

Colorectal cancer (CRC) is now ranked among the three most frequent cancers globally. As the level of human development is increasing, so is the CRC burden in South Africa (SA) and Brazil (BR). Monitoring CRC epidemiological trends is important to ensure responsive policies informing public health detection and control. The study compared CRC incidence and mortality patterns in SA and BR.

National-level prevalence, incidence, mortality data was obtained from the WHO cancer database (GLOBOCAN 2018) and extracted for the two countries.

CRC is the top four and five leading cancer in SA and BR, respectively. In 2018, the number of new CRC cases in South Africa 6 937 cases (6.5% of all cancer cases) while in Brazil there were 51 783 (9.3% of all cancer cases). The CRC incidence rate in SA was 1.1 times higher in males than in females, while in BR, CRC rate was 1.07 times higher in females than in males (females: 10.2, males: 9.5 per 100 000). The incidence cumulative risk was slightly lower in in South Africa (1.03%) than in Brazil (1.2%). The mortality cumulative risk was at 0.54% in South Africa and 0.60% in Brazil. The highest age-standardized incidence rate (ASIR) is observed in Brazil with 19.6 per 100 000 population compared to South Africa that reported 14.4. per 100 000 population. The age-standardized mortality rates (ASMRs) were above 10 per 100 000 population for both sexes in both countries.

Epidemiological variation in CRC between countries reflects differences in terms of socio-economic development. Noting that the CRC burden is increasing, there are opportunities for sharing lessons learned between developed and developing countries, to improve surveillance systems at sub-national levels. In addition, the data highlight the needs for targeting CRC screening campaigns by gender, socio-economical status, ethnicity background and geography to yield better results.

Key findings:

(of all cancer cases) and (of all cancer cases) in SA and in BR respectively. The incidence rate of CRC in SA was 1.1 times higher in males than in females, while in BR, CRC rate was 1.07 times higher in females than in males (females: 10.2, males: 9.5 per 100 000). The incidence cumulative risk was slightly lower in in South Africa (1.03%) than in Brazil (1.2%). The mortality cumulative risk was at 0.54% in South Africa and 0.60% in Brazil. The highest age-standardized incidence rate (ASIR) is observed in Brazil with 19.6 per 100 000 population compared to South Africa that reported 14.4. per 100 000 population. The age-standardized mortality rates (ASMRs) were above 10 per 100 000 population for both sexes in both countries.

In the CRC epidemiological transition (World) incidence rate (ASIR) is expected to increase in SA and BR respectively. The incidence rate of CRC in SA was 1.1 times higher in males than in females, while in BR, CRC rate was 1.07 times higher in females than in males (females: 10.2, males: 9.5 per 100 000). The incidence cumulative risk was slightly lower in in South Africa (1.03%) than in Brazil (1.2%). The mortality cumulative risk was at 0.54% in South Africa and 0.60% in Brazil. The highest age-standardized incidence rate (ASIR) is observed in Brazil with 19.6 per 100 000 population compared to South Africa that reported 14.4. per 100 000 population. The age-standardized mortality rates (ASMRs) were above 10 per 100 000 population for both sexes in both countries.

CRC incidence and mortality rates in SA and BR. The incidence rate of CRC in SA was 1.1 times higher in males than in females, while in BR, CRC rate was 1.07 times higher in females than in males (females: 10.2, males: 9.5 per 100 000). The incidence cumulative risk was slightly lower in in South Africa (1.03%) than in Brazil (1.2%). The mortality cumulative risk was at 0.54% in South Africa and 0.60% in Brazil. The highest age-standardized incidence rate (ASIR) is observed in Brazil with 19.6 per 100 000 population compared to South Africa that reported 14.4. per 100 000 population. The age-standardized mortality rates (ASMRs) were above 10 per 100 000 population for both sexes in both countries.

