** Nearly full health coverage of the population with public private collaboration through 2015 Statutory Health Law; focus on pay-for-performance models		**Finance:** Financial deficits of health system due to high debts and mandate to treat; high rates of judicialisation affect equity and access	Integration into care

Cancer treatment

Screening/diagnostics	6 of 6 basic tests generally available[a]
Cancer medicines	12.5% of EML always available[b]
Oral morphine	Generally available
Radiotherapy unit density (per 1 million)	1.4[c] (est. 51-75% coverage)[d]

Cancer workforce

Medical oncologists	*Data unavailable*
Radiation oncologists	87 (1.9 per 1 million)
Oncologists needed	270[e]
Surgeon density	0.06 per 1,000[f]
Palliative care physicians	43 (0.9 per 1 million)

Cancer burden[f]

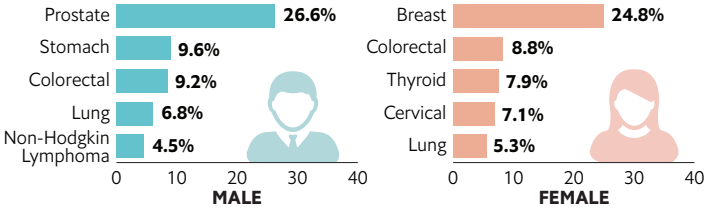
Incidence rate (per 100k): 176
Latin America: 190 ↓
UMI average: 302 ↓

Mortality rate (per 100k): 73
Latin America: 87 ↓
UMI average: 154 ↓

Mortality-to-incidence ratio: 43%
Latin America: 48% ↓
UMI average: 51% ↓

DALYs (per 100k): 2,268
Latin America: 2,521 ↓
UMI average: 3,783 ↓

Top five cancers by % of annual incidence



Country snapshot

Population
49.5 million

Population living in rural areas
19%

GDP per head (PPP)
US$14,890

Current health expenditure:
5.9% of GDP
UMI average: **5.9% of GDP**

Out-of-pocket spending (% CHE):
20.2%
UMI average: **35.5%**

Health spending per head:
US$340
UMI average: **US$455**

Health coverage:
76% UHC
Global: **64%**

Total cost of new cancer cases: **US$272m**[h]
Cost per new case: **US$3,045**[i]

Data are from latest available published sources reviewed by the EIU. See page 58 for notes, definitions and acronyms.

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Colombia presents a moderate environment for decision-making among our study countries, with concerted efforts to address diseases like cancer with strategic planning and several different sources of data. However, the growing burden of the disease, particularly in urban areas, will require progress in a number of areas to ensure that the country can boost access and equity to adequately address it.

Collecting and utilising robust data

Colombia has a unique advantage with a health system that covers nearly all people living in the country. This system has developed over the past 30 years, relying heavily on the private sector to fill critical care gaps (90% of oncology services in Colombia are private).[1] However, the country has learned the hard way when it comes to the importance of representative data – the system is facing critical economic challenges, due in part to a non-representative population being used to design the system. Multiple entities collect data in the country, including the national statistics department (Departamento Administrativo Nacional de Estadística), and the national public health surveillance system (Sistema de Vigilancia en Salud Pública). The population-based cancer registry in Cali is the longest-running in the region – although not considered high-quality, this registry contains more than 50 years of cancer data, and is joined with four other registries in the Colombian Observatory on Cancer. Colombia's high cost account, or Cuenta de Alto Costo, serves as a blueprint for the region, providing targeted attention, technical assistance, guidelines, funding, best practise-sharing and its own data registry for management of high-cost diseases like cancer.[2] The Sistema Integrado de Información de la Protección Social (SISPRO) database aims to harmonise these and other sources, including information on the health system such as supply and demand, quality, insurance, finance and social protection. Although all of these sources provide important insights for care in the country, improvement of both the quality and coverage is critical to inform more strategic cancer policy. In 2016, the country proposed Resolución 256 which aimed to introduce efforts to standardise information. In 2019, the Congress started a discussion to implement electronic health records throughout the country.[3]

Mechanisms for effective assessment of data, needs and resources

Through targeted efforts to co-ordinate high-quality data collection that optimises care for high-cost diseases, Colombia's private institute for health technology assessments (HTAs), Instituto de Evaluación Tecnológica en Salud (IETS), is responsible for evaluating treatments through cost-benefit analysis and other means.[4] The IETS coordinates with the Ministry of Health and other bodies and stakeholders in the country, and produces its own guidelines for HTAs, economic evaluation, and budget-impact analysis, the latter of which is required for the integration of new treatments and technologies in the health system.[5, 6] All citizens are able to participate in HTA and clinical guideline teams.[7] The IETS also assesses the evidence in reports on effectiveness submitted by manufacturers. However, the IETS is reportedly understaffed, which limits its ability to conduct evaluations – efforts are underway to grow the workforce able to conduct these evaluations through independent HTA courses at universities in the country.[8] In addition, there is a local system of tutelage, or guardianship, where any patient can request a judiciary review of the care that they have been provided, as well as file for access to treatment. Every case must be reviewed by a judge, which can help to ensure access but also slows down care provision.

