

Worldwide Incidence of Colorectal Cancer: a 10-year Forecast (2017-2027)

Introduction:

Colorectal cancer (CRC) is the third most commonly diagnosed cancer worldwide with the incidence growing due to an increase in associated risk factors such as unhealthy diet, lack of exercise, obesity and smoking. Screening has also been shown to impact incidence.

Aim:

To estimate and compare the global incidence of CRC by region over the next ten years attributable to the uptake of CRC screening programs and increased risk factors.

Methods:

Using a critically appraised set of country-specific cancer registries and appropriate ICD-10 codes (C18, C19 and C20), CRC incidence was estimated for 45 countries grouped into six distinct regions and representing approximately 90% of the world's population.

We identified screening programs as a protective factor associated with CRC and developed an incidence forecast model which incorporates the effect of screening in developed countries with established screening programs.

For most developing countries where screening for CRC is either non-existent or very low, GDP per capita was considered as a proxy for multiple risk factors associated with CRC on the assumption of a correlation between a country's healthcare system (representing access to screening), and economic development. A trend based on the correlation between estimated GDP per capita and age-standardized incidence was adopted.

Age- and gender-specific diagnosed incidence for each country was multiplied by United Nations' age- and gender-specific population estimates (United Nations, 2015) for each forecast year to estimate the number of diagnosed incident cases. To estimate the number of incident cases globally, aggregate estimates for each region were divided by the proportion of countries in that region for which direct estimates were made using the methods described above.

Results:

In 2017, we estimate there were 1.8 million incident cases of CRC globally and we forecast this figure will grow to 2.6 million in 2027 (Fig 1).

These incident cases are split almost evenly across high and low-income countries in our base year (Fig 2).

CRC incidence varied from 6.5 per 100,000 in the Middle East and Africa to 83.7 per 100,000 in high-income Asia-Pacific (Fig 3). Incident cases was highest in lower-income Asia-Pacific (737,000) and lowest in Middle East and Africa (103,000) (Fig 4).

Over the next ten years, lower income countries are projected to have the highest growth rates (70% in lower-income Asia-Pacific, 53% in Latin America and 48% in Middle East and Africa) with smaller increases in the higher income countries (Fig 5).

With CRC being an age related tumour, Fig 6 shows expected regional population changes over our forecast period which would lead to a further increase of incident cases over the next 10 years attributable to aging population demographics.