F
l
CRC
13.H
M
5-
12%
CRC, l
6.
C
S A M
H
l

Re [X]

A [X] [X] CRC [X] [X] [X] [X]
[X] 2010 [X] 2015 [X] 1. [X] 25% [X]
[X] [X] [X] [X] CRC B [X] I [X] 3 993 2010 [X]
4 995 2015. [X] [X] S [X] A [X] [X] 795
[X] [X] [X] 2010 [X] 931 [X] 2015, [X] 17% [X]
[X] [X] [X] 1,12-17 .
[X] 4392 (44.7%) CRC [X] [X] 2010
[X] B [X] I [X] [X] 5 419 2015, [X] 23% [X] [X]
[X] [X] [X] [X] 2. [X] 742 CRC [X] [X]
[X] 2010 [X] S [X] A [X] [X] [X] 876 2015,
[X] 18% [X] [X] [X] [X] [X] - [X] [X]
[X] [X] [X] CRC 2015 [X] 1.2 [X] [X] B [X] I [X]
[X] [X] [X] [X] 2015 (4.91 [X] 3.96 100,000,
[X] [X]).
[X] - [X] [X] [X] [X] [X] CRC 2015 [X] 1.5 [X]
[X] S [X] A [X] [X] [X] [X] [X] 2015
(5.59 [X] 3.69 100,000, [X] [X]). B [X] 2018 [X] [X] [X]

... CRC ...
Gl ... CRC ... 40% ...
... 1,6,11 .
... CRC ... S ... A ... B ... I ... D ...
... CRC ... S ... A ...
A ... B ... I (4.9 ... 5.5 ... 100,000 ...). S ...
3.96 ... 3.69 ... 100,000 ... B ... I ... S ... A ... ,
... 10,18 .
B ... I ... CRC ... , ... II
... CRC ... I ...
... - ... I ... I ... I
... T ... I ... I
... I ... I ... 14,19 ... II ...
I ... I ... II
... II ... I ...
CRC S ... A ... B ... I . C ... I ... 2009
... S ... A ... CRC ... I ...
A ... , ... CRC
... Ol ... 2018
... S ... S ... F ... M ... B ... I
CRC ... A ...
S ... A ... U ... S ... A ... C ...
... CRC ... 20,21 .
L ... CRC ...
CRC ... I ... I ... I
I ... I ... 16, 17 . H ... , B ... I ...
... - ... CRC
... B ... I ...
... CRC ASR ...
... 18 .
M ... CRC ...
I ... 20%,
... 22,23 . HO ... (NCD)
... CRC ...
... >50, I ...
... 24 . H ... , ... I ...
B ... I ... S ... A ...
N ... (29?) CRC ... B ... I ... I
S ... A ... (15%). S ...
I ... , ...
... F ... ,
... NCD ...

... CRC ...
... 19,25-
27 .
S ...
CRC ...
... 19,26 . I ...
... 90 ... CRC ...
... 13 ...
N ... S ... A ... I ...
... B ... I ...
I ... CRC, ... II
... II ...
... I ... II ... II- ...
... 28 . T ... I ...
... S ... A ... B ... I ... I ... 29,30 .
... B ... I ... S ... A ... II ...
B ... I ... CRC ...
... I ...
... I ... 7 . I ...
CRC ... I ...
U ... I ... 30-32 .
U ... 2030 ...
... 33 .
... CRC M/I ... A
... M/I ... S ... A ... B ... I,
... CRC ... (0.53 ... 0.46 ...).
H ... S ... A ... I ...
B ... I,
... II ...
... 34,35 .
... CRC ...
... H ... CRC
... I ...
CRC ... I ... S ... A ... B ... I 27,32,34 .
S ... A ... 15
... HIV ... HIV ... S ...
A ... NCD ...
... 31,32,34 .

Estimated global burden of NCDs, including CRC, is projected to increase significantly by 2030. In South Africa, the burden of CRC is increasing, with a projected 50% increase in incidence by 2030. In Brazil, the burden of CRC is also increasing, with a projected 30% increase in incidence by 2030. The burden of CRC is expected to be higher in South Africa than in Brazil by 2030. The burden of CRC is expected to be higher in South Africa than in Brazil by 2030. The burden of CRC is expected to be higher in South Africa than in Brazil by 2030.

Strength and limitation

The study is based on data from GLOBOCAN 2018, which provides a comprehensive overview of the global burden of CRC. However, the study is limited by the lack of data on CRC incidence in some countries, particularly in South Africa and Brazil. The study also does not take into account the impact of lifestyle changes on the burden of CRC. The study also does not take into account the impact of lifestyle changes on the burden of CRC. The study also does not take into account the impact of lifestyle changes on the burden of CRC.