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Pathways for integration of evidence-based decision-making into care

Colombia recognises the importance of effective treatments, and has sought to improve access to monoclonal antibodies and utilise biomarker and mutation studies to better target care. Despite limitations on both access to treatment and staffing for chemotherapy, radiotherapy and surgery, the country has prioritised modern technologies and specialty training programmes to improve quality. There has been an effort to encourage oncologists to follow American or European health guidelines to try to normalise the care provided to patients, but this has proven insensitive to the local context and has contributed to instability in the economic health of the system. The health system is experiencing financial deficits due to high debts and the mandate to treat. Unlike other countries in the region, inequities tend to stem not from public or private care, but from whether a patient has insurance or a prepaid care arrangement, with significant challenges in access for those who do not. In 2010 alone it was estimated that 95,000 writs of health protection and litigations cost an estimated US$330m.[9]

The way forward

Colombia has shown noteworthy commitment to addressing cancer in the country through investments for both care planning and provision, earning a score of moderate in this analysis. However, the following efforts can be made to boost the decision-making environment for more effective care:

- Employ robust monitoring of the new cancer control plan, including efforts to coordinate and align across key stakeholder groups.
- Utilise data collected in SISPRO and other sources to perform a comprehensive assessment of resource access and distribution to address key care and workforce gaps.
- Develop formal programmes and other means to engage universities to address workforce shortages across cancer care
- Assess distribution of risk among stakeholders in the system, particularly for inpatient care, to improve economic sustainability.

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Notes and acronyms

a. Six basic screening tests include: cervical cytology (PAP), acetic acid visualisation (VIA), breast palpation/clinical breast exam, mammogram, faecal occult blood test or faecal immunology test, and bowel cancer screening by exam or colonoscopy
b. WHO Essential Medicines List contains 24 oncology drugs
c. International Atomic Energy Agency (IAEA) generally recommends four machines per 1 million residents
d. Coverage may be overestimated due to lack of data regarding machine age, condition and distribution
e. Based on IAEA recommendation of dual-trained medical and radiation oncologists
f. Overall surgeon density; data on oncological surgeons not available
g. Arrows indicate Colombia's burden in comparison to regional and global income group averages
h. Total cost includes direct and indirect cost in 2009. More recent data was not available.
i. Per patient cost based on 2009 cancer incidence.

CAC – Cuenta de Alto Costo
DALY – Disability-adjusted life year
EML – WHO Essential Medicines List
GDP – Gross domestic product
HTA – Health technology assessment
IETS – Instituto de Evaluación Tecnológica en Salud
INVIMA – Instituto Nacional de Vigilancia de Medicamentos y Alimentos
NGO – Non-governmental organisation
PBCR – Population-based cancer registry
PPP – Purchasing power parity
SISPRO – Sistema Integrado de Información de la Protección Social
UHC – Universal health coverage
UMI – Upper-middle income

