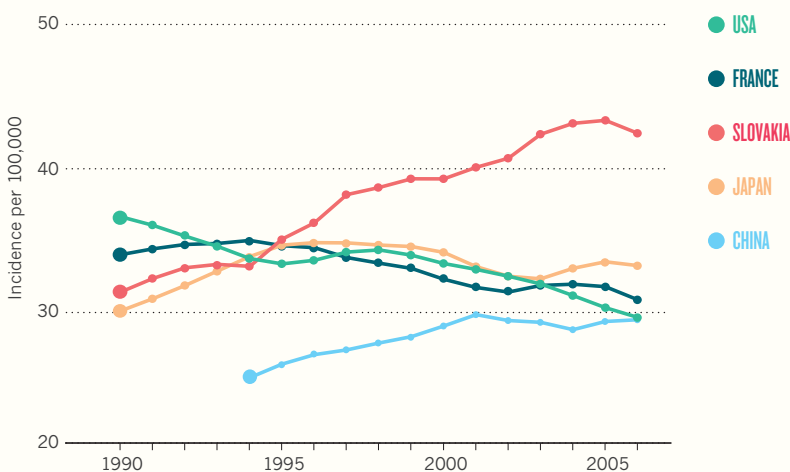
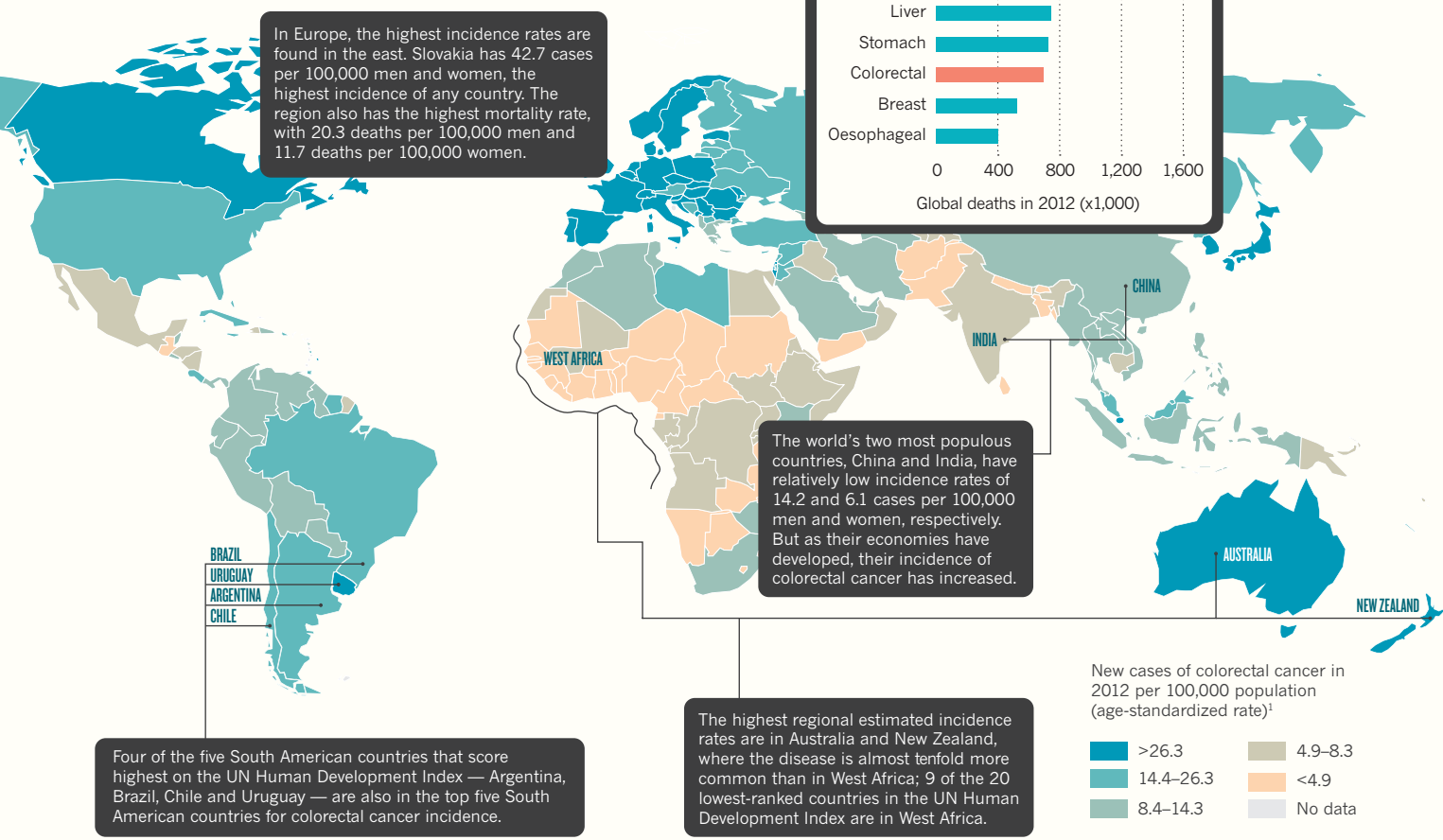


