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ABOUT COVER

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Colorectal cancer in Arab world: A systematic review

Nahed A Makhoulf, Muhammad Abdel-Gawad, Aya M Mahros, Sameh A Lashen, Mariam Zaghloul, Ahmed Eliwa, Eman E Elshemy, Zainab Ali-Eldin, Doaa Abdeltawab, Fathiya El-Raey, Dalia Omran, Marwa Khalaf, Nancy Fanous, Ahmed Shawkat Abdelmohsen, Ahmed Abu-Elfath, Mohamed Abdelghani, Mahmoud Farouk, Mohamed Abdelaziz, Mohamed Alboraie

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Abstract

BACKGROUND

The incidence of colorectal cancer (CRC) is increasing among young individuals in the Arab world as well as in other regions of the world.

AIM

To explore the incidence and prevalence of CRC in the Arab world.

METHODS

The PubMed, Scopus, Web of Science, EBSCO and Wiley databases were searched to retrieve relevant articles irrespective of the language or the publication year. The search terms were “(“colon OR rectum OR sigmoid OR rectal OR colonic OR colorectal”) AND (“cancer OR malignancy OR malignant OR neoplasm”) AND (“Jordan” OR “United Arab Emirates” OR “Bahrain” OR “Tunisia” OR “Algeria” OR “Djibouti” OR “Saudi Arabia” OR “Sudan” OR “Syria” OR “Somalia” OR “Iraq” OR “Oman” OR “Palestine” OR “Qatar” OR “Comoros” OR “Kuwait” OR “Lebanon” OR “Libya” OR “Egypt” OR “Morocco” OR “Mauritania” OR “Yemen”). Reviews, meta-analyses, and articles containing nonoriginal data were excluded. Retrieved articles were screened, and relevant data were extracted. Descriptive statistics were used for data analysis.

RESULTS

Nine studies were included. Five of the studies provided information regarding the prevalence of CRC. The prevalence of CRC was 0.72% in Saudi Arabia and 0.78% in the United Arab Emirate, while in Egypt, it ranged from 0.4% to 14%. Four studies showed information regarding the incidence. The annual incidence rate of CRC in Qatar was 7.5/100000/year. In Egypt, the crude incidence rate (CIR) in males was 3.1 for colon cancer and 1 for rectal cancer, while in females, it was 2.3 for colon cancer and 0.8 for rectal cancer. The age-standardized rate for CRC incidence in 2003 was 36.90 for males, 26.50 for females, and 30.49 for both sexes in Saudi Arabia. In 2016, the CIRs in Saudi Arabia were 3.6 and 2.1 in females for colon cancer and rectal cancer, respectively, while in males, it was 3.3 and 2.8 for colon cancer and rectal cancer, respectively. One study in Egypt revealed that 25% of CRC cases occurred among individuals younger than 40 years old.

CONCLUSION

There is a considerable prevalence of CRC in some Arab countries. More studies are needed to explore the incidence and prevalence of CRC in the rest of the Arab world.

Key Words: Colorectal cancer; Incidence; Prevalence; Arab world

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Core Tip: Colorectal cancer (CRC) represents the third most common cause of cancer globally. Although only a few studies have addressed the prevalence and incidence of CRC in the Arab world, this systematic review found that there is a considerable prevalence of CRC in Egypt, Saudi Arabia, Qatar and the United Arab Emirate. More studies are needed to explore the incidence and prevalence of CRC in the rest of the Arab world.

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INTRODUCTION

Colorectal cancer (CRC) is the third most common cancer (10.0%), and it is the second leading cause of cancer deaths worldwide (9.4%)[1].

In the past decade, an increase in the incidence of CRC has been observed worldwide. Additionally, there is increase in the prevalence of CRC in the younger population, and new cases are expected to increase among the younger population aged 20–49 years by 2030[2,3].

In particular, the prevalence of CRC is increasing among young individuals in the Middle East and other regions in the world[4,5]. These changes in the incidence and epidemiology of the disease presentation have also been observed in the Arab world [2]. The influence of Western lifestyles on the Arab population has led to an increase in the prevalence of CRC and affected younger populations[2].

To our knowledge, there has been no systematic review on CRC prevalence and/or incidence in the Arab World.

The primary aim of this review was to explore the prevalence and/or incidence of CRC in the Arab world by reviewing the available literature studies from Arab countries.