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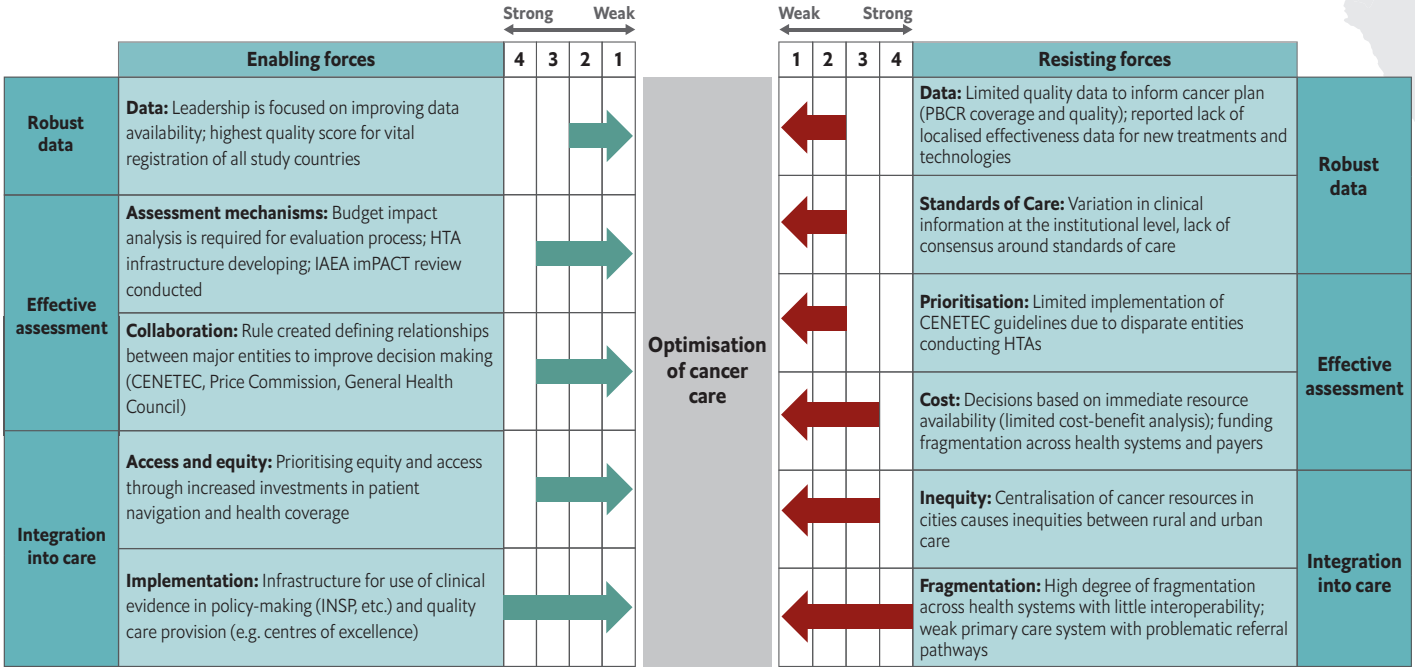
MEXICO

DECISION-MAKING TO OPTIMISE CANCER CARE

Mexico scores in the upper half of our study countries when it comes to the environment for decision-making to optimise care resources. The analysis below assesses key forces that both enable and resist optimisation of cancer care in the country. By focusing on strengthening enabling forces and reducing the impact of resisting forces, Mexico can support better co-ordination and more effective care provision at the national level.

Mexico's cancer care decision-making landscape



Cancer treatment

Screening/diagnostics	3 of 6 basic tests generally available[a]
Cancer medicines	100% of EML always available[b]
Oral morphine	*Data Unavailable*
Radiotherapy unit density (per 1 million)	0.5[c] (est. 51-75% coverage)[d]

Cancer workforce

Medical oncologists	352 (2.7 per 1 million)[e]
Radiation oncologists	212 (1.8 per 1 million)
Oncologists needed	953[f]
Surgeon density	0.22 per 1,000[g]
Palliative care physicians	250 (2.1 per 1 million)

Cancer burden[f]

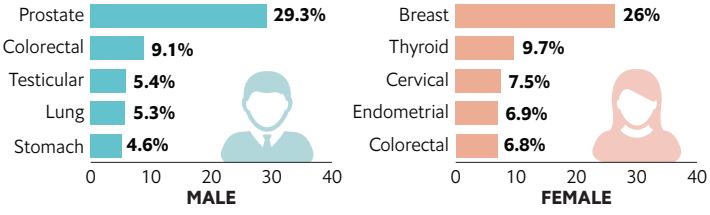
Incidence rate (per 100k): 143
Latin America: 190 ↓
UMI average: 302 ↓

Mortality rate (per 100k): 61
Latin America: 87 ↓
UMI average: 154 ↓

Mortality-to-incidence ratio: 44%
Latin America: 48% ↓
UMI average: 51% ↓

DALYs (per 100k): 2,039
Latin America: 2,521 ↓
UMI average: 3,783 ↓

Top five cancers by % of annual incidence



Country snapshot

Population
130.8 million

Population living in rural areas
20%

GDP per head (PPP)
US$19,280

Current health expenditure:
5.5% of GDP
UMI average: **5.9% of GDP**

Out-of-pocket spending (% CHE):
40.4%
UMI average: **35.5%**

Health spending per head:
US$462
UMI average: **US$455**

Health coverage:
76% UHC
Global: **64%**

Total cost of new cancer cases: **US$1.3b**[i]
Cost per new case: **US$4,395**[j]

Data are from latest available published sources reviewed by the EIU. See page 62 for notes, definitions and acronyms.

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Mexico is relatively well-positioned to make effective decisions that can optimise cancer care, owing to the new cancer control plan and ongoing efforts to strengthen data sources and assessment mechanisms. As such, it has a moderate environment for decision-making. Stronger use of these assets mean that Mexico will be able to address some of the most pressing barriers to quality care, which include a fragmented health system with delays in access, a lack of equity, and growing burden of cancer as obesity rates and other risk factors rise.

