

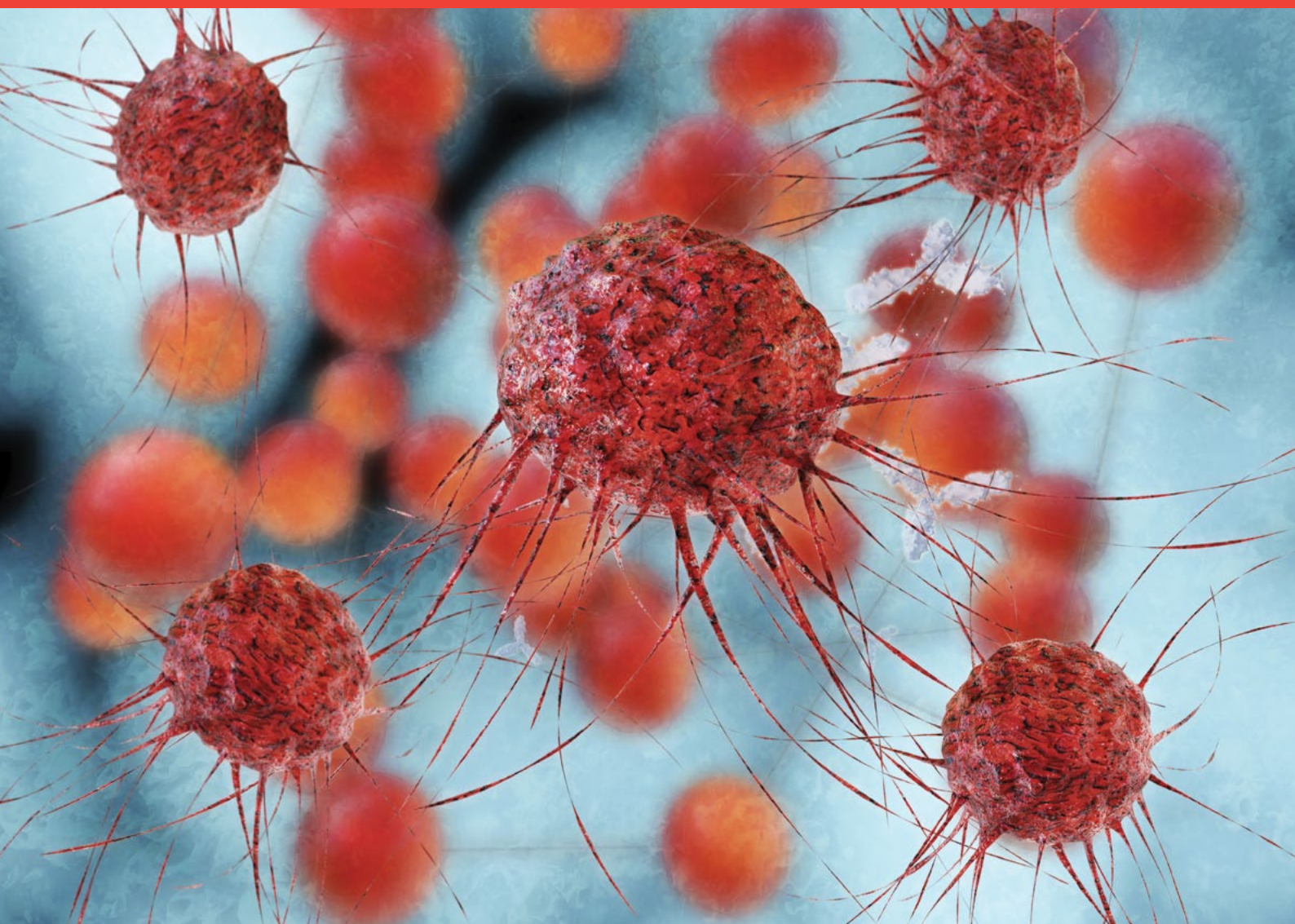
# Cancer

## A tale of two worlds

**Dr Sneh Khemka**

President of International Population Health Solutions

Aetna International



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If I could have been anything,  
I would have wanted to be the  
**president that ended cancer.**<sup>1</sup>

**S**o said U.S. Vice President Joe Biden in the autumn of 2015 as he ruled out a run for the presidency. Biden evoked John Kennedy and the Apollo space programme in calling for a “moon shot” to cure the disease – a disease which had claimed the life of his 46-year-old son, Beau, just a few months earlier. Curing cancer “is possible”, said Biden. And as time passes, he is increasingly correct.