MATERIALS AND METHODS

Literature search

The PubMed, Scopus, Web of Science, EBSCO and Wiley databases were searched using the following search terms: “(“colon OR rectum OR sigmoid OR rectal OR colonic OR colorectal”) AND (“cancer OR malignancy OR malignant OR neoplasm”) AND (“Jordan” OR “United Arab Emirates” OR “Bahrain” OR “Tunisia” OR “Algeria” OR “Djibouti” OR “Saudi Arabia” OR “Sudan” OR “Syria” OR “Somalia” OR “Iraq” OR “Oman” OR “Palestine” OR “Qatar” OR “Comoros” OR “Kuwait” OR “Lebanon” OR “Libya” OR “Egypt” OR “Morocco” OR “Mauritania” OR “Yemen”), to retrieve relevant articles irrespective of the language or the publication year of the articles. For non-English articles, all relevant data were taken from the English abstract, and two reviewers translated the full text to English to retrieve all other data of interest. Reviews, meta-analyses, and all other articles containing nonoriginal data were excluded from our review. All retrieved articles were screened and selected by three independent authors. Relevant data were extracted into a standardized data collection sheet by four independent authors. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow chart is shown in **Figure 1**. This systematic review was registered in the PROSPERO registry (CRD42021226703).

Statistical analysis

Descriptive statistics were used for data analysis.

RESULTS

At the time of this review, a total of nine studies containing information about the prevalence and/or incidence of CRC in the Arab world were included[6–14] (**Table 1**). Five studies provided information regarding the prevalence of CRC in Arab Worlds [one from Saudi Arabia[6], 3 from Egypt[9,11,12], and one from the United Arab Emirate (UAE)[13].

The prevalence of CRC was 0.72% in Saudi Arabia[6] and 0.78% in the UAE [13], while Egypt reported different prevalence rates of 0.4%[11], 9.4%[12] and 14%[9].

Among these studies, four showed information regarding the incidence of CRC in the Arab world[7,8,10,14]. In their retrospective analysis of Qatar's area, Rasul *et al*[7] reported an average annual incidence rate of 7.5/100000/year. A retrospective study in Egypt (from 2008 to 2011) revealed that the crude rate in males was 3.1 for colon cancer and 1 for rectal cancer, while in females, it was 2.3 for colon cancer and 0.8 for rectal cancer[10].

The age-standardized rate for CRC incidence in 2003 was 36.90 for males, 26.50 for females, and 30.49 for both sexes in Saudi Arabia, as reported by Ibrahim *et al*[8]. However, another retrospective analysis of Saudi Arabia Ministry of Health Registry data including 13013 participants from general population was conducted in 2016; the crude incidence rates (CIRs) for colon and rectal cancer among females were 3.6 and

Table 1 Summary of included studies

Ref.	Year	Country	Study type	Number of participants	Population	Age	Male	Female	Prevalence	Incidence	Diagnostic test	Period of assessment	Affected colon segment
Salih <i>et al</i> [6]	2014	Saudi Arabia	Retrospective case-control study	1600	General	49 (32-62)	No data		0.72% (12/1600)	No	Colonoscopy and biopsy	No data	No data
Rasul <i>et al</i> [7]	2001	Qatar	Retrospective analysis	45	CRC patients attended to Hamad General Hospital	Mean 57.1, Range 33-83	26	19	No data	24pts/year. Average annual incidence 7.5/100000/year	Biopsy	1994 to 1998	Descending 55.5% and rectum 24%
Ibrahim <i>et al</i> [8]	2008	Saudi Arabia	Retrospective	No data	No data	No data	No data	No data	No data	Age-standardized rate for incidence in 2003 is 36.90 for males, 26.50 for females, and 30.49 for both sexes	No data	1994 to 2003	No data
Gado <i>et al</i> [9]	2014	Egypt	Descriptive cross-sectional hospital-based study.	412	Colonoscopies for symptomized patients	Mean 51. Range 16-80	No data	56% of patient	57 (14%) Peak frequencies were in the 5 th and 7 th . Decade, 25% of cancers occurred in patients aged less than 40 yr	No data	Colonoscopy and biopsy	2000-2012	(53%) in the left colon (sigmoid colon, descending colon and splenic flexure) and (16%) in the rectum, (32%) in the proximal colon (cecum, ascending colon, hepatic flexure and transverse colon, Synchronous tumors in (2%)
Ibrahim <i>et al</i> [10]	2014	Egypt	Retrospective	No data	Colonoscopies	No data	No data	No data	No data	Crude rate in males is: 3.1 for colon and 1 for Rectal cancer. While in females: 2.3 for colon cancer and 0.8 for rectal cancer	No data	2008 to 2011	No data
Elwassief <i>et al</i> [11]	2015	Egypt	Questionnaire	547	Relatives of CRC patients	49 ± 9	335	212	2 (0.4%)	No data	Colonoscopy and biopsy	No data	Distal
Gado <i>et al</i> [12]	2016	Egypt	Retrospective	286	Colonoscopies, 96.5% of cases had symptoms	25.1 ± 22	153	133	27 (9.4%)	No data	Colonoscopy and biopsy	2010-2014	No data
Fayadh <i>et al</i> [13]	2019	United Arab Emirate (UAE)	8 yr observational study	7540	Colonoscopies	Average age (53), 46% of cancers below age 50 and 14% below the age of 40 years	No data	No data	69 (0.78%)	No data	Colonoscopy	2012-2019	No data
Almatroudi	2020	Saudi	Retrospective	13013	General	No data	7116	5897	No data	In 2016 CIR in females	No data	2006 to 2016	Rectum, colon