Collecting and utilising robust data

Mexico has the best quality vital registration data among the study countries, successfully utilises electronic health records, and has recently developed a population-based cancer registry.[1] Experts in the country hope that in five to seven years the registry will provide useful insights about cancer at both the regional and national level, including data on the timeliness of diagnosis, treatment, and other longitudinal factors. In the absence of this data, Mexico has, until recently, relied upon clinical case reports that varied across health institutions with little detail about the nature of the disease. The country has developed a simple pathology registry to fill these gaps for incidence data, but more emphasis is being placed on the need for robust data for decision-making. Mexico has legislation governing the use of electronic health records, and has the highest rates of use of these systems in tertiary centres among study countries.[2]

Mechanisms for effective assessment of data, needs and resources

Cost-benefit analysis is not regularly conducted in Mexico, leaving decisions to be made primarily on the basis of resources available. Mexico has a national health technology assessment agency, Centro Nacional de Excelencia Tecnológica en Salud, which has established guidelines for care. However, it typically sets these guidelines from international published literature, which may be insensitive to the Mexican context. Resources for cancer care in Mexico are often directed toward treatment based on diagnosed cases, versus a focus on screening and prevention. This contributes to a common trend of later diagnosis, more costly care, and poorer outcomes, particularly among those being treated in the public health system, Seguro Popular. Mexico requires budget-impact analysis for new technologies, and has informal references for economic evaluation.[3,4] A study looking at decision-making processes in the country showed that there are participatory processes for decision-making that include civil society.[5] Mexico, unlike several other countries in the region, also has mechanisms for disinvestment in treatments that are not effective or are outdated.[6]

Pathways for integration of evidence-based decision-making into care

Where Mexico, like other countries in the region, tends to struggle, is linking diagnosed patients to pathways for quality care.[7] This is due to highly centralised centres of excellence, with significant variation in care across different treatment centres. The government is aiming to design a unique healthcare system that better addresses these current gaps in care, and to create smoother referral pathways that are specific to the Mexican context. Mexico has a new, active national cancer control plan created by the national cancer institute, Instituto Nacional de Cancerología, which offers an opportunity to align cancer care throughout the country and across disparate health systems. In order to further the organisation of cancer control efforts, the government defined the relationship and roles of all major cancer entities in the country. [8] Mexico has a strong history of producing cancer guidelines, which are published and disseminated throughout the country.

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The way forward

Mexico is well positioned to develop key actions that will improve decision-making for more effective cancer care:

- Perform more robust monitoring of implementation of the national cancer control plan, guidelines, and other standards to reduce care variation.
- Strengthen primary care and referral pathways, and decentralise cancer resources in the country to ensure stronger access and equity across the country.
- Create roles for non-government organisations and other stakeholders to address low health literacy, stigma, and grow awareness around risk factors and effective prevention of cancer.
- Develop stronger inter-institutional and regional collaboration for information-sharing, aimed at limiting the influence of misperceptions and bias, and solving common challenges.
- Explore opportunities to increase collaboration among the public and private sectors to deliver high-quality care and maintain system sustainability.

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Notes and acronyms

a. Six basic screening tests include: cervical cytology (PAP), acetic acid visualisation (VIA), breast palpation/clinical breast exam, mammogram, faecal occult blood test or faecal immunology test, and bowel cancer screening by exam or colonoscopy
b. WHO Essential Medicines List contains 24 oncology drugs
c. International Atomic Energy Agency (IAEA) generally recommends four machines per 1 million residents
d. Coverage may be overestimated due to lack of data regarding machine age, condition and distribution
e. Equates to roughly 420 new cases per clinical oncologist
f. Based on IAEA recommendation of dual-trained medical and radiation oncologists
g. Overall surgeon density; data on oncological surgeons not available
h. Arrows indicate Mexico's burden in comparison to regional and global income group averages
i. Total cost includes direct and indirect cost in 2009. More recent data was not available.
j. Per patient cost based on 2009 cancer incidence.