“Cancer” is understood around the world as the word you never want to hear your doctor say. In the past, inadequate understanding of its causes, coupled with inadequate treatment, made it appear to be a death sentence. The truth is that cancer is not a single disease. It is a wide range of conditions, some of which may well be eradicated in future. Take two examples. We now understand the link between the human papillomavirus (HPV) and cervical cancer. A vaccination has been developed. Likewise, the link between tobacco and lung cancer is well-established and global incidence of the disease will diminish in the years ahead if we can move towards a world that does not smoke. Those two examples capture the twin challenges ahead. Improvements in technology and healthcare are one side of the equation to increasing cancer survival rates; even curing some types of the disease. Governments – whether through supporting research, promoting public health and widening access to treatment – also have a major role to play.

However, the other side of the equation is how our personal choices shape our future health. The choice to make

lifestyle changes can diminish the threat of certain cancers to each of us. To take another example, the potential to eradicate colon cancer is uncertain. However, if we change the amount of red meat we eat, and change patterns of early symptom checking and diagnosis, the threat will diminish and survival rates will improve. We have more influence over our health than we tend to think.

We are all on a journey from that decades-old perception of cancer as a death sentence to understanding cancer as a range of chronic but – with early intervention and effective treatment – survivable conditions. Yet where you are on that journey depends on where you are in the world.

#### **CANCER IN THE DEVELOPING WORLD**

Lifestyle choices are shaped by information; access to healthcare depends on infrastructure and investment. In the developed world, improving public awareness of the health implications of diet choices and lifestyle, and access to improving technology and treatment, are helping to increase the likelihood of surviving cancer. This is not the case for 80% of the world’s population.

Let’s paint the scene by numbers. In 2012, there were 14.1 million new cancer cases, 8.2 million cancer deaths, and 32.6 million people living with cancer (within five years of diagnosis) across the globe. The majority of deaths (65%), and new cases (57%) were in developing countries.<sup>2</sup> One

1. <https://www.bostonglobe.com/2015/10/21/biden-calls-for-moonshot-cure-cancer/xFpvVCitoOhVTsUE1sI5JP/story.html>

2. <http://www.who.int/mediacentre/factsheets/fs297/en/>

**8.2 million**

people die each year from cancer, an estimated 13% of all deaths worldwide.<sup>2</sup>

**70%**

increase in new cases of cancer expected over the next 2 decades.<sup>2</sup>

**>100**

cancer types exist, each requiring unique diagnosis and treatment.<sup>2</sup>

forecast from the Harvard School of Public Health predicted that 70% of all new cancer cases will occur in developing nations by the year 2050.<sup>3</sup>

The World Health Organisation’s cancer research institute IARC has argued that the \$320 billion invested worldwide each year on cancer treatment and prevention could be better spent – on prevention – and if it was, the number of cancer deaths could be cut by half. Four out of every five of these “avoidable deaths” would be in the developing world, according to IARC.<sup>4</sup> The argument for action is clear; the need urgent.

Now let’s look at one global lifestyle choice related to cancer: smoking. The WHO predicts that tobacco-use will account about 8.4 million deaths by the year 2020 – a combination of lung and heart disease, stroke and cancer. It

is said that 70% will be in the developing world. Why should that be so? According to the WHO:

“Just as infectious diseases know no geographic or political boundaries, individual countries are incapable of effectively containing tobacco consumption. Tobacco companies have increased marketing activities in developing countries, where about 900 million smokers live, accounting for 70% of global consumption ... Many of the forces that support globalization, such as the opening up of a country’s markets, allow the tobacco problem to increase.”<sup>5</sup>

Globalisation is changing lifestyles and patterns of health across the world – bringing affluence and new opportunities, but new health risks with it. In this case, ongoing public health campaigns in the developed world about smoking and the risks of cancer are helping citizens make healthier lifestyle choices. Indeed, early studies suggest a significant health impact from the British Government’s ban on smoking in public places in 2007.<sup>6</sup>

Whether governments in the developing world follow suit – adopting methods such as bans on tobacco advertising and sponsorship, or introducing white packaging – remains to be seen. But what may cloud the argument in favour of any such actions by developing countries is the monies generated for governments through tobacco taxation; for example, in China an estimated 6% of the nation’s tax take. How developing countries grapple with such considerations will likely influence the pace at which attitudes and behaviours towards tobacco usage may change, both for citizens and governments alike.