[14]	Arabia	analysis of Saudi MOH registry data	(4157 colon cancer and 2959 rectal cancer)	for colon cancer is 3.6 and for rectal cancer is 2.1 while in males is 3.3 for colon cancer and 2.8 for rectal cancer
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MOH: Ministry of health; CIR: Crude incidence rate.

2.1, respectively, and the CIRs for colon and rectal cancer among males were 3.3 and 2.8, respectively[14].

Regarding the age of CRC patients, there was predominance in the fourth or fifth decade of life[6,7,11,13]. However, Gado *et al*[9] in Egypt reported two peak frequencies in the fifth and seventh decades; 25% of CRC occurred in patients aged less than 40 years.

DISCUSSION

The updated CRC burden according to the latest GLOBOCAN 2020 estimates demonstrated that CRC ranks third among frequently newly diagnosed cancers, with almost 1.9 million new cases (10.0%), and second leading cause of death worldwide, with approximately 935000 deaths in 2020 (9.4%)[1]. The incidence rates are 4-fold higher in countries with developed economies, mainly in European regions, Australia/New Zealand, and Northern America. Furthermore, the overall CRC trends are increasing for incidence and decreasing for mortality almost all over European countries, with some national and regional variability attributed to differing levels of healthcare expenditure and the resulting quality of screening, diagnosis, and treatment [15,16]. Despite the rising trends of CRC, there is a paucity of data reporting the incidence and/or prevalence of CRC in Arabian countries. The retrieved 9 studies were mostly retrospective data analyses, with only four studies providing information regarding the incidence of CRC in the Arab world[7,8,10,14].

CRC incidence has always been known as an indicator of higher levels of socioeconomic development and is dominant in countries undergoing major economic transition. This is well demonstrated in higher incidence in Europe, Australia and Northern America[17-19]. Additionally, Almatroudi[14], in his large epidemiological study of CRC in Saudi Arabia, showed that there was a markedly increasing incidence of CRC from 2006 to 2016. He attributed that increase to the large-scale screening program that increased the case detection rate and the change toward more unhealthy lifestyles with higher incidence in large cities, such as the regions of Riyadh, Makkah, and Eastern Province, where westernized lifestyles and flourishing industries are more evident. A hospital-based case-control study in Kuwait concluded that CRC risk is