CENETEC – Centro Nacional de Excelencia Tecnológica en Salud
DALY – Disability-adjusted life year
EML – WHO Essential Medicines List
GDP – Gross domestic product
HTA – Health technology assessment
IAEA – International Atomic Energy Agency
imPACT – integrated mission of Program of Action on Cancer Therapy
INSP – Instituto Nacional de Salud Pública
PBCR – Population-based cancer registry
PPP – Purchasing power parity
UHC – Universal health coverage
UMI – Upper-middle income

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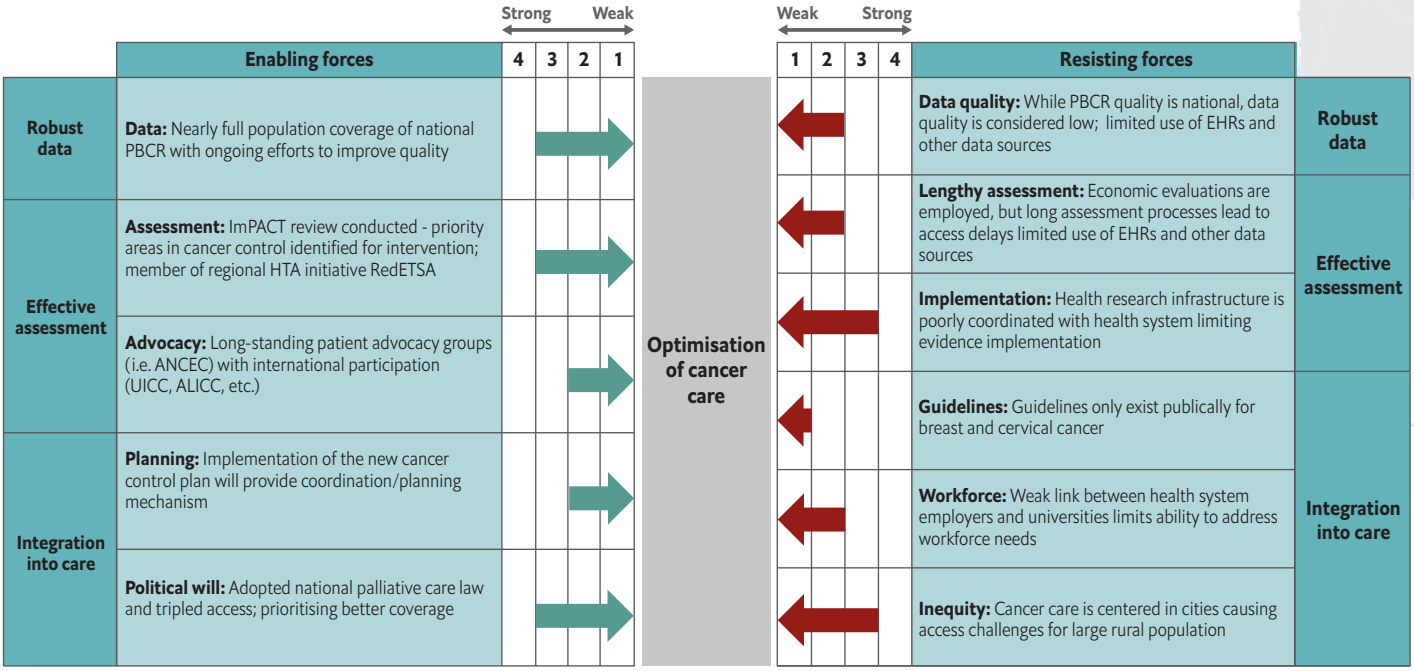
PANAMA

DECISION-MAKING TO OPTIMISE CANCER CARE

In terms of decision-making to optimise care resources, Panama ranks among the lowest of our study countries. The analysis below assesses key forces that both enable and resist optimisation of cancer care in the country. By focusing on strengthening enabling forces and reducing the impact of resisting forces, Panama can increase its capacity to provide more strategic and effective cancer care.

Panama's cancer care decision-making landscape



Cancer treatment

Screening/diagnostics	3 of 6 basic tests generally available[a]
Cancer medicines	Generally available[b]
Oral morphine	Not generally available
Radiotherapy unit density (per 1 million)	1.6[c] (est. 51-75% coverage)[d]

Cancer workforce

Medical oncologists	10 (2.6 per 1 million)[e]
Radiation oncologists	11 (2.8 per 1 million)
Oncologists needed	41[f]
Surgeon density	0.11 per 1,000[g]
Palliative care physicians	2 (0.5 per 1 million)

Cancer burden[f]

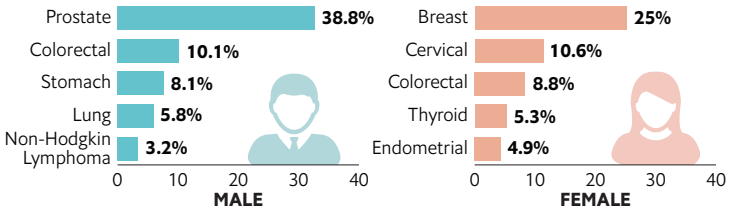
Incidence rate (per 100k): 173
Latin America: 190 ↓
HI average: 1,045 ↓

