The Global Cancer Burden in 2018

- framing global cancer control
IARC – an international effort to combat cancer

- IARC is the definitive source for cancer data worldwide, accommodating the growing needs and demands of a diverse and expanding range of users of such information.

- Aims to ensure the progressive and sustainable development of quality-assured population-based cancer registries in every country of the world as a key driver of cancer control and cancer research.
IARC uses a data-based approach to build-up the estimates.

The lack of availability and quality of cancer incidence and mortality data in LMIC remains a major challenge.

Launched in 2012, the Global Initiative for Cancer Registry Development (GICR) is a partnership of leading cancer organizations seeking to address such inequities.

- **2011-17**
  - 80 in-country consultancies
  - 64 regional courses delivered
  - 22 agreements with countries

- **2018-2025**
  - Provide measurable improvements in cancer registry data in 30 countries by 2030

Presented for 185 countries of the world, for 36 cancer types and for all cancers combined, by age and sex.

Results available through IARC’s Global Cancer Observatory (GCO) (http://gco.iarc.fr) and a peer-reviewed article in CA: A Cancer Journal for Clinicians.
Incidence: Sources and Methods

Incidence methods
- **Blue**: National (or local with coverage > than 50%) rates projected to 2018
- **Green**: Most recent rates applied to 2018 population
- **Yellow**: Estimated from national mortality estimates by modelling
- **Orange**: "All sites" estimates from neighbouring countries partitioned using frequency data
- **Red**: No data; the rates are those of neighbouring countries or registries in the same area
- **Gray**: No data

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.

Data source: Globocan 2018
Map production: CSU
World Health Organization

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Global Cancer Burden 2018

Incidence
- Africa: 5.8%
- Americas: 21.0%
- Asia: 57.3%
- Europe: 23.4%
- Oceania: 1.4%

18.1 million new cases

Mortality
- Africa: 7.3%
- Americas: 14.4%
- Asia: 39.7%
- Europe: 20.3%
- Oceania: 0.7%

9.6 million deaths

Prevalence (5 years)
- Africa: 4.4%
- Americas: 26.1%
- Asia: 39.7%
- Europe: 27.7%
- Oceania: 2.1%

43.8 million persons
Top five cancers: incidence, mortality and 5-year prevalence 2018

Incidence
- Lung: 53.9%
- Breast: 46.1%
- Colorectum: 5.0%
- Prostate: 0.8%
- Stomach: 0.4%
- Total: 18.1 million new cases

Mortality
- Lung: 49.4%
- Colorectum: 50.6%
- Stomach: 0.6%
- Liver: 0.4%
- Breast: 0.3%
- Total: 9.6 million deaths

Prevalence (5 years)
- Breast: 55.5%
- Colorectum: 44.5%
- Prostate: 0.4%
- Lung: 0.3%
- Thyroid: 0.2%
- Total: 43.8 million persons
Human Development Index (HDI) 1990-2015

1990

Human Development Index 1990

- Very High HDI
- High HDI
- Medium HDI
- Low HDI

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Data source: UNDP
Map production: IARC
World Health Organization

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Cancer profile by HDI

Very High HDI
- Breast
- Colorectum
- Lung
- Prostate
- Bladder

High HDI
- Lung
- Colorectum
- Breast
- Stomach
- Liver

Medium HDI
- Breast
- Lung
- Cervix uteri
- Colorectum
- Lip, oral cavity

Low HDI
- Breast
- Cervix uteri
- Prostate
- Colorectum
- Liver

New cases in 2018 (thousands)
- Males
- Females

.png
Most common cancer by country, females 2018

Incidence, females
- Breast (154)
- Cervix uteri (28)
- Liver (1)
- Lung (1)
- Thyroid (1)

No data
Not applicable

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Data source: Globocan 2018
Map production: IARC
World Health Organization

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Cervical cancer: incidence and mortality rates