# A DISEASE OF GROWTH

Colorectal cancer occurs throughout the world but is most common in developed countries. As heavily populated countries such as China undergo rapid economic development, the incidence of the disease looks set to increase. An animated version of this infographic is at [go.nature.com/wgiqyp](http://go.nature.com/wgiqyp). By David Holmes.

## DISEASE AND DEVELOPMENT

More than half (55%) of the cases of colorectal cancer occur in developed regions, but developing countries are catching up. As the economies of countries such as Brazil, China and India grow, so does their incidence of colorectal cancer<sup>1</sup>.



## HEALTH OF NATIONS

Global trends in colorectal cancer closely follow economic fortunes<sup>2</sup>. Incidence in Western Europe has been relatively flat for two decades, coinciding with a period of economic stability or decline. Meanwhile, Eastern European countries such as Slovakia have experienced rapid economic growth from a lower base, and have seen a corresponding rise in colorectal cancer.

Looking further east, Japan experienced a rapid rise in cases between 1990 and 1995, followed by almost ten years of steady or falling incidence. This period, termed 'the lost decade' by economists, saw falling wages and economic stagnation. By contrast, the breakneck development of Japan's neighbour China was accompanied by a dramatic rise in colorectal cancer incidence.

References: 1. Globocan, 2012 <http://globocan.iarc.fr>; 2. International Agency for Research on Cancer, <http://ci5.iarc.fr>; 3. Cancer Research UK; 4. Chan, D. S. M. et al. *PLoS One* **6**, e20456 (2011); 5. Larsson, S. C. & Wolk, A. *Int. J. Cancer* **119**, 2657–2664 (2006); 6. US National Cancer Institute Surveillance, Epidemiology, and End Results Program, <http://seer.cancer.gov>; 7. Galiatsatos, P. & Foulkes, W. D. *Am. J. Gastroenterol.* **101**, 385–398 (2006);

# A PREVENTABLE EPIDEMIC

## DIET



Many foods have been linked with increased (animal fat, sugars) or decreased (garlic, fibre, calcium) risk of colorectal cancer<sup>3</sup>, but the most compelling evidence for increased risk relates to the consumption of red and processed meats<sup>4,5</sup>.

## GENETICS



Having a first-degree relative with colorectal cancer increases the risk of the disease by 80%. By the age of 40, almost all adults with familial adenomatous polyposis<sup>7</sup> will have colorectal cancer, and *BRCA1* mutations may also increase risk.

## OBESITY



Closely linked to diet and physical inactivity, obesity also increases the risk of colorectal cancer. One 2013 study<sup>10</sup> found that obese people have a 33% higher risk of colorectal cancer than people of healthy weight.

## AGE



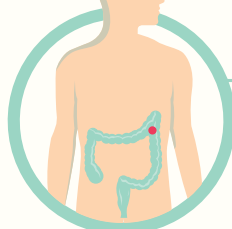
One of the most crucial factors for colorectal cancer is age. Up to 90% of all colorectal cancers occur in people aged 50 years and over<sup>6</sup>.

## EXERCISE



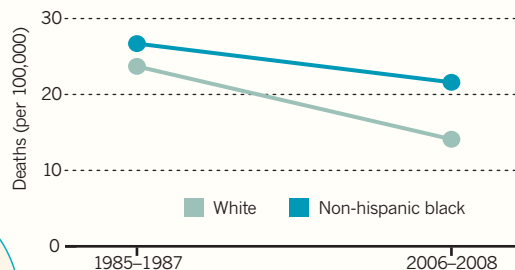
The World Cancer Research Fund and the American Institute for Cancer Research both identify exercise as protective against colorectal cancer. Colorectal cancer risk is 17–24% lower in the most physically active people compared with the least physically active<sup>8,9</sup>.