Mortality rate (per 100k): 77
Latin America: 87 ↓
HI average: 242 ↓

Mortality-to-incidence ratio: 46%
Latin America: 48% ↓
HI average: 23% ↑

DALYs (per 100k): 2,197
Latin America: 2,521 ↓
HI average: 4,714 ↓

Top five cancers by % of annual incidence



Country snapshot

Population
3.7 million

Population living in rural areas
32%

GDP per head (PPP)
US$25,330

Current health expenditure:
7.3% of GDP
HI average: **12.6% of GDP**

Out-of-pocket spending (% CHE):
27.4%
UMI average: **14%**

Health spending per head:
US$1,041
HI average: **US$5,180**

Health coverage:
75% UHC
Global: **64%**

Total cost of new cancer cases: **US$31.6m**[i]
Cost per new case: **US$5,840**[j]

Data are from latest available published sources reviewed by the EIU. See page 66 for notes, definitions and acronyms.

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In 2019, Panama's economic designation moved from upper-middle income to high-income, according to the World Bank. However, the country's mortality-to-incidence ratio is nearly double that of other high-income countries, and health system expenditures are roughly one-fifth of the average for countries in this income group. Therefore, it is perhaps unsurprising that Panama's environment for decision-making rates as weak according to our analysis. Better optimisation of cancer resources must be a key priority, particularly to ensure increased preparedness for growth in "lifestyle" cancers common in higher-income countries.

Collecting and utilising robust data

Panama is the only country in our study with a national population-based cancer registry, and efforts to improve data quality through a new and more rigorous registry are ongoing.[1] Unlike other study countries, this presents a unique opportunity for Panama to focus efforts not only on resource allocation, but also on leveraging this infrastructure to collect information on other variables that inform quality and value for cancer care. Electronic health records are not used in over 75% of facilities around the country, which poses an area of opportunity for Panama.[2]

Mechanisms for effective assessment of data, needs and resources

The Ministry of Health, the Instituto Oncológico Nacional (ION), and the Asociación Nacional Contra el Cáncer (ANCC) are working jointly to assess root causes of challenges such as delayed access to treatment. This is an important example for the region, where common fragmentation of cancer control bodies often serves as a barrier to effective cancer care. A critical shortage of the oncological workforce is one contributing factor to notable treatment delays, in addition to a shortage of professionals able to effectively assess new approaches to care, technologies and treatments. By strengthening alignment of the education and health research infrastructure with the health system, Panama will be better equipped to take advantage of its investments in data improvement, and improve relatively underdeveloped infrastructure for health technology assessments, economic evaluation and more generally, strategic resource allocation.[3] Where economic evaluations are conducted in the country, long assessment processes are cited as contributing delays in access to care.

Pathways for integration of evidence-based decision-making into care

The ANCC's broad network of 20 chapters and seven clinics helps to distribute services more widely, including for the 33% of people living in rural areas. It works closely with ION, which is responsible for the provision of treatment. The country has a new national cancer control plan which has not yet been publicly released, but will be critical to aligning the country's health system on key objectives for cancer care. However, with a new minister of health in the country, it is important that efforts be made to ensure continuity and adoption of this plan. Panama has produced updated care guidelines that provide useful mechanisms to integrate evidence-based decision-making into the care environment. Non-governmental organisations are also increasingly important in cancer care decision-making. Civil society (which includes patient organisations, non-profit clinics, etc.) plays an important role in both advocating for quality care, and sharing resources and best practices for providing quality care.

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The way forward

By focusing attention on better data, assessment, and integrating more effective decisions into care, Panama can improve its ability to allocate resources more strategically and improve cancer outcomes. The release of the new cancer control plan will be an important addition to the enabling environment for cancer care. Panama can also boost this environment through the following strategic actions:

- Increase prioritisation of data quality, including leveraging national registry infrastructure, to conduct an assessment of additional variables that may better-inform care.
- Ensure multi-stakeholder alignment and robust monitoring of the newly released national cancer control plan.
- Utilise economic evaluation and other tactics to encourage leaders to rapidly increase health sector spending, in alignment with other high-income countries.
- Develop stronger relationships with universities and training programmes that can equip Panama with a more agile and effective workforce for assessment.
- Employ targeted efforts to place cancer high on the political agenda of the government, including alignment on the new national cancer plan.

