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RE: Colorectal Cancer Incidence Patterns in the United States, 1974–2013

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In the latest issue of the Journal, Siegel et al. (1) report that young adults born around 1990 (and so currently age 20 to 29 years) have double and quadruple the risk of colon and rectal cancer (CRC), respectively, compared with the same age group born in 1950. We believe presenting relative increases in incidence isolated from the absolute risk of CRC in younger adults can be misleading. Using relative or ratio measures to communicate risk of young-onset CRC may lead the casual reader or popular press to misinterpret the extent to which incidence is increasing.

An appealing feature of ratio measures is their tendency to yield larger, more impressive numbers than simple rate differences (2). However, presenting increases exclusively in relative terms can have a dramatic effect on their interpretation and distort the overall impact of such increases. Consider CRC incidence among individuals age 20 to 29 years as an example—incidence increased by 125.0% from 1984–1988 to 2009–2013, but this corresponds to a rate difference of only one per 100 000 (Table 1). The group age 60 to 69 years experienced a 44.9% decline in CRC incidence or a rate difference of about 85 per 100 000 during the same period. Despite a smaller relative change in incidence, the older age group saw a far bigger absolute difference in rates. That is, the population impact of changes in CRC incidence was much greater among older adults.

Ratio measures have another major weakness—they mask underlying risk (2). Relative increases in young-onset CRC appear alarming. But without information on underlying CRC risk in younger adults, readers cannot judge clinical significance. Among individuals age 20 to 29 years, five-year risk of CRC remains very low, at 1 in 11 100, even after the 125.0% relative increase in incidence. This risk is lower than risk of death from HIV, suicide, homicide, motor vehicle accident, and even accidental poisoning among similar age groups (4,5). Presenting underlying risks alongside ratio measures helps provide the necessary context for accurate interpretation (6).

Exaggerated perceptions of increases in young-onset CRC based on ratio measures may lead to unwarranted enthusiasm for lowering the recommended age to initiate CRC screening.

Table 1. Age-adjusted incidence rates (per 100 000 persons) of colorectal cancer in 2009–2013 vs 1984–1988 by 10-year age group*

Age group, y	Incidence rate, 1984–1988	Incidence rate, 2009–2013	Relative change, %	Absolute difference
20–29	0.8	1.8	+125.0	+1.0 per 100 000
30–39	4.5	7.1	+57.8	+2.6 per 100 000
40–49	19.4	23.6	+21.6	+4.2 per 100 000
50–59	73.5	61.2	–16.7	–12.3 per 100 000
60–69	188.9	104.1	–44.9	–84.8 per 100 000
70–79	356.3	190.2	–46.6	–166.1 per 100 000

*Age-adjusted incidence, calculated using the 2000 US standard population, was obtained by using SEER*Stat version 8.3.2, Surveillance, Epidemiology, and End Results 9 registries, 1973–2013 (3).

There are clear benefits to screening in older populations, and the temptation is to believe that benefits would be similar for younger adults. Indeed, Siegel et al. imply that the age to initiate screening for average-risk persons should be reconsidered. To ensure a net benefit, however, any change in screening recommendation must consider the trade-offs between potential benefits and harms (e.g., colonic perforation, cost) measured in absolute terms (7), not simply relative increases in incidence alone.

CRC incidence has increased in younger age groups—and it is important to study the causal mechanisms contributing to these observed patterns. But currently, absolute risk is still low, and we encourage readers to take caution in overinterpreting the relative increases in incidence.

Note

The authors declare no conflicts of interest.

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