Incidence of colorectal cancer in young adults in Europe

Fanny E.R. Vuik
Erasmus MC University Medical Center, Rotterdam

Stella A.V. Nieuwenburg, Marc Bardou, Iris Lansdorp-Vogelaar, Mário Dinis-Ribeiro, Maria J. Bento, Vesna Zadnik, Maria Pellisé, Laura Esteban, Michal Kaminski, Stepan Suchanek, Ondřej Ngo, Ondřej Májek, Marcis Leja, Ernst J Kuipers, Manon C.W. Spaander
Colorectal cancer (CRC)

- Colorectal cancer (CRC) is the second most common cancer in Europe
  - 14% of all cancer diagnoses\(^1\)

- Decrease in CRC incidence in the screening population\(^2\)
  - Early detection through screening
  - New therapies

---

2. Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov).
CRC in young adults

- An opposite trend has been suggested for young adults
Risk Factors

- Obesity
- Physical inactivity
- Diabetes mellitus
- Alcohol consumption
- Processed meat
Countries with an increase in CRC incidence in young adults
Countries with an increase in CRC incidence in young adults
Aim

To analyse trends in CRC incidence in young adults in Europe
Inclusion
Subjects
- Young adults: 20-39 years
- Prescreenees: 40-49 years

Statistics
Joinpoint regression analyses
*Determine temporal trends in CRC incidence*

Annual percent change (APC)
*Represents the rate of change in cancer incidence per year in a given time period*
Example Joinpoints

\[ \tau_1 = 1989 \]
\[ \tau_2 = 2000 \]

\[ \beta_1 = -0.004975 \]
\[ \beta_2 = 0.1019 \]
\[ \beta_3 = 0.01794 \]

**Joinpoints** represent the timing for a statistically significant change in rate trend.
Example APC

\[ \beta_1 = -0.004975 \]

\[ \tau_1 = 1989 \]

\[ \beta_2 = 0.1019 \]

\[ \tau_2 = 2000 \]

\[ \beta_3 = 0.01794 \]

**APC (Annual Percent Change):** slope of segment

**Joinpoints** represent the timing for a statistically significant change in rate trend.
Results
Countries included

- Sweden
- Norway
- Finland
- Iceland
- Greenland
- Ireland
- United Kingdom
- The Netherlands
- Belgium
- Germany
- Poland

- Slovenia
- Latvia
- Italy
- France
- Catalonia
- Portugal
- Czech Republic
- Switzerland
- Denmark
Incidence of colon and rectal cancer
Incidence

* indicates that APC is statistically significant different from zero
Incidence

* indicates that APC is statistically significant different from zero

CRC

20-39 y

1990-2008 APC = 1.4*
2008-2016 APC = 5.9*

40-49 y

1990-2005 APC = -0.3
2005-2016 APC = 1.4*
Incidence

* indicates that APC is statistically significant different from zero
Incidence

* indicates that APC is statistically significant different from zero
Incidence

CRC

20-39 y
1990-2008 APC = 1.4*
2008-2016 APC = 5.9*

40-49 y
1990-2005 APC = -0.3
2005-2016 APC = 1.4*

Colon

1990-2008 APC = 1.5*
2008-2016 APC = 7.4*

1990-2005 APC = -0.6
2005-2016 APC = 1.7*

Rectum

1990-2016 APC = 1.8*

1990-1999 APC = -2.1
1999-2016 APC = 0.7*
Incidence

20-39 y

40-49 y

CRC
Incidence

20-39 y

40-49 y

CRC
Incidence per European country
Incidence per European country

- 65% Increase in incidence of CRC
- 5% Decrease in incidence of CRC
- 30% No change in trend
Mortality of colorectal cancer
CRC related mortality

20-39 y

1990 - 2016 APC = 0.9

40-49 y

1990-2009 = APC = -2.4*
2009-2016 APC = 1.3

* indicates that APC is statistically significant different from zero
Conclusion

- CRC incidence increases in young adults in Europe
- Cause of this trend is still unknown
- Awareness should be created for both general public and clinicians
- Further research is needed to identify etiological factors