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Notes and acronyms

a. Six basic screening tests include: cervical cytology (PAP), acetic acid visualisation (VIA), breast palpation/clinical breast exam, mammogram, faecal occult blood test or faecal immunology test, and bowel cancer screening by exam or colonoscopy
b. WHO Essential Medicines List contains 24 oncology drugs
c. International Atomic Energy Agency (IAEA) generally recommends four machines per 1 million residents
d. Coverage may be overestimated due to lack of data regarding machine age, condition and distribution
e. Equates to roughly 540 new cases per clinical oncologist
f. Based on IAEA recommendation of dual-trained medical and radiation oncologists
g. Overall surgeon density; data on oncological surgeons not available
h. Arrows indicate Panama's burden in comparison to regional and global income group averages
i. Total cost includes direct and indirect cost in 2009. More recent data was not available.
j. Per patient cost based on 2009 cancer incidence.

ALICC – Asociación Latina e ibérica Contra el Cáncer
ANCEC – Asociación Nacional Contra el Cáncer
DALY – Disability-adjusted life year
EML – WHO Essential Medicines List
EHR – Electronic health record
GDP – Gross domestic product
HI – High income
HTA – Health technology assessment
imPACT – integrated mission of Program of Action on Cancer Therapy
PBCR – Population-based cancer registry
PPP – Purchasing power parity
RedETSA – Red de Evaluación de Tecnologias en Salud de las Américas
UHC – Universal health coverage
UICC – Union for International Cancer Control

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PERU

DECISION-MAKING TO OPTIMISE CANCER CARE

Among our study countries, Peru falls within the lower end of the environment for decision-making to optimise care resources. The analysis below assesses key forces that both enable and resist optimisation of cancer care in the country. By focusing on strengthening enabling forces and reducing the impact of resisting forces, Peru can better optimise cancer care, particularly with the new iteration of Plan Esperanza on the horizon.

Peru cancer care decision-making landscape

	Enabling forces (Strong 4 3 2 1 Weak)	Resisting forces (Weak 1 2 3 4 Strong)	
Robust data	**Data:** Legislation governs EHR use; approximately 40% PBCR coverage with efforts to improve quality	**Data:** No obligation to report cancer surveillance; private health system does not share EHR data	Robust data
Effective assessment	**Mechanisms:** Ongoing efforts to strengthen HTA and evaluation infrastructure (DIGIMED, National Cancer Institute, IETSI); conducted imPACT review to establish baseline for decision-making	**Industry influence:** Majority of local research funded by pharma sector, impedes trust in results	
	Collaboration: Prioritisation of regional and international collaboration for best practices	**Collaboration:** No formal mechanism for various stakeholders to participate in the HTA process	Effective assessment
	Innovation: Value placed on implementing innovative treatment modalities through INEN	**Coordination:** Segmented healthcare system with disparate HTA bodies; slow HTA processes impede access	
Integration into care	**Planning:** Plan Esperanza, currently being evaluated and updated, provides national model for linking evidence to cancer care	**Planning:** Expiration of Plan Esperanza created gap in cancer program coordination	Integration into care
	Local focus: Decentralisation of cancer care through Plan Esperanza to provide more effective, localised access	**Infrastructure:** Reported insufficient prevention and primary care leading to late stage and more costly diagnosis	

Optimisation of cancer care

Cancer treatment

Screening/diagnostics	1 of 6 basic tests generally available[a]
Cancer medicines	83.3% of EML always available[b]
Oral morphine	Generally available
Radiotherapy unit density (per 1 million)	1.1[c] (est. 51-75% coverage)[d]

Cancer workforce

Medical oncologists	130 (4.3 per 1 million)[e]
Radiation oncologists	47 (1.5 per 1 million)
Oncologists needed	179[f]
Surgeon density	0.29 per 1,000[g]
Palliative care physicians	*Data unavailable*

Cancer burden[f]

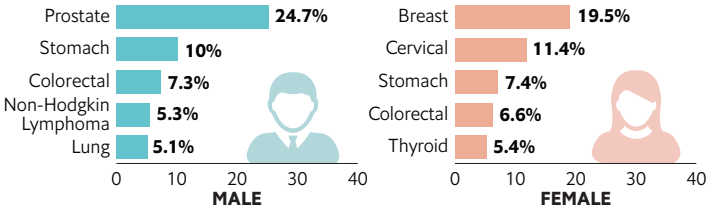
Incidence rate (per 100k): 198
Latin America: 190 ↑
UMI average: 302 ↓

Mortality rate (per 100k): 91
Latin America: 87 ↑
UMI average: 154 ↓

Mortality-to-incidence ratio: 48%
Latin America: 48% ↓
UMI average: 51% ↑

DALYs (per 100k): 2,087
Latin America: 2,521 ↓
UMI average: 3,783 ↓

Top five cancers by % of annual incidence



Country Snapshot

Population
32.2 million

Population living in rural areas
22%

GDP per head (PPP)
US$12,630

Current health expenditure:
5.1% of GDP
UMI average: **5.9% of GDP**

Out-of-pocket spending (% CHE):
28.3%
UMI average: **35.5%**

Health spending per head:
US$316
UMI average: **US$455**

Health coverage:
78% UHC
Global: **64%**

Total cost of new cancer cases: **US$140.8m**[i]
Cost per new case: **US$3,307**[j]

Data are from latest available published sources reviewed by the EIU. See page 70 for notes, definitions and acronyms.

