Comparison of the incidence of colorectal cancer in young adults between the USA and Europe

We read with interest the article titled 'Increasing incidence of colorectal cancer in young adults in Europe over the last 25 years' by Vuik *et al*, in which they analysed trends in colorectal cancer (CRC) among young adults (20–49 years old) and found that CRC incidence is increasing among young adults in Europe.[1] We have found that the incidence of CRC in young adults in Europe is significantly different from that in the USA.[2] Therefore, we analysed the incidence of CRC in young adults with data from the Surveillance, Epidemiology and End Results database (from 1990 to 2016, a total of 78 295 cases, aged from 20 to 49 years) by the Joinpoint regression method and compared it with the results from Europe.

We found that the incidence of CRC in young adults in the USA increased annually, with an annual per cent change (APC) of 4.3% in the age group of 20–29 years, 2.47% in the age group of 30–39 years and 1.8% in the age group of 40–49 years (figure 1A–C). Although the incidence rate was increasing, the mortality rate had not changed significantly, which may be related to young adults presenting with more local or regional disease.[3–5] We know little about the indications for colonoscopy in young adults, but studies have shown increases in colonoscopy use that parallel the incidence of CRC in young adults, which could explain the increasing rates of local or regional disease.[4] Conversely, some studies reported that CRC in young adults was more aggressive and resulted in worse survival, perhaps because they had more mucinous and signet ring cell histology, had a family history of CRC and were less likely to be screened.[6] In addition, we found that while the incidence of CRC in Europe was

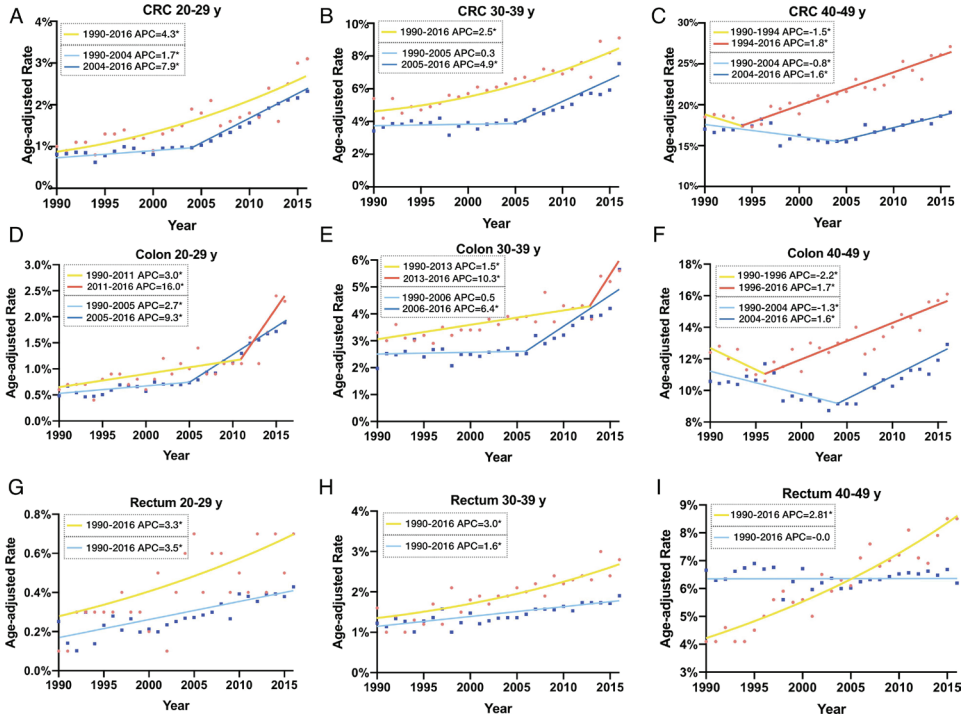

Figure 1 (A) The APC in patients with CRC aged 20–29 years old in the USA is 4.3%. In Europe, the APC was 1.7% from 1990 to 2004 and 7.9% from 2005 to 2016. (B) The APC in patients with CRC aged 30–39 years old in the USA is 2.47%. The APC in Europe from 1990 to 2005 was 0.3%, with an annual increase of 4.9% from 2005 to 2016. (C): The APC in patients with CRC aged 40–49 years old in the USA was reduced by 1.5% between 1990 and 1994 but increased by an average of 1.8% per year from 1994 to 2016. In Europe, the APC decreased by 0.8% between 1990 and 2004 but increased by 1.6% per year thereafter. (D) The APC in patients with CRC aged 20–29 years old in the USA from 1990 to 2011 was 3.0% and was as high as 16.0% from 2011 to 2016. The APC in Europe was 2.7% from 1990 to 2005 and 9.3% from 2005 to 2016. (E) The APC in patients with colon cancer in the age group of 30–39 years in the USA was 1.5% from 1990 to 2013 and reached 10.3% from 2013 to 2016. The APC in Europe from 1990 to 2006 was 0.5%, and from 2005 to 2016, it was 6.4%. (F) The APC in patients with colon cancer aged 40–49 years in the USA decreased by 2.2% per year from 1990 to 1996 and increased by an average of 1.7% per year from 1999 to 2016. The APC in Europe from 1990 to 2004 was −1.3%, with an average annual rate of 1.6% from 2004 to 2016. (G) The incidence rates of rectal cancer in patients aged 20–29 years old in the USA and Europe are increasing by 3.3% and 3.5% per year, respectively. (H) The APC in rectal cancer in the USA among those aged 30–39 year is 3.03%, compared with 1.6% in Europe. (I) In the USA, rectal cancer in patients aged 40–49 years is increase at a rate of 2.8% per year, while the incidence in Europe remains stable. *: APC is significantly different from zero. '– yellow' and '– orange' line: APC in incidence rates in the USA, 1990–2016. '• yellow' and '• orange' dot: aged-adjusted rates in the USA. '– dark blue' and '– light blue' line: APC in incidence rates in Europe, 1990–2016. '• dark blue' and "• light blue' dot: aged-adjusted rates in Europe. APC, annual per cent change; CRC, colorectal cancer.

also increasing in young adults, the rate of increase in the USA was significantly higher than that in Europe (figure 1A–C). This may be because the USA has a significantly higher incidence of obesity than Europe. In 2012, the obesity rate in the USA was 35%, and it was as high as 39.8% in 2016; however, in Europe, the obesity rate was approximately 15.9% in 2014.[7] Next, we observed that the APC in the USA ranged from 3.0% (1990–2011) to 16.0% (2011–2016) in the age group of 20–29 years (figure 1D), and from 1.5% (1990–2013) to 10.3% (2013–2016) in the age group of 30–39 yearss (figure 1E). The trend in the incidence of CRC in patients aged 20–39 years became steeper in 2011–2013. This may be related to the US government's implementation of the Affordable Care Act in 2010, after which the proportion of adults aged 19–34 years who were uninsured reduced from 28% in 2013 to 18% in 2016.[8] The incidence of CRC in both the USA and Europe is growing the fastest in the age group of 20–29 years and the slowest in the age group of 40–49 years (figure 1A–C). This is likely because the incidence of CRC in young adults is closely related to family history.[9] The incidence rate of rectal cancer in the age group of 40–49 years in Europe is stable (figure 1I), which may be related to antibiotic use, periodontal disease and pH levels across the entire colorectum.[4]

In summary, the incidence of CRC in young adults in the USA is significantly higher than that in Europe, and the specific reasons for this difference need to be studied in depth, which may help to take specific measures to reduce the incidence of CRC.

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