- **Swaziland**: 43.1 incidence, 20.0 mortality
- **Eastern Africa**: 40.1 incidence, 30.0 mortality
- **Western Africa**: 29.6 incidence, 23.0 mortality
- **Melanesia**: 27.7 incidence, 19.0 mortality
- **Middle Africa**: 26.8 incidence, 21.1 mortality
- **South-Eastern Asia**: 17.2 incidence, 10.0 mortality
- **Eastern Europe**: 16.0 incidence, 6.1 mortality
- **Caribbean**: 15.5 incidence, 8.5 mortality
- **South America**: 15.2 incidence, 7.1 mortality
- **Micronesia/Polynesia**: 14.2 incidence, 6.3 mortality
- **Central America**: 13.0 incidence, 7.0 mortality
- **South Central Asia**: 13.0 incidence, 8.2 mortality
- **Eastern Asia**: 10.9 incidence, 4.1 mortality
- **Northern Europe**: 9.5 incidence, 2.1 mortality
- **Southern Europe**: 7.8 incidence, 2.2 mortality
- **Northern Africa**: 7.2 incidence, 5.1 mortality
- **Western Europe**: 6.8 incidence, 2.1 mortality
- **North America**: 6.4 incidence, 1.9 mortality
- **Australia/New Zealand**: 6.0 incidence, 1.7 mortality
- **Western Asia**: 4.1 incidence, 2.5 mortality

Age-standardized (W) rate per 100,000
Estimated new cases both sexes, ages <50 2018

- Breast: 644,753 (19.9%)
- Thyroid: 277,907 (8.6%)
- Cervix uteri: 253,267 (7.8%)
- Colorectum: 184,434 (5.7%)
- Leukaemia: 169,044 (5.2%)
- Other cancers: 1,718,502 (52.9%)
‘..rather than increasing investments in the production and dissemination of global estimates, increased domestic and international support is urgently needed [...] in LMIC to develop and sustain institutional knowledge and skills for data generation, analysis, interpretation, and translation.’
Thank you

brayf@iarc.fr
Using Old and New Indicators to Accelerate Action in Cancer Prevention

International Agency for Research on Cancer Lyon, France

Isabelle Soerjomataram
Section Cancer Surveillance

WCC, Kuala Lumpur 2018
Global Cancer Burden Today

**Incidence**
- Asia: 48.4%
- Americas: 21.0%
- Africa: 5.8%
- Europe: 23.4%
- Oceania: 1.4%

- 18.1 million new cases

**Mortality**
- Asia: 57.3%
- Americas: 14.4%
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**Prevalence (5 years)**
- Americas: 26.1%
- Europe: 27.7%
- Africa: 4.4%
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- Oceania: 2.1%

- 43.8 million persons
Global Cancer Burden Today

World, both sexes

Incidence
- Lung: 46.1%
- Breast: 53.9%
- Colorectum: 18.1 million new cases

Mortality
- Lung: 50.6%
- Colorectum: 49.4%
- Stomach: 9.6 million deaths

Prevalence (5 years)
- Breast: 44.5%
- Colorectum: 55.5%
- Prostate: 43.8 million persons
Cancer Incidence Over Time, Lung Cancer

- Australia*
- Iceland
- Netherlands

- United Kingdom
- USA: white*
- USA: Black*

Age-standardized rate (per 100,000)

Year

Male     Female
Cancer Incidence Over Time, Cervix - Breast

- Colombia
- Germany*
- India*
- Slovakia
- Thailand*
- USA: black*

Age-standardized rate (W) per 100,000

Year

Cervix uteri
Breast
New Indicators: Monitoring SDG Goals

1. No Poverty
2. Zero Hunger
3. Good Health and Well-being
4. Quality Education
5. Gender Equality
6. Clean Water and Sanitation
7. Affordable and Clean Energy
8. Decent Work and Economic Growth
9. Industry, Innovation, and Infrastructure
10. Reduced Inequalities
11. Sustainable Cities and Communities
12. Responsible Consumption and Production
13. Climate Action
14. Life Below Water
15. Life on Land
16. Peace, Justice, and Strong Institutions
17. Partnerships for the Goals
Goal 3: Ensure healthy lives & well-being

3 GOOD HEALTH AND WELL-BEING

Facts and figures

Goal 3 targets

Links

- By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births

- By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births

- By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases

- By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being
Premature Mortality - Cancer: a Transition

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Data source: GHE
Map production: IARC
World Health Organization

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Premature Mortality Cancer: Reaching the Goal?

Change in risk of dying, 30-69 years old
2000 to 2015

Cancer

Low / Medium HDI

High / Very High HDI

Risk of dying (%)

India, Morocco, Philippines, South Africa, Uganda

Sweden, Brazil, USA, China, Russian Federation

International Agen
World Health Organization
Premature Mortality Cancer: Reaching the Goal?