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Peru has been recognised as a leader in the region through its development of Plan Esperanza, a comprehensive cancer control programme that relies on an innovative funding model focussed on equity and quality in cancer care. However, important gaps in data, co-ordination and infrastructure mean that Peru currently rates as moderately weak when it comes to the decision-making environment for cancer care. As Peru moves toward implementation of the next iteration of Plan Esperanza, it has a unique opportunity to strengthen its environment for cancer care provision, especially in the face of a rising cancer burden.

Collecting and utilising robust data

Although Peru does not have any population-based cancer registries that are considered high quality, it does have registries that cover approximately 40% of the population, as well as a national hospital-based registry.[1] However, both incidence and mortality data quality are considered low, with official incidence rates being extrapolated from other modelled and partitioned data. In terms of other supplementary data, Peru prioritised use of electronic health records in 2015 through legislation, but this does not include requirements to report on data, limiting their use for optimal policy-making at the population level.[2]

Mechanisms for effective assessment of data, needs and resources

Peru, similarly to Chile and Argentina, is still in the early phases of establishing a health technology assessment (HTA) agency, called Instituto de Evaluación de Tecnologías en Salud e Investigación.[3] This agency is charged with not only evaluating the safety and effectiveness of technologies, but also the important social impact that they will have on the country within the context of the health system. They also create and evaluate practical clinical guidelines, and have authority to approve inclusion, incorporation, and changes in treatments in the health system. Peru has established informal references for economic evaluation, but they are not legally established and processes to evaluate them are often lengthy.[4] In the absence of structured evaluation, high-cost treatments generally create delays in adoption and implementation, which impedes successful cancer care. In addition, there is no formal mechanism for citizens or industry to participate in the HTA process, but the public can request them or provide information in some cases.[5] Better multi-stakeholder collaboration for assessment of new treatments and technologies would help to bridge these gaps.

Pathways for integration of evidence-based decision-making into care

The expiration of the previous version of Plan Esperanza has created a gap in cancer programme co-ordination. However, the success of Plan Esperanza's legacy efforts to decentralise care and overcome geographical barriers for Peru's rural population are an important building block for implementation. Peru has also conducted an integrated mission of Program of Action on Cancer Therapy (imPACT) review, a unique assessment tool to determine areas of importance in cancer care implementation, and prioritised the integration of innovative treatment modalities through the national cancer insititute, Instituto Nacional de Enfermedades Neoplasicas.[6] However, significant disparities still persist. For example, it is estimated that 85% of oncologists live in Lima, leaving few to cover other parts of the country.[7] Likewise, there is insufficient prevention and primary care around the country, which leads to late-stage and more costly diagnosis. The forthcoming plan will be an important mechanism to create a platform for evidence-based decision-making to be better integrated into care.

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The way forward

Beyond the notable impact Plan Esperanza has had in the country, Peru can continue to strengthen its environment to optimise cancer care in some of the following ways:

- Find innovative ways to incentivise better data sharing across the decentralised health system among care workers and clinicians, which may require a focussed effort on improving infrastructure for communications and technology.
- Prioritise robust monitoring of the implementation of the updated Plan Esperanza, with a focus on optimisation of resources.
- Create forums for multi-stakeholder collaboration, including civil society, in HTA and other assessment processes.
- Prioritise stronger distribution of the workforce through innovative training and workshare programmes employed elsewhere in the region.

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Notes and acronyms

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e. Equates to roughly 331 new cases per clinical oncologist
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g. Overall surgeon density; data on oncological surgeons not available
h. Arrows indicate Peru's burden in comparison to regional and global income group averages
i. Total cost includes direct and indirect cost in 2009. More recent data was not available.
j. Per patient cost based on 2009 cancer incidence.

DALY – Disability-adjusted life year
DIGIMED – Dirección General de Medicamentos, Insumos y Drogas
EML – WHO Essential Medicines List
EHR – Electronic health record
GDP – Gross domestic product
HTA – Health technology assessment
IETSI – Instituto de Evaluación de Tecnologías en Salud e Investigación
imPACT – integrated mission of Program of Action on Cancer Therapy
INEN – Instituto Nacional de Enfermedades Neoplasicas
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