Cancer patterns and trends in Central and South America


Cancer Prevention Recommendations for Latin America and the Caribbean: Scoping Meeting. Washington, DC. 24-25 April 2017
Overview

- Culture
- Race/ethnicity
- Geography
- Diets
- Causes of mortality
- Health care systems
Drivers of the epidemiological transition

Population growth

Increase in population since 1990, projected from 2015 (millions)

Drivers of the epidemiological transition

Life expectancy

Drivers of the epidemiological transition

Fertility rate, total (births per woman)

1960

2015

Drivers of the epidemiological transition

Population ageing

Population pyramids

1950

2000

2050

Population Division, DESA, United Nations
Drivers of the epidemiological transition

Urban and rural population

Epidemiologic transition in Central and South America and the Caribbean

- ↓ Mortality due to communicable, maternal, and perinatal diseases
- ↑ Mortality due to non-communicable diseases (NCDs), including cancer
  - NCDs accounted for 50–87% of total deaths in 2008
    - Cancer accounted for 8–25% of the total NCD burden
  - Significant economic impact for governments

Cancer estimates for Central and South America

- 2012 estimations:
  - 1 million new cancer cases & 550,000 cancer deaths
- 2030 estimations:
  - 1.7 million new cases & 1 million cancer deaths

http://globocan.iarc.fr/
Cancer in Central and South America

Objective

To provide an overview of current geographic patterns and trends of cancer incidence and mortality in the Central and South American region (including Cuba) in the 21st century.
Methodology
Methodology

Cancer Registry Data Contributors

- National coverage by one cancer registry
- 2 or more regional cancer registries
- 1 regional cancer registry
- 1 regional pathology-based cancer registry
- No data
Methodology

National Mortality Data (WHO)
Methodology

- Human development index (HDI), 2010
  - Low (HDI≤0.46)
  - Medium (0.46<HDI≤0.63)
  - High (0.63<HDI≤0.75)
  - Very high (all remaining countries)

- Data analysis
  - Estimated World population age-standardized incidence (ASR) and mortality (ASMR) rates per 100,000 person-years using the direct method
  - National ASRs are aggregated data from the available cancer registries using a weighted average of local rates

(1) United Nations Development Programme and the Institut national de la statistique et des études économique
(2) Doll R, et al. CL5-I. 1966
Cancer Rankings using age-standardized (World) rates

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HDI, Human development index
VH, very high (HDI>0.75)
H, high (0.63<HDI≤0.75)
M, medium (0.46<HDI≤0.63)
Results

Sierra et al. http://dx.doi.org/10.1016/j.canep.2016.07.013
Cancer Rankings
## Cancer incidence* among males (2003-07)

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*Age-standardized (World) rate per 100,000
† Incidence rates were estimated using aggregated data from regional cancer registries
HDI, Human development index; VH, very high (HDI>0.75); H, high (0.63<HDI≤0.75); M, medium (0.46<HDI≤0.63)
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*Age-standardized (World) rate per 100,000
HDI, Human development index; VH, very high (HDI>0.75); H, high (0.63<HDI≤0.75); M, medium (0.46<HDI≤0.63)
# Cancer incidence* among females (2003-07)

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*Age-standardized (World) rate per 100,000
† Incidence rates were estimated using aggregated data from regional cancer registries
HDI, Human development index; VH, very high (HDI>0.75); H, high (0.63<HDI≤0.75); M, medium (0.46<HDI≤0.75)
## Cancer mortality* among females (2003-07)

### CENTRAL AMERICA

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<th>Colorectal</th>
<th>Liver</th>
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<th>Pancreas</th>
<th>Ovary</th>
<th>Gallbladder</th>
<th>Brain, CNS</th>
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### SOUTH AMERICA

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Cancer Trends in Selected Countries

Trends in age-standardized (World) rates of prostate cancer

Incidence

Mortality

* Regional registries

Trends in age-standardized (World) rates of female breast cancer

**Incidence**

- USA
- Brazil
- Spain
- Colombia
- Ecuador
- Costa Rica

**Mortality**

- Argentina
- Cuba
- USA
- Spain
- Brazil
- Chile
- Colombia
- Mexico

* Regional registries

Trends in age-standardized (World) incidence rates of cervical cancer

![Graph showing trends in cervical cancer incidence rates](image)