Change in risk of dying, 30-69 years old
2000 to 2015

Cancer

Low / Medium HDI

High / Very High HDI

Risk of dying (%)
Premature Mortality Cancer: Reaching the Goal?

Change in risk of dying, 30-69 years old
2000 to 2015

Cancer

Low / Medium HDI

High / Very High HDI

Risk of dying (%)

Country
India
Morocco
Philippines
South Africa
Uganda
Sweden
Brazil
USA
China
Russian Federation

Risk of dying (2000)

Risk of dying (2013)

International Agency
World Health Organization
An Economic Argument: SDG targets

Billions: 240,000,000,000
An Economic Argument: SDG targets

Cao et al, submitted

Pearce et al Can Epid
Acknowledgement

- Mathieu Laverssane
- Bochen CAO
- GCO – Population-based Cancer Registries
  http://gco.iarc.fr
Behind the GLOBOCAN estimates in the Asia Pacific: developing surveillance capacity through the IARC Regional Hub

International Agency for Research on Cancer
Lyon, France

Les Mery

03 October 2018
World Cancer Congress
Kalua Lumper, Malaysia
LATEST GLOBAL CANCER DATA

GLOBOCAN 2018

ACCESSIBLE ONLINE AS PART OF THE IARC GLOBAL CANCER OBSERVATORY
Data Availability, 2018

Incidence availability (Aug 18)
- High Quality PBCR (69)
- PBCR (62)
- Registration activities (41)
- No information (30)

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Data source: GICR
Map production: IARC
World Health Organization

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So What? Why do investments in cancer data provide .....
So What? Why do investments in cancer data provide ..... 

- Basis for planning and evaluation of cancer control programmes
  - Resources can be allocated to where they are most needed
  - Critical to measure and evaluate progress

- Information drives action in improvements in health care systems and policy
  - Provides evidence to highlight gaps, inequities
  - Can identify special populations to develop targeted programmes
The challenge in advancing support to achieve high quality PBCR data ….

- High demand for cancer registry support
- Need for sustainable solutions
- Ensure a linkage between PBCRs and key stakeholders in cancer control
The challenge in advancing support to achieve high quality PBCR data ....

- High demand for cancer registry support

- Need for sustainable solutions

- Ensure a linkage between PBCRs and key stakeholders in cancer control

- Partnerships, shared workload, coordination, educational resources

- Local leaders, networks, clear benefit

- Relevant + timely products, knowledge translation tools, investment in relationships
Global Initiative for Cancer Registry Development (GICR)
IARC Regional Hubs: Functions

- Delivery of basic / advanced courses
- Development of accompanying resources
- Foster relationships between disciplines
- Provide information on upcoming activities

- Site visits to review practices
- Consultancy and mentorship to resolve specific issues
- Support cancer control interventions
- Stimulate research

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ASIA-PACIFIC CANCER LEADERS’ SUMMIT

International Agency for Research on Cancer

World Health Organization

LIICC

Cancer Council Queensland

APOCP

IACR

Griffith University

Tourism and Events Queensland

International Agency for Research on Cancer

World Health Organization
Development of the Pacific Island Hub

**Oct 2014**
* Preliminary discussions with regional partners during the World Cancer Congress, in Melbourne, AUS

**April 2016**
* Cancer Registration workshop, Asian Pacific Org Cancer Prevention in Brisbane, AUS
* Site visit to Fiji

**May 2017**
* Investment provided by the Australian government as seed funding
Endorsement for the Hub endorsed by the Heads of Health Meeting (April 2018)

Advisory Committee launched
- Adherence to Pacific Islands governance model

WHO Western Pacific Regional Office Division of Pacific Technical Support (WPRO DPS) and Pacific Community (SPC) joint commitment re: Hub location and operations

Initial list of GICR Partner Countries
- Fiji; New Caledonia; Papua New Guinea; Samoa; Solomon Islands; and Tonga
Kalua Lumpur Meeting, Oct 2018

- Financial and logistical support from Cancer Council Australia and UICC, respectfully
Opportunities through the GICR .....
GICRNet Trainers:
Ms. Gladys Chebet Chesumbai
– Eldoret Cancer Registry (Kenya) / African Cancer Registry Network