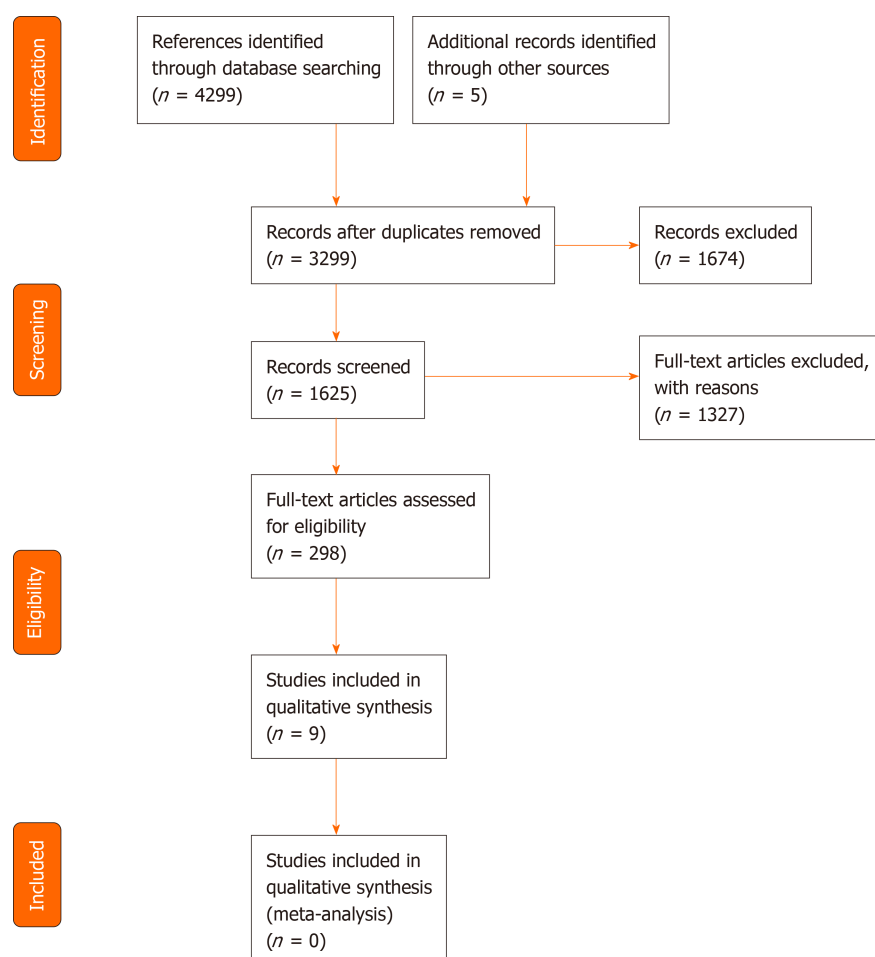


Figure 1 PRISMA 2009 flow diagram.

strongly attributed to higher body mass index, excessive red and processed meat consumption and decreased fruit/vegetable consumption[20].

The rising trend of CRC despite the screening programs adopted in many countries was disappointing. This was partly justified by the favorable outcomes of screening, and a decline in incidence within older age groups was not able to overcome the rising incidence of CRC in a younger population[21-23]. This was in accordance with Fayadh *et al*[13] in their single center experience of CRC screening in UAE from 2012 to 2019, which demonstrated increasing trends in CRC with an average age of 53 years. Of note, 46% of CRC cases were below the age of 50. Furthermore, another single center experience from Egypt reported that approximately 25% of CRC cases occurred in individuals younger than 40 years of age[9].

Limitations of our study

Our study has some limitations. There were few studies that met our inclusion criteria, and many Arab countries were not represented due to the lack of suitable studies for our review. There were not enough data to examine some questions of interest, such as regional differences in the prevalence, epidemiology and risk factors for CRC in Arab countries and the lack of programmed screening and/or surveillance strategies for CRC in most Arab countries.

CONCLUSION

In conclusion, there is a considerable prevalence of CRC in some Arab countries. More studies are needed to explore the incidence and prevalence of CRC in the rest of the Arab world.

Recommendations: Based on the available literature, it is recommended that multicenter prospective studies be conducted to assess the actual prevalence and incidence of CRC in different Arab countries and in different age groups. Proper

utilization of retrospective data emerging from currently running CRC screening programs in some countries and establishment of new screening programs in other countries will guide decisions in management and prevention strategies to contain the rising incidence of CRC in the Arab world. Proper awareness about CRC and early screening among the population represents the initial step to prevent morbidity and mortality resulting from CRC.

ARTICLE HIGHLIGHTS

Research background

Morbidity and mortality of colorectal cancer (CRC) is increasing globally. There is a particular concern about the rising incidence of CRC in young people in different parts of the world.

Research motivation

It is crucial for each country/region to know the actual prevalence, incidence, and predisposing factors for CRC to help in adequate planning for screening programs, preventive measures, and proper allocation of health care resources.