Yet, if globalisation has opened the door to increased tobacco consumption in the developing world, there are also cultural factors at work behind the prevalence of certain types of cancer in certain territories. Take sub-Saharan Africa, where liver cancer related to the hepatitis B virus is a growing concern, partly through the combination of aging and growing populations, social and economic change. In southern parts of China, there

3. <http://www.hsph.harvard.edu/news/magazine/shadow-epidemic/>

4. <http://www.economist.com/news/international/21597962-burden-cancer-falling-increasingly-heavily-poor-worse-aids>

5. <http://www.who.int/trade/glossary/story089/en/>

6. <http://www.nhs.uk/news/2010/06June/Pages/Heart-attacks-fall-after-smoking-ban.aspx>



**Cancer will never be cured**, primarily because it is not one disease but a wide range of conditions. Cells replicating is part of the natural process of life; when that goes wrong it causes cancers.

are raised rates of oesophageal and stomach cancer linked to the consumption of smoked fish. In India, the rate of oropharyngeal cancer is significantly higher than in western Europe because of the consumption of betel nut. To take that final example, if the Indian Government was to discourage or ban betel nut in paan, the risk of that particular form of throat cancer would all but disappear. Governments can play a role in regulation of certain products as well as educating its people on health risks associated with products and lifestyles.

#### **ACCESS TO TREATMENT: A TALE OF TWO WORLDS**

If better personal lifestyle choices are the micro level solution, investment in research, health infrastructure and widening access to effective treatments are the macro level solutions.

In the developed world, the three core elements of cancer treatment – surgery, radiotherapy and chemotherapy – have seen improvements in recent years.

Twenty years ago, a surgeon in London or New York faced with a breast cancer case would have removed the patient's entire breast and usually the lymph nodes in the armpit. Now, because of fine needle aspiration and core biopsy, the surgeon can tell the type of cancer and remove only part of the breast and one or two lymph nodes if that's the best treatment based on the patient's specific condition. The

outcome is better for the patient: physically, mentally, and cosmetically.

With radiotherapy, we are becoming much more precise. IMRT and IGRT (Intensity Modulated and Image Guided Radiotherapy) technology means targeting cancerous cells with a higher dose of radiation. But the preciseness of the targeting leads to fewer side effects.

With chemotherapy, the pharmaceutical industry has helped drive forward our approach to cancer treatment over the last two decades. The release of new molecular entities has changed survival rates for a range of cancers; from Herceptin in breast cancer, to monoclonals being used in the blood-based cancers, or Bevacizumab in bowel cancer.

Technology is also helping anticipate cancer and improve early diagnosis and prevention. Genetic testing – such as the identification of BRCA, the mutation of the BRCA1 and BRCA2 genes – has given new ways to predict a woman's susceptibility to breast cancer and lead to more targeted therapies. To take one example, the actress Angelina Jolie was found to have a genetic predisposition to both ovarian and breast cancer and took the courageous decision to have both breasts and her ovaries removed. It is a course of action that would not have been thought of even 15 years ago. But genetic testing is changing the way we look at diseases like cancer and how we treat them.





## Despite the medical advances, **the key is in changing culture and attitude.**

Yet what of the developing world, where the health infrastructure all too often does not match the need for treatment? We have seen that the number of new cases and death toll claimed by cancer will be borne heavily in the developing world in the decades to come. What happens in the developing world – as I have seen for myself in Papua New Guinea and Africa – is that patients tend to know something serious is wrong, they may well suspect they have cancer, but they have no access to any sort of health care facility.

So as well as improving public understanding of conditions, what appears to be a bleak path ahead could be changed with improved screening programmes and even rolling out traditional radiotherapy machines in the developing world.

### THE PROBLEM

Cancer is a leading cause of death worldwide, accounting for 8.2 million deaths in 2012.<sup>2</sup> The most common causes of cancer are cancers of:

- Lung (1.59 million deaths)
- Liver (745,000 deaths)
- Stomach (723,000 deaths)
- Colorectal (694,000 deaths)
- Breast (521,000 deaths)
- Oesophageal cancer (400,000 deaths)

Imagine the impact of these machines across India, China, Africa, and other territories with burgeoning populations, such as Brazil? Traditional radiotherapy machines cost less than \$1m – far cheaper than the \$150m bill for each of the 36 proton therapy machines in the US. Giving people in the developing world better access to radiotherapy would offer a greater chance of survival.

Similarly, establishing basic health insurance such as the Indian Government has done with a programme called Rashtriya Swasthya Bima Yojan (RSBY). This excellent programme offers those living below the poverty line access to hospital care and a doctor. These sorts of schemes will change significantly the way cancer is treated around the world. It is not about miracle cures; it is about simple access and the financial mechanism for people to seek care when they need it.

### THE PATH AHEAD

Finally, we return to the Rose Garden at the White House and the spirit of Joe Biden's speech. The Vice President was right to be optimistic. There are good grounds to hope that some forms of cancer will be "cured" or become chronic rather than fatal conditions in future. But no single institution – not even a World Health Organisation – will cure the disease around the world. Geographical trends already show a widening gap between the developed and the developing world for cancer survival.

Those with access to good information and good levels of care, private or state-funded, when they need it will have very different outcome in the years ahead. But that path can be changed. More must be done in every country to take us further along the road to tackling cancer – in treatment and infrastructure, but also education, prevention, public health, and the way we lead our lives.