

# The Cancer Preparedness Index: Objectives, methods and dissemination

**Alan D Lovell**, Economist Intelligence Unit, London, UK; **Anelia Boshnakova**, Economist Intelligence Unit, London, UK and **Zain Taha**, Economist Intelligence Unit, Haryana, India

The differences in cancer incidence, mortality and survival between countries can at least partly be traced back to varying national policies and infrastructures. The Cancer Preparedness Index – with its 45 indicators clustered into three domains – is designed to highlight differences in policy and systems between countries and how they relate to outcomes. The Index was built via a literature review and expert input. The results will be presented during the 2019 War on Cancer conferences.

Cancer is the world's second biggest killer, causing one in six deaths. It is also one of the leading global causes of morbidity. As well as the human cost, there is the significant financial burden—cancer was estimated to cost the world a staggering US\$ 1.16 trillion in 2010 (1). While much of this cost is felt in high income countries, the burden of cancer care will increasingly fall on lower- and middle-income countries, in which 70% of cancer deaths already occur (2). The economic consequences are likely to be devastating, particularly for those countries just climbing out of poverty.

Cancer is no longer always a death sentence, and cancer survivorship is on the rise (3). This presents new and growing challenges for national health systems and wider society. Cancer is still primarily a disease of the elderly, and with longer life expectancies, increasing incidence rates and improved survival, people live longer with cancer—or under its shadow. Improved survivorship is a good news story, providing hope for many individuals and their families, but it can create difficulties for policy-makers, healthcare professionals and patients.

There are large differences in cancer incidence, mortality and survival between countries. These differences reflect a combination of factors: prevalence of underlying risk factors, variations in susceptibility, and differences in cancer detection, reporting, classification systems, treatment, and follow-up. There is a need to reinforce healthcare infrastructure, strategies and policies to reduce incidence and improve outcomes. Health policies and systems need to be better prepared to meet the challenge of cancer; to reduce human suffering for individuals and economic costs for society. How well prepared are countries today, and what could they be doing better?

## Why an index?

The goal of reducing incidence and improving outcomes is one

easily agreed by all stakeholders. The more challenging issue is how can this be done within limited healthcare budgets; what are the inputs that offer the best “bang for the buck”, and who is leading the way in implementing evidence-based policy and systems?

There is good evidence around “what works” when it comes to cancer policy. For example, screening and early detection programmes have been well researched: cervical cancer incidence has shown a marked decrease with the advent of screening programmes in several high-income countries (4). Similarly, previous research here at the EIU has found an association between that quality of cancer care plans and the percentage change in DALY: the better the plan, the bigger the fall in DALYs (unpublished). To summarize the state of knowledge, WHO have put together a list of policy “best buys” in tackling NCDs, including cancer (5). The document ranks the relative effectiveness of interventions ranging from vaccinations to smoking cessation programmes to advertising bans. However, even though the evidence is often clear, a brief look across different countries will show that there is often little consistency in the formulation and implementation of policy.

The Cancer Preparedness Index is designed to highlight how policies vary from country to country, how well they're implemented, and how associated they are with cancer outcomes. The Index will be able to monitor the progress of countries across the globe in their fight against cancer and be a tool for advocating change where it is needed.

## Methods

The Index is effectively a collection of policy indicators associated with high-quality outcomes. Scores for each indicator—after normalization and weighting—are summed

to give an overall score for each country. These composite country scores will be used to rank countries according to their success in promoting and funding best-practice strategies and initiatives, and in delivering care through suitable health-system infrastructure. We describe here the five key stages of the research: 1) literature review, 2) expert panel, 3) index development, 4) data collection, and 5) index finalization.

**1) Literature review:** The literature review, performed by experience health information specialists, was used to define the research question, key concepts, and the aims of the study. The search covered both published (including MEDLINE, PubMed and Embase) and grey literature. Our review synthesized evidence-based recommendations and descriptions of good practice, and was used to develop a draft index framework. The draft framework consisted of potential domains and indicators, along with a draft scoring schema for each indicator.

**2) Expert panel:** Once the draft index framework was completed we convened an expert panel. The panel included high-level stakeholders from the Union for International Cancer Control, the World Bank, the European Society for Medical Oncology, the Brazilian Ministry of Health, the Joint Action innovative Partnership for Action Against Cancer, the Colombian League against Cancer, and Youth Cancer Europe. Through critique of the draft framework, the panel advised on the design of the index, the selection of indicators and the scoring system. We used input from the meeting to refine the index framework, including the specification of domains, indicators and weights, and the development of scoring guidelines and scales. The panel did not, however, “sign off” the framework; all editorial decisions remained in the hands of the researchers.

**3) Index development:** With the finalized draft framework in hand, we then performed a data audit. The audit identified which indicators had pre-existing data sources we could use from multilateral organizations such as the WHO and the World Bank, NGOs, or published research in the literature. For those indicators where data sources were not available, we set down what research was needed and the likely sources, be it in the literature or via interviews of national experts. We also developed scoring guidelines: some indicators have simple binary scores (e.g. yes/no) while others allow for more discrimination (e.g. yes/no/partial). The final framework (“the Index”) was then shared with the expert panel for their final comments.