Research objectives

The main objective of this study was to explore and summarize the available evidence about prevalence and/or incidence of CRC in the Arab world.

Research methods

A systematic review of available literature was done to retrieve articles containing original data about CRC in the Arab world. Available data were extracted and summarized.

Research results

Nine studies including data about CRC in 5 Arab countries were found. Reported prevalence of CRC in Saudi Arabia was 0.72%, in United Arab Emirates was 0.78% and in Egypt ranged from 0.4%-14%. Qatar reported an average annual incidence rate of 7.5/100000/year. Egypt reported a crude rate of 3.1 in males and 2.3 in females. In Saudi Arabia, the crude incidence rate for CRC was 3.6 and 3.3 among females and males respectively. CRC tends to occur in the fourth or fifth decade of life, however, 25% of CRC patients were less than 40 years.

Research conclusions

Some Arab countries have a considerable prevalence of CRC. More data are expected to arise from the currently running CRC screening programs.

Research perspectives

Multicenter prospective trials and proper utilization of retrospective data are needed to assess the actual prevalence and incidence of CRC in different Arab countries.

REFERENCES

- 1 **Sung H**, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, Bray F. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. *CA Cancer J Clin* 2021; **71**: 209-249 [PMID: [33538338](#) DOI: [10.3322/caac.21660](#)]
- 2 **Guraya SY**. The prevalence and evolving risk factors for colorectal cancer in the Arab World. *Biomed Pharmacol J* 2018; **11**: 1773-1780 [DOI: [10.13005/bpj/1548](#)]
- 3 **Siegel RL**, Fedewa SA, Anderson WF, Miller KD, Ma J, Rosenberg PS, Jemal A. Colorectal Cancer Incidence Patterns in the United States, 1974-2013. *J Natl Cancer Inst* 2017; **109** [PMID: [28376186](#) DOI: [10.1093/jnci/djw322](#)]
- 4 **You YN**, Xing Y, Feig BW, Chang GJ, Cormier JN. Young-onset colorectal cancer: is it time to pay attention? *Arch Intern Med* 2012; **172**: 287-289 [PMID: [22157065](#) DOI: [10.1001/archinternmed.2011.602](#)]
- 5 **Kasi PM**, Shahjehan F, Cochuyt JJ, Li Z, Colibaseanu DT, Merchea A. Rising Proportion of Young Individuals With Rectal and Colon Cancer. *Clin Colorectal Cancer* 2019; **18**: e87-e95 [PMID: [30420120](#) DOI: [10.1016/j.clcc.2018.10.002](#)]
- 6 **Salih MA**, Murshid WR, Mohamed AG, Ignacio LC, de Jesus JE, Baabbad R, El Bushra HM. Risk