- CanReg technical support provided to South Africa, Seychelles, Namibia, Ethiopia, Tanzania, Uganda, and Kenya
- Trained students from Nigeria, Zambia, Ghana, Mozambique, Malawi and Mauritius
GICRNet

- ‘train the trainer’ model to form subject specific networks to deliver regional courses and provide support to registries

- Course material will be linked to joint IARC and IACR publications

- Designated leads will facilitate each group of trainers to track progress and ensure coordination
# Case study of capacity building through the GICR – Myanmar

<table>
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<th>GICR Phases</th>
<th>Key Activities</th>
<th>IARC Partners*</th>
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</table>
| **COUNTRY ASSESSMENT** | - Discussions with local contacts on needs – leading to a course on basic cancer registration in Yangon  
- Installation and customization of IARC CanReg5 software  
- Agreement with the Ministry of Health and Sports (MoH) to launch pilot cancer registry, Naypyidaw General Hospital | - IARC Mumbai Hub  
- National Cancer Institute (Thailand)  
- Myanmar MoH  
- International Association of Cancer Registries |
| **SITE VISIT**       | - ImPACT Mission to review cancer control services in Mandalay, Naypyidaw and Yangon  
- Debriefing with senior MoH staff to refine recommendations | - International Atomic Energy Agency  
- World Health Organization |
| **DIRECTED SUPPORT** | - Engagement with surveillance leaders to establish a plan for PBCR**, Myanmar Cancer Control Leadership Forum  
- Elaboration of cancer registry plan, including costing and milestones at the National Cancer Control Programme Meeting  
- Naypyidaw PBCR staff selected as IARC ‘50 for 50’ Programme | - National Cancer Institute (US)  
- National Cancer Centre (Japan) / IARC GICR Collaborating Centre |
|                      | **2016** - IARC – MoH Collaborative Research Agreement finalized to become a **GICR Partner Country**  
- Delivery of a national training course  
- Revisions to CanReg5 to include new fields and local language  
- Naypyidaw PBCR staff training at IARC Summer School | |
| **GENERATE EVIDENCE** | **2018 – 2020 (PLANNED)** - Mentorship exchange with IARC - GICR Collaborating Centres  
- Initial data quality review of Naypyidaw PBCR  
- Networked version of CanReg5 system to other centres – Mandalay, Yangon and Taunhhyi  
- Assessment of feasibility for the implementation of PBCRs in other regions of the country | - National Cancer Institute (Thailand)  
- International Union for Cancer Control  
- Bloomberg Philanthropies  
- Vital Strategies |

* Listed in chronological order by involvement; ** Population-Based Cancer Registry
Cancer Registration Principle and Methods - Training toolkit

General

This training toolkit is intended to provide comprehensive materials that will allow for designing and organizing training workshops for all stakeholders in cancer registration management and processes.

Training material

Material to be used face-to-face session. For each Module:
- Cover sheet: target audiences, learning objectives, example of organisation for a training session
- Content: reference to book chapter; other references
- Training material: slides, exercises & other learning activities

- Module 1 - Introduction
- Module 2 - Planning and management
- Module 3 - Confidentiality and ethical aspects
Summary:

- GICR – all about people
  
  1 Empower local leaders
  
  2 Support countries
  
  3 Save lives
Regional Partners

Joanne Aitken, Cancer Council Queensland
Sunia Foliaki, Massey University

David Roder, University of South Australia
Diana Sarfati, Ottago University

Wendy Snowdon, WHO (Fiji)
Paula Vivili, SPC
Thank you!

Email: meryl@iarc.fr
Website: http://gicr.iarc.fr
Measuring cancer among Indigenous peoples globally

Prof Diana Sarfati
Indigenous peoples

• more than 370 million indigenous people in 70 countries worldwide.
• These are hugely diverse populations
• Indigenous peoples are the first peoples of a country or region
• Distinct traditions, and social, cultural, economic and/or political characteristics.
Is cancer a problem for Indigenous populations?
Is cancer a problem for Indigenous peoples?