Figure 1. CRC Global Incident Cases

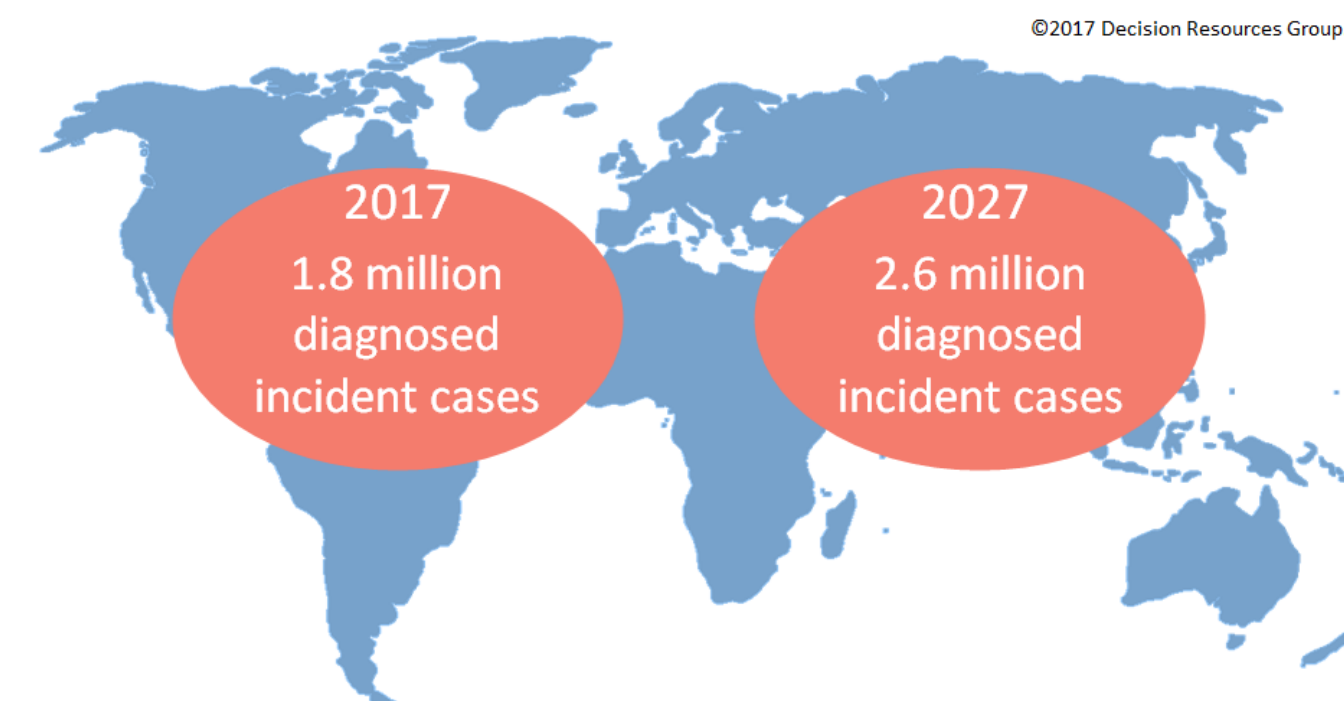


Figure 2. CRC Incident Cases by Income Status in 2017

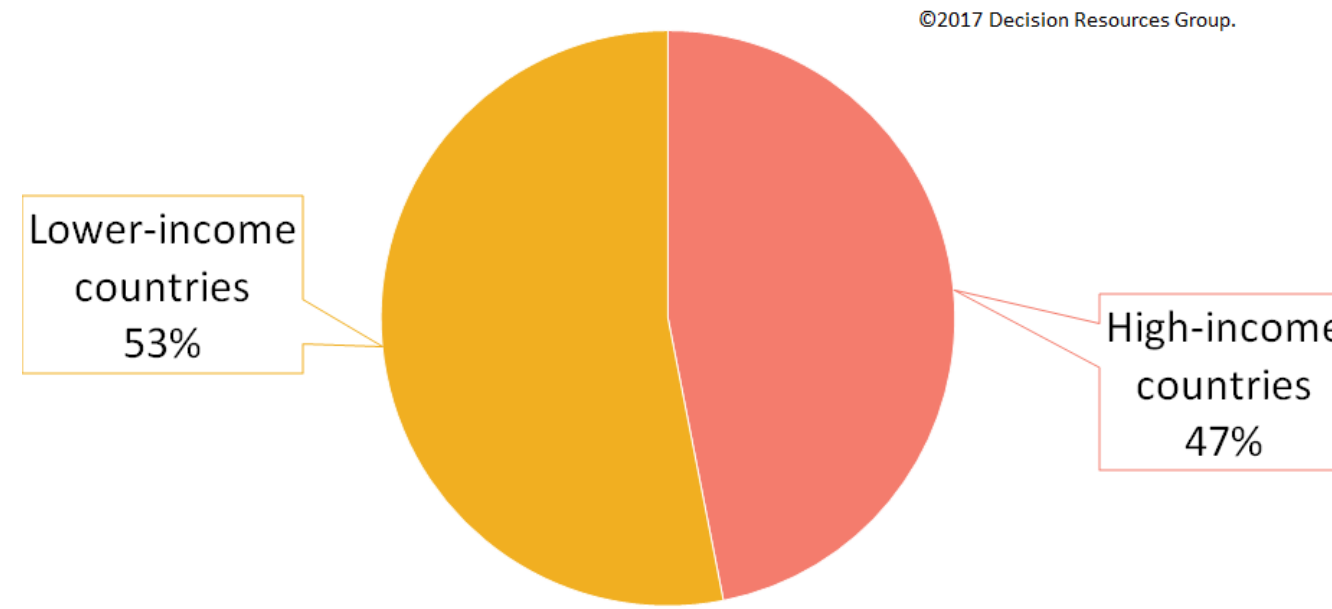


Figure 3. CRC Incidence by Region in 2017

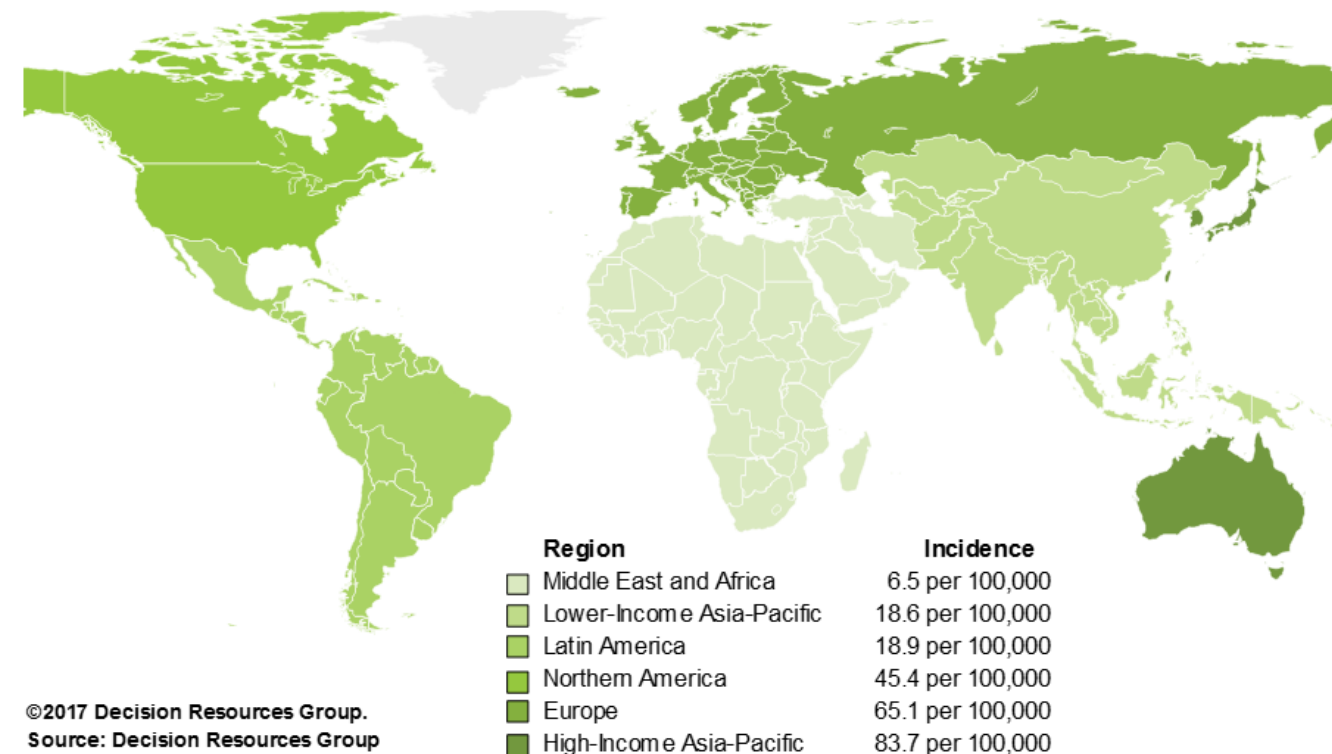