## SCREENING



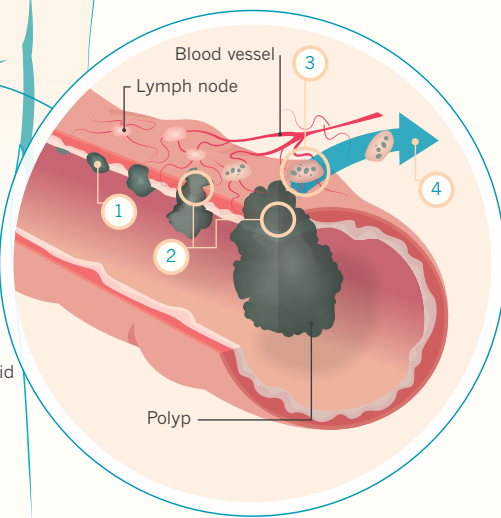
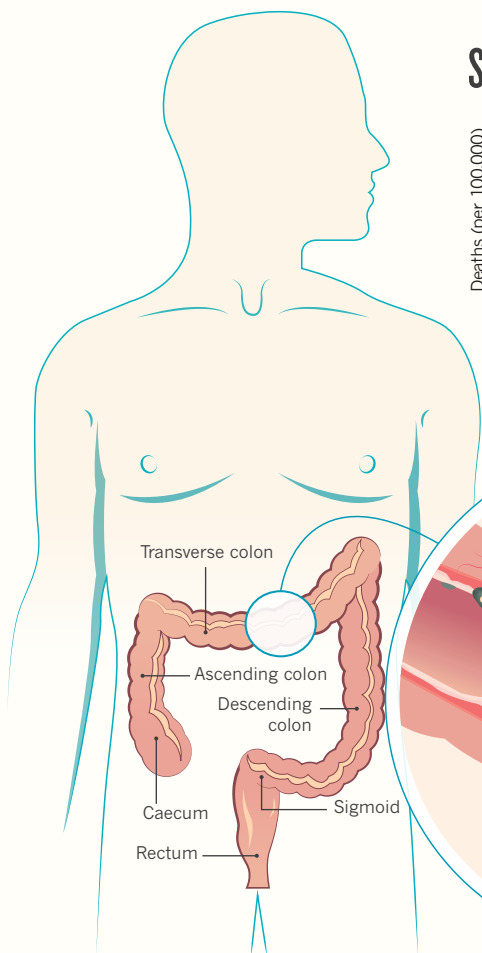
Screening finds precancerous polyps that can be removed before they become cancerous. The problem is ensuring access. In the United States, for example, one-third of adults over 50 have not been screened appropriately.

## SURVIVAL: NOT BLACK AND WHITE



The decline in colorectal cancer mortality in the United States has not been shared equally<sup>11</sup>. In the 1980s, African Americans died at a 13% higher rate than white Americans from the disease. Two decades later, they died at a 53% higher rate<sup>12</sup>. This disparity is caused by factors including differences in how likely they are to receive the latest treatments, and the prevalence of other health problems.

AMERICAN CANCER SOCIETY



## HOW IT SPREADS

Colorectal cancer affects the colon and the rectum, parts of the digestive system known as the large intestine. It usually begins as a non-cancerous growth called a polyp on the inner lining of the intestine.

## WHAT ARE THE STAGES OF COLORECTAL CANCER?

- 1 Cancerous cells form on the inner lining of the large intestine.
- 2 Cancer cells grow into the wall of the colon or lymph vessels.
- 3 Cancer cells penetrate the blood or the lymph vessels.
- 4 Cancer cells spread into nearby lymph nodes, and can also be carried in the blood vessels to other organs.

8. Robsahm, T. E. et al. *Eur. J. Cancer Prevent.* **22**, 492–505 (2013); 9. Boyle, T. et al. *J. Natl Cancer Inst.* **104**, 1548–1561 (2012); 10. Ma, Y. et al. *PLoS One* **8**, e53916 (2013); 11. Siegel, R., DeSantis, C. & Jemal, A. *CA Cancer J. Clin.* **64**, 104–117 (2014); 12. Robbins, A. S., Siegel, R. I. & Jemal, A. *J. Clin. Oncol.* **30**, 401–405 (2012).