**4) Data collection:** The Economist Intelligence Unit has a network of country contributors that we were able to use to score individual countries. Indicators were scored through a combination of desk research and interviews. Desk research included a review of national policies, plans and

strategies, a search of the healthcare literature, and trawling for quantitative and qualitative information from regional or international sources. Alongside the desk research, country contributors performed interviews of national experts to obtain a more nuanced assessment of a country’s activity in its fight against cancer. National authorities are beset with forms and requirements from national and international organizations; in order not to add to their workload the research for the Index was performed solely by the Economist Intelligence Unit and its contributors.

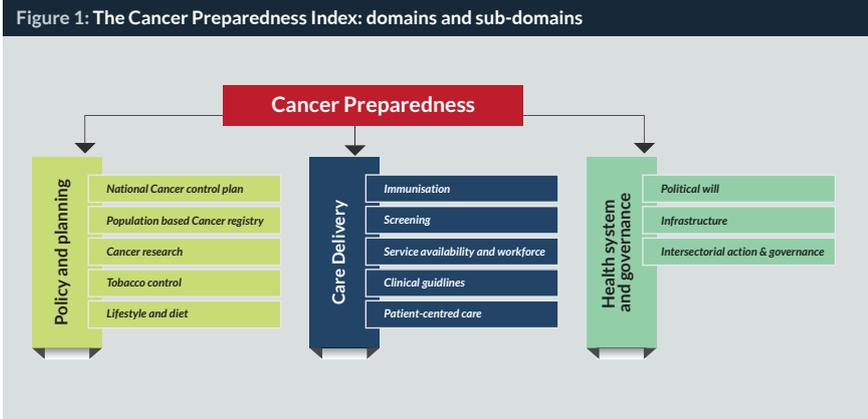
**5) Index finalization:** Scores were peer reviewed by the research team; where there was uncertainty we asked for more information or clarification from the country contributor. In the case of disagreement scores were finalized via discussion and consensus within the project team. Scores were normalized on a scale of 0 to 100, where 0 is the lowest score and 100 the highest. The final scores were collated and categorized in an Excel workbook, where we were able to conduct sensitivity analyses and perform a final sense check (against other studies and through comments received from the expert panel). Further functionalities were then added to the workbook such as interactive weight profiles, country and region comparison tools, and heat maps.

## The Index

The Cancer Preparedness Index has three domains: 1) policy and planning, 2) care delivery, and 3) health system and governance. The first domain focuses on levers that are mostly in the hands of policy-makers. It examines whether countries are taking the necessary steps to effectively understand and manage their cancer burden; also, are they acting to reduce cancer incidence through reducing risky behaviors. The second domain looks at the delivery of cancer-specific activities within health systems themselves, starting with immunization and screening campaigns and working through to the delivery of care for cancer sufferers and survivors. The accessibility of drugs and technologies are included here, along with indicators scoring the comprehensiveness of clinical guidelines and the use of patient-centered care. The final domain acknowledges that cancer cannot be defeated by cancer-focused activities alone. It looks at factors such as political will and intersectoral action, and the provision of universal healthcare and the promotion of a health-enabling environment.

Each of the three domains consists of a number of sub-domains (Figure 1). The first two domains have five sub-domains each, while the third domain has three; we therefore decided to weight the three domains 40:40:20.

Each sub-domain consists of two or more indicators. There are a total of 45 indicators in the Index: 17 in the policy and planning domain, 20 in care delivery and 8 in health system



is growing fastest: in upper- and lower-middle income countries. We hope to extend the research to more countries in future iterations of the index—including to low income countries (where access to data can be more of a challenge).

**Dissemination and next steps**

The Index and associated research and dissemination programme is designed to drive dialogue and action by policy-makers around the world. It focuses on

and governance. Normalized indicator scores will be summed to give a sub-domain score, which again will be normalized and summed to give domain scores. These weighted sum of these normalized domain scores will give an overall score for each country—from 0 to 100—allowing them to be ranked.

Table 1 provides an example of a scoring schema for one of the indicators. The example is taken from the policy and planning domain; the sub-domain is national cancer control plans. For this sub-domain there are four indicators, each one with its scoring scheme. This example demonstrates that, in the case of national cancer control plans, it's not just whether a country has a plan, but also the quality of the plan (such as the presence of explicit timeframes, implementation plans and funding sources) that is important. Other indicators follow a similar pattern, by rewarding not only presence or absence of certain activities or policies but, where possible, issues of quality or implementation too.

Data will be collected for 28 lower-middle, upper-middle and high income countries (Table 2). Included countries are from Europe, Asia-Pacific, Latin America, North America, Africa and the Middle-East. We wanted to not only capture the diversity in policy adoption and implementation in high income countries, but also include comparisons from where the burden of cancer

how healthcare systems can be better prepared to deal with the cancer challenge. The programme will seek to attract global media interest and to engage other important stakeholder groups, such as payers, physicians and care providers.