* Regional registries

Trends in age-standardized (World) mortality rates of lung cancer

Males

Females
Trends in age-standardized (World) mortality rates of stomach cancer

Males

Females

Trends in age-standardized (World) mortality rates of colorectal cancer

**Males**

- Spain
- Argentina
- USA
- Cuba
- Costa Rica
- Brazil
- Colombia
- Mexico

**Females**

- USA
- Cuba
- Spain
- Argentina
- Chile
- Costa Rica
- Brazil
- Colombia
- Mexico

Cancer Risk Factors
Major cancer risk factors in Central and South America

Lifestyle

**Tobacco**
- 26% of all CA deaths
- 84% of all lung CA deaths

**Alcohol**

**Overweight**
- 15%* all new CA cases

**Obesity**

**Diet**

- Red meat, processed meat
- Dietary fiber (protective)

*High-BMI-related cancers (oesophageal adenocarcinoma, colorectum, pancreas, kidney, gallbladder, postmenopausal-breast, corpus uteri, and ovary)

~ 1/3 of all cancer cases could be prevented by avoiding lifestyle risk factors
**Major cancer risk factors in Central and South America**

**Infections**

- *Helicobacter pylori (H. pylori)*
- Human papillomavirus (HPV)
- Hepatitis C virus (HCV)
- Hepatitis B virus (HBV)

18% of all new CA cases

---

Cervix cancer incident cases attributed to HPV in 2012

ASRs per 100,000

- ASR < 10
- ASR in 10 - 15
- ASR in 15 - 20
- ASR in 20 - 25
- ASR in 25 - 30
- ASR > 30

Other potential risk factors associated with an increased risk of cancer in Central and South America

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<td>b-carotene supplements (high doses)</td>
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<td>Very hot beverages (&gt;65° C)*</td>
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*Probably carcinogenic to humans
**Not classified by the IARC Monographs Programme
Conclusions
Conclusions

- Central and South America carries a double-burden of cancer, with elevated rates of infection- and lifestyle-related cancers

- Regional differences in cancer incidence and mortality patterns and trends may reflect:
  - Differences across HDI levels
  - Exposure to common risk factors
    - H. pylori infection, HPV, smoking, alcohol use
  - Detection practices
  - Deficiencies in prevention, early detection and/or disease management
Conclusions

- Opportunities to reduce the cancer burden in the future through resource-dependent interventions
  - Implementation and/or strengthening of tobacco and alcohol control policies
  - Vaccination against HPV
  - Self collection based HPV testing for cervical cancer

- Improvement of the quality and coverage of cancer registration is crucial to guide and evaluate future cancer control policies and programmes
  - Lack of national coverage (except in Costa Rica and Uruguay)
Taking action

Map of IARC Regional Hubs

IARC Regional Hubs
- South, East, and South-Eastern Asia
- Sub-Saharan Africa
- North Africa, Central and West Asia
- Latin America
- Caribbean
- Pacific Islands
- Not applicable

Data source: GICR
Map production: IARC
World Health Organization

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.
Acknowledgements

IARC Fellowship

- This work was undertaken during the tenure of a Postdoctoral Fellowship to Dr Mónica S. Sierra from The International Agency for Research on Cancer, partially supported by the European Commission FP7 Marie Curie Actions – People – Co-funding of regional, national and international programmes (COFUND)

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http://gco.iarc.fr/resources/csa.php
Burden of cancer in the Caribbean

Caribbean ASR (W)

Male
- Prostate
- Breast
- Lung
- Colorectum
- Cervix uteri
- Stomach
- Liver
- Corpus uteri
- Bladder
- Larynx
- Non-Hodgkin lymphoma
- Leukaemia
- Pancreas
- Lip, oral cavity
- Brain, nervous system
- Oesophagus
- Thyroid
- Ovary
- Other pharynx
- Kidney

Female

Incidence
Mortality

GLOBOCAN 2012 (IARC) (23.4.2017)
Age-adjusted prostate cancer mortality rates (per 100,000), males — Caribbean Region, 2003–2013

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Data source: CARPHA, NCHS
Map production: IARC
World Health Organization
Age-adjusted breast cancer mortality rates (per 100,000), females — Caribbean Region, 2003–2013

Data source: CARPHA, NCHS
Map production: IARC
World Health Organization
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Razzaghi, MMWR. 2016 / 65(49);1395–1400
Age-adjusted **cervical** cancer mortality rates (per 100,000), females — Caribbean Region, 2003–2013

Razzaghi, MMWR. 2016 / 65(49);1395–1400
Age-adjusted lung cancer mortality rates (per 100,000), males — Caribbean Region, 2003–2013

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Data source: CARPHA, NOHS
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World Health Organization
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