Figure 4. CRC Incident Cases by Region in 2017

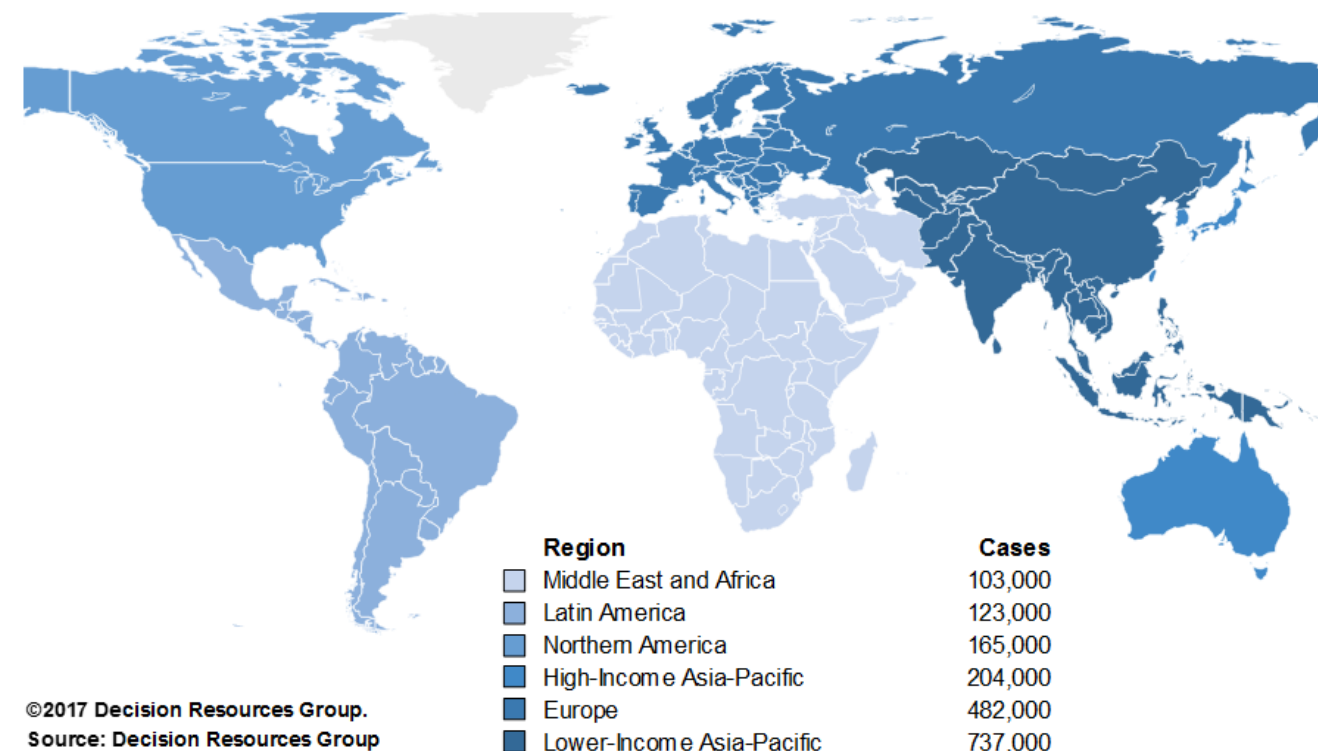


Figure 5. Ten-year (2017-2027) CRC Growth Forecast by Region

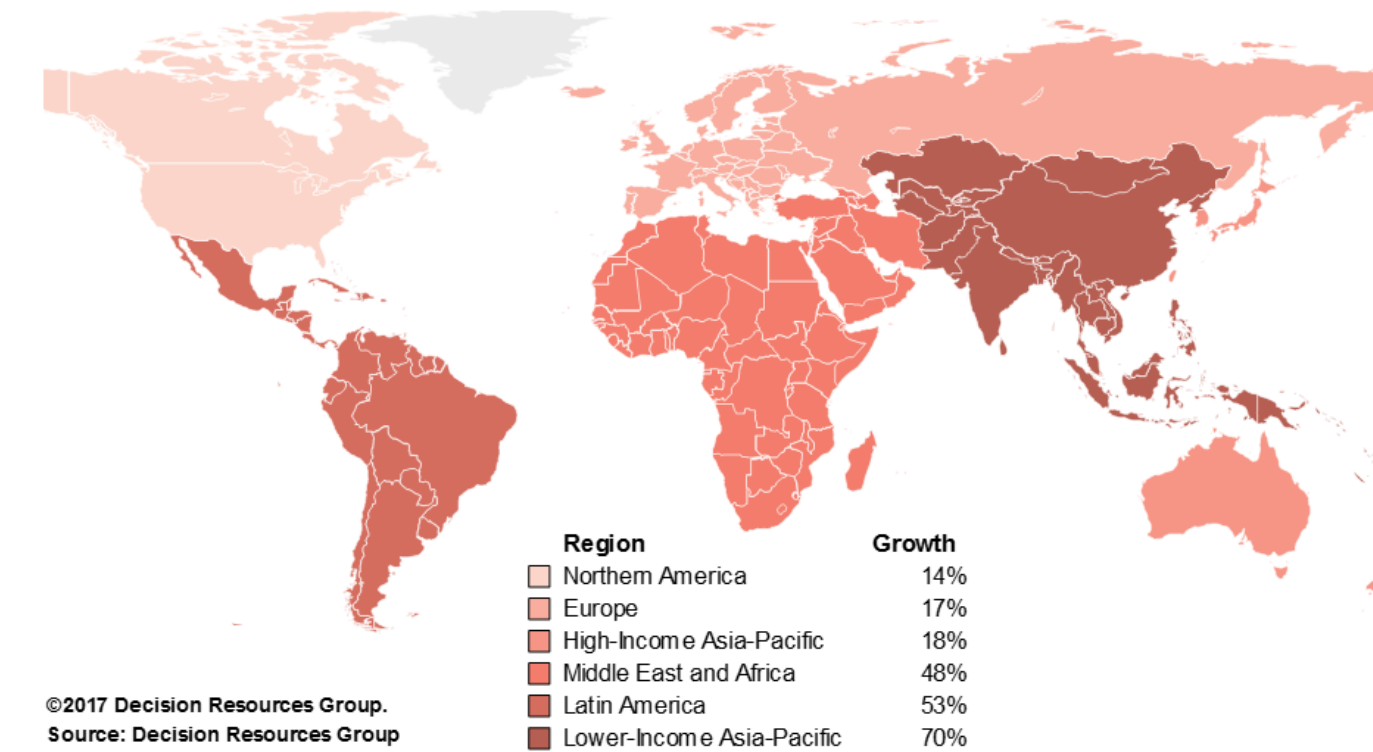
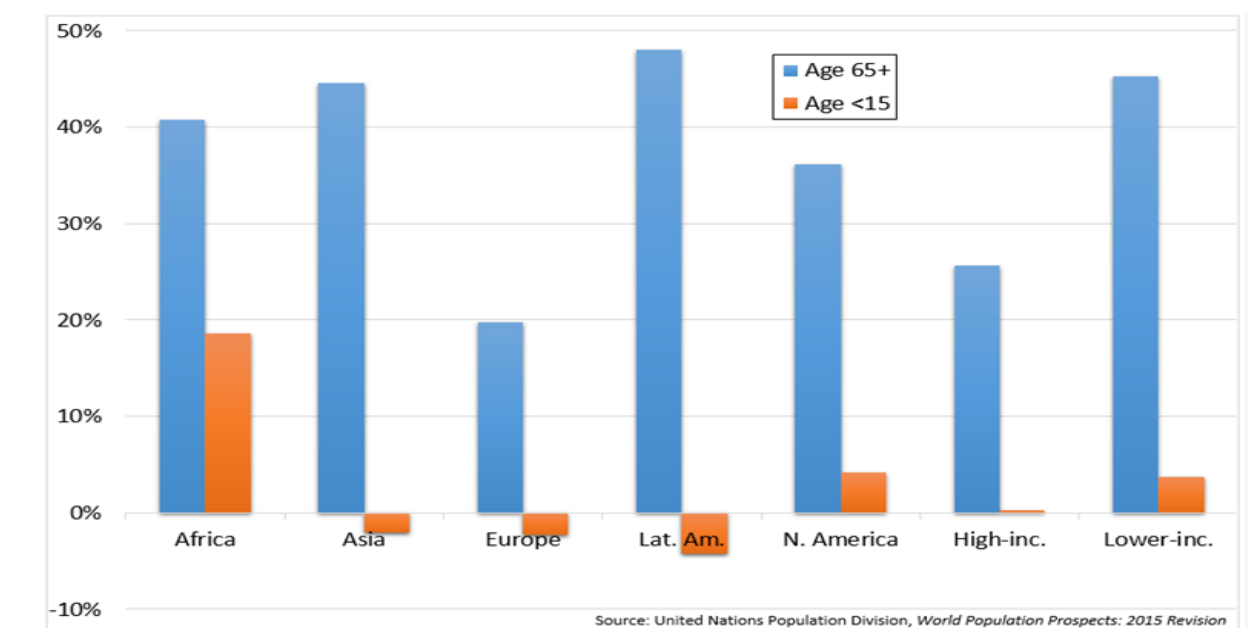


Figure 6. United Nations Population Growth Rates (2017-2027)



Conclusion:

The incidence of CRC varies by region globally. The major factors affecting incidence are increased risk factors and uptake of screening. The protective impact of screening is outweighed by the increase in lifestyle-related risk factors leading to an increase in CRC incident cases globally. Population dynamics have a bigger role to play in the future incidence of CRC globally.

References

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