- factors for neural tube defects in Riyadh City, Saudi Arabia: Case-control study. *Sudan J Paediatr* 2014; **14**: 49-60 [PMID: [27493405](#)]
- 7 **Rasul KI**, Awidi AS, Mubarak AA, Al-Homsi UM. Study of colorectal cancer in Qatar. *Saudi Med J* 2001; **22**: 705-707 [PMID: [11573118](#)]
- 8 **Ibrahim H**, Mohammed A, Takai M, Usman F, Farouk Z. Fabricated or factitiously induced illness in a neonate: A case report and review of literature. *Saudi J Gastroenterol* 2008; **14**: 178-182 [DOI: [10.4103/kleuhsj.kleuhsj_80_17](#)]
- 9 **Gado A**, Ebeid B, Abdelmohsen A, Axon A. Colorectal cancer in Egypt is commoner in young people: Is this cause for alarm? *Alex J Med* 2014; **50**: 197-201 [DOI: [10.1016/j.ajme.2013.03.003](#)]
- 10 **Ibrahim AS**, Khaled HM, Mikhail NN, Baraka H, Kamel H. Cancer incidence in egypt: results of the national population-based cancer registry program. *J Cancer Epidemiol* 2014; **2014**: 437971 [PMID: [25328522](#) DOI: [10.1155/2014/437971](#)]
- 11 **Elwassief A**, Soliman A, Mostafa B, Matar E. Participation rate and results of screening colonoscopy in Egyptians with family history of colorectal cancer. *Al-Azhar Assiut Med J* 2015; **13**: 101-107 [DOI: [10.4103/azmj.azmj_131_18](#)]
- 12 **Gado AS**, Ebeid BA, Abdelmohsen AM, Gado TS, Axon AT. Quality of colonoscopy practice: a single-center experience in Egypt. *Egypt J Intern Med* 2016; **28**: 108-115 [DOI: [10.4103/1110-7782.200968](#)]
- 13 **Fayadh MH**, Sabih SA, Quadri HA. 8 years observational study on colorectal cancer in UAE. *J Coloproctology (Rio de Janeiro)* 2019; **39**: 394-395 [DOI: [10.1016/j.jcol.2019.08.003](#)]
- 14 **Almatroudi A**. The Incidence Rate of Colorectal Cancer in Saudi Arabia: An Observational Descriptive Epidemiological Analysis. *Int J Gen Med* 2020; **13**: 977-990 [PMID: [33149661](#) DOI: [10.2147/IJGM.S277272](#)]
- 15 **Ferlay J**, Colombet M, Soerjomataram I, Dyba T, Randi G, Bettio M, Gavin A, Visser O, Bray F. Cancer incidence and mortality patterns in Europe: Estimates for 40 countries and 25 major cancers in 2018. *Eur J Cancer* 2018; **103**: 356-387 [PMID: [30100160](#) DOI: [10.1016/j.ejca.2018.07.005](#)]
- 16 **Păun I**, Constantin V, Socca B, Bobic SJCeTV. The impact of environmental factors upon the incidence rate of colorectal cancer. *Ciência e Técnica Vitivinícola* 2015; **30**: 11 [DOI: [10.24264/icams-2018.i.5](#)]
- 17 **Bray F**. Transitions in human development and the global cancer burden in World Cancer Report 2014. [cited 10 January 2021]. Available from: https://www.researchgate.net/publication/288009018_Transition_in_human_development_and_the_global_cancer_burden
- 18 **Fidler MM**, Soerjomataram I, Bray F. A global view on cancer incidence and national levels of the human development index. *Int J Cancer* 2016; **139**: 2436-2446 [PMID: [27522007](#) DOI: [10.1002/ijc.30382](#)]
- 19 **Arnold M**, Abnet CC, Neale RE, Vignat J, Giovannucci EL, McGlynn KA, Bray F. Global Burden of 5 Major Types of Gastrointestinal Cancer. *Gastroenterology* 2020; **159**: 335-349.e15 [PMID: [32247694](#) DOI: [10.1053/j.gastro.2020.02.068](#)]
- 20 **Alsheridah N**, Akhtar S. Diet, obesity and colorectal carcinoma risk: results from a national cancer registry-based middle-eastern study. *BMC Cancer* 2018; **18**: 1227 [PMID: [30526552](#) DOI: [10.1186/s12885-018-5132-9](#)]
- 21 **Siegel RL**, Torre LA, Soerjomataram I, Hayes RB, Bray F, Weber TK, Jemal A. Global patterns and trends in colorectal cancer incidence in young adults. *Gut* 2019; **68**: 2179-2185 [PMID: [31488504](#) DOI: [10.1136/gutjnl-2019-319511](#)]
- 22 **Araghi M**, Soerjomataram I, Bardot A, Ferlay J, Cabasag CJ, Morrison DS, De P, Tervonen H, Walsh PM, Bucher O, Engholm G, Jackson C, McClure C, Woods RR, Saint-Jacques N, Morgan E, Ransom D, Thursfield V, Möller B, Leonfellner S, Guren MG, Bray F, Arnold M. Changes in colorectal cancer incidence in seven high-income countries: a population-based study. *Lancet Gastroenterol Hepatol* 2019; **4**: 511-518 [PMID: [31105047](#) DOI: [10.1016/S2468-1253\(19\)30147-5](#)]
- 23 **Vuik FE**, Nieuwenburg SA, Bardou M, Lansdorp-Vogelaar I, Dinis-Ribeiro M, Bento MJ, Zadnik V, Pellisé M, Esteban L, Kaminski MF, Suchanek S, Ngo O, Májek O, Leja M, Kuipers EJ, Spaander MC. Increasing incidence of colorectal cancer in young adults in Europe over the last 25 years. *Gut* 2019; **68**: 1820-1826 [PMID: [31097539](#) DOI: [10.1136/gutjnl-2018-317592](#)]



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