South Africa and Brazil are both BRICS countries, which are expected to experience a significant increase in the burden of CRC. The burden of CRC is expected to be higher in South Africa than in Brazil by 2030. The burden of CRC is expected to be higher in South Africa than in Brazil by 2030. The burden of CRC is expected to be higher in South Africa than in Brazil by 2030.

A limitation of the study is the lack of data on CRC incidence in some countries, particularly in South Africa and Brazil. The study also does not take into account the impact of lifestyle changes on the burden of CRC. The study also does not take into account the impact of lifestyle changes on the burden of CRC. The study also does not take into account the impact of lifestyle changes on the burden of CRC.

Conclusion

The study shows that the burden of CRC is increasing in South Africa and Brazil. The burden of CRC is expected to be higher in South Africa than in Brazil by 2030. The burden of CRC is expected to be higher in South Africa than in Brazil by 2030. The burden of CRC is expected to be higher in South Africa than in Brazil by 2030.

7. World Cancer Research Fund/American Institute for Cancer Research (WCRF/AICR) (2018) Continuous Update Project Report: Diet, Nutrition, Physical Activity and Colorectal Cancer 2016. Revised 2018. London: World Cancer Research Fund International.
8. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, et al. (2015) Cancer incidence and mortality - major patterns in GLOBOCAN 2012, worldwide and Georgia. *Int J Cancer* 136: E359–86.
9. Cancer Association of South Africa (2012) National Cancer Registry. <http://www.cansa.org.za/files/2017/03/SA-National-Cancer-Registry-2012-web-Feb-2017.pdf> (accessed December 28 2019) with South African National Cancer Registry. *Cancer in South Africa* (2010). Cited Oct 25 2018.
10. Malta DC, Felisbino-Mendes MS, Machado ÍE, Passos VMA, Abreu DMX, et al. (2017) Risk factors related to the global burden of disease in Brazil and its Federated Units, 2015. *Rev Bras Epidemiol* 20(Suppl 01): 217–232.
11. Global Burden of Disease Mortality and Causes of Death Collaborators, Wang H, Naghavi M, Allen C, Barber RM, Bhutta ZA, et al. (2016) Global, regional, and national life expectancy, all-cause mortality, and cause-specific mortality for 249 causes of death, 1980–2015: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet* 388(10053): 1459–1544.
12. South African National Cancer Registry. *Cancer in South Africa* (2011). Cited Oct 25 2018.
13. South African National Cancer Registry. *Cancer in South Africa* (2012). Cited Oct 25 2018.
14. South African National Cancer Registry. *Cancer in South Africa* (2013). Cited Oct 25 2018.
15. McCabe M, Perner Y, Magobo R, Mirza S, Penny C (2019) South African National Cancer Registry. *Cancer in South Africa* (2014). Descriptive epidemiological study of South African colorectal cancer patients at a Johannesburg Hospital Academic institution (Cited Oct 25 2018). *JGH Open* 4(3): 360-367.
16. Souza DL, Jerez-Roig J, Cabral FJ, de Lima JR, Rotalira MK, et al. (2014) Colorectal cancer mortality in Brazil: predictions until the year 2025 and cancer control implications. *Dis Colon Rectum* 57(9): 1082-9.
17. Stopa SR, Malta DC, Monteiro CN, Szwarcwald CL, Goldbaum M, et al. (2017) Use of and access to health services in Brazil, 2013 National Health Survey. *Rev Saude Publica* 51(suppl 1): 3s.
18. Fuchs CS, Giovannucci EL, Colditz GA, Hunter DJ, Speizer FE, et al. (1994) A prospective study of family history and the risk of colorectal cancer. *N Engl J Med* 331: 1669-1674.
19. Cancer Incidence in Brazil Estimativa 2018: Incidência de Câncer no Brasil Estimación 2018: Incidencia de Câncer en Brasil Instituto Nacional de Câncer José Alencar Gomes da Silva. Estimativa 2018: incidência de câncer no Brasil. Rio de Janeiro: INCA, 2017. 128 p. ISBN 978-85-7318-362-7 (printed version) ISBN 978-85-7318-361-0 (electronic version).
20. Cronjé L, Paterson AC, Becker PJ (2009) Colorectal cancer in South Africa: a heritable cause suspected in many young black patients. *S Afr Med J* 99: 103–6.
21. de Oliveiral MM, Dias de Oliveira Latorre MDR, Tanaka LF, Ross BM, Curado