The initial results of the index will be launched at The Economist's War on Cancer events throughout 2019. The Economist has invited policy-makers and industry leaders to a global series of thought-provoking events aimed at mobilizing policy, financing, capacity-building and partnerships to confront the enormous challenge cancer presents since 2015. These conferences, under the War on Cancer banner, serve as an ideal opportunity to disseminate the results of the index.

The Economist Group will also put together a custom-built, online microsite to host the Index and all of the campaign content. The index will be downloadable as an Excel workbook with functionality to allow the user to plot results against background indicators, generate heat maps, alter indicator weightings and other functionality. The microsite will be interactive and accessible for desktop, tablet and mobile users. A promotion and amplification plan will drive awareness of the microsite and stimulate engagement and, we hope, repeat visits.

In addition to the Index results we shall be researching

**Table 1: Example of scoring schema from four indicators in the National Cancer Control Plan sub-domain**

Sub-domain	Indicators	Scoring schema
National cancer control plan	Existence of operational policy/strategy/action plan for cancer	No plan = 0 Part of NCD plan = 1 National cancer control plan (NCCP) = 2
	Comprehensiveness of cancer plan	Cancer targets and indicators +1 Coverage of continuum of cancer care services - prevention (+1), early detection and diagnosis (+1), treatment (+1), supportive and palliative care (+1), patient-centred care (+1)
	Implementation framework for cancer plan	Leadership for plan implementation +1 Timeframes (start and end dates) +1 Financial resources for plan activities +1
	Monitoring and evaluation of cancer control plan	Cancer control governance (as per national plan) +1 Health information systems for monitoring plan activities +1

Table 2: The 28 countries included in the Index, organized by World Bank income group

<b>High income</b>	Australia; Canada; France; Germany; Italy; Japan; Netherlands; Saudi Arabia; South Korea; Spain; Sweden; UK; USA
<b>Upper-middle income</b>	Argentina; Brazil; Chile; China; Colombia; Mexico; Romania; Russia; South Africa; Thailand; Turkey
<b>Lower-middle income</b>	Egypt; India; Indonesia; Kenya

*Alan Lovell, MA, is a Senior Associate at EIU Healthcare, with a focus on health policy and systems research. He is also the Senior Review Group Manager for the National Institute for Health Research (NIHR) Dissemination Centre. Alan studied biology at Royal Holloway, University of London, and gained his doctorate from the University of Warwick. He worked at the University of Montreal, before receiving his MA in Information Studies from Brighton University.*

and publishing a white paper. This will summarize the global findings of the research, offer analysis of the Index results, and provide insights and conclusions on how effectively systems are prepared for cancer. Because the Index is a comparative tool, all countries are scored using the same schema. However, countries will naturally have differing priorities, depending on their income level, demographic profile and other factors; for example, it may not be cost-effective for some countries to fund screening programmes. It's therefore important to see the results in context, which is what the white paper will do. The paper will include qualitative analysis from 11 in-depth interviews with high-level cancer experts, including clinicians, policy-makers and patients. It will be available on the hub alongside the downloadable Index, and together we hope they will help advocate for effective policy development in the field of cancer control and preparedness.

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*Anelia Boshnakova, MA, MLS, is a Senior Health Policy Analyst and Information Specialist at Bazian, responsible for carrying out systematic searches and critical appraisal for evidence reviews. Anelia has an MA in English from Sofia University St Kliment Ohridski, Bulgaria, and a Master's degree in library science (MLS) from Syracuse University, USA.*

*Dr Zain Taha, MA, PhD, is an analyst in The EIU Healthcare team, based in the Gurgaon office, with particular interest in health policy. Zain holds a Master's degree in biotechnology and a PhD in chemical engineering from the University of Nottingham. His research examined the impact of the non-living world on the growth and development of traditional medicine in Malaysia.*

Corresponding author:

*Alan Lovell, Economist Intelligence Unit, London, UK.*

*alanlovell@eiu.com*

### References

1. IARC. World Cancer Report 2014. Lyon: International Agency for Research on Cancer (IARC); 2014. Available from: <http://publications.iarc.fr/Non-Series-Publications/World-Cancer-Reports/World-Cancer-Report-2014>.
2. WHO. Cancer: Key facts. Geneva: World Health Organization; 2018. Available from: <http://www.who.int/news-room/fact-sheets/detail/cancer>.
3. Miller KD, Siegel RL, Lin CC, et al. Cancer treatment and survivorship statistics, 2016. CA: a cancer journal for clinicians. 2016;66(4):271-89.
4. Goldie SJ, Gaffikin L, Goldhaber-Fiebert JD, et al. Cost-effectiveness of cervical-cancer screening in five developing countries. *The New England journal of medicine*. 2005;353(20):2158-68.
5. WHO. Tackling NCDs. 'Best buys' and other recommended interventions for the prevention and control of noncommunicable diseases. Geneva: World Health Organization, 2017.