Cancer incidence in indigenous people in Australia, New Zealand, Canada, and the USA: a comparative population-based study

Lancet Oncology, 2015
Commentary

Measuring cancer in indigenous populations

Diana Sarfati, MBChB, MPH, PhD a,*, Gail Garvey, MEd, PhD b, Bridget Robson, BA, DPH c, Suzanne Moore, BHSc, MPH, PhD b, Ruth Cunningham, MBChB, MPH, PhD a, Diana Withrow, MSc, PhD d, Kalinda Griffiths, BMSc, MPH, PhD e, Nadine R. Caron, MD, MPH f, Freddie Bray, BSc(Hons), MSc, PhD g

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ABSTRACT

It is estimated that there are 370 million indigenous peoples in 90 countries globally. Indigenous peoples generally face substantial disadvantage and poorer health status compared with nonindigenous peoples. Population-level cancer surveillance provides data to set priorities, inform policies, and monitor progress over time. Measuring the cancer burden of vulnerable subpopulations, particularly in indigenous peoples, is problematic. There are a number of practical and methodological issues potentially resulting in substantial underestimation of cancer incidence and mortality rates, and biased survival rates, among indigenous peoples. This, in turn, may result in a de-prioritization of cancer-related programs and policies among these populations. This commentary describes key issues relating to cancer surveillance among
The problem:
Cancer data relating to Indigenous peoples tend to be absent making Indigenous peoples statistically invisible, or of poor quality resulting in underestimation of their cancer burden.
Big biases exist

1. Suboptimal identification of Indigenous people in health data
2. Numerator-denominator bias
3. Problems with data linkage

Suboptimal identification of Indigenous populations in health data

• Few countries systematically and consistently collect Indigenous identifiers.
• Cancer registries usually identify Indigenous peoples through linkage with other data, typically health service data.
• Quality of those data are often poor.
• Where numerator and denominator data come from different sources
  – Numerator from health service or mortality records
  – Denominator from Census data
• Such biases have been shown to result in substantial underestimation of cancer incidence and mortality rates in several jurisdictions (20-50%)
Cancer incidence rates of American Indians before and after linkage (1988-93, per 100,000)

Cancer incidence rates of American Indians before and after linkage (1988-93, per 100,000)

What to do about ND bias?

- Data linkage so numerator and denominator are consistent (link cancer data with census)
- Data linkage to improve comparability (IHS approach)
- Careful consideration of appropriate denominator
- Use adjustment factors to account for undercounts
- Improve data collection in numerator data

Data linkage

- Poorer data linkage
- Change of name, address, dob means probabilistic linkage less likely
- Results in artificially increased survival rates
Data linkage examples

**AIHW, National Best Practice Guidelines for data linkage activities relating to Aboriginal and Torres Strait Island people, 2012**

Biases

• Typically:
  – Underestimation of incidence and mortality
  – Overestimation of survival

• De-prioritisation of cancer for Indigenous populations

Governance and self-determination by Indigenous people is of paramount importance.

Self-identity vs identification (through blood quantum, tribal affiliation etc)

Illegal in some countries (France, Scandinavia)
What to do?

• Led by Indigenous peoples, with data governance procedures set in place
• Proactive at global level to ensure data relating to Indigenous peoples are available
• High quality Indigenous identifiers in Census, vital statistics, health-service related data
• Careful consideration and reporting of methods
• Identify and mitigate reporting biases
• If these not in place, treat estimates with healthy scepticism

Indigenous data

United Nations Declaration on the Rights of Indigenous Peoples

Improving the health of Indigenous people globally

I wish to thank the organizing committee of the Indigenous Peoples and Cancer Symposium for their open letter regarding improving the health of indigenous people globally.

Tracking health inequities—avoidable or remediable differences among groups of people, whether these groups are defined socially, ethnically, economically, or geographically—is a major challenge facing the global health community. In the decade since the adoption of the United Nations Declaration on the Rights of Indigenous Peoples by the General Assembly, progress on the health of indigenous peoples has been too slow. Indigenous peoples are at higher risk for cancers and other diseases and have worse health outcomes than non-indigenous groups. But this is only the beginning of our understanding of the problem. Appropriate inclusion and classification of Indigenous peoples in information systems, including cancer registries, has been insufficient.

2007

Lancet Oncology, 2018
Cancer Care at a Crossroads Conference

31 January - 1 February 2019
Te Papa, Wellington, New Zealand

Bringing together the brightest minds and most influential personalities from across the cancer control continuum to address New Zealand's cancer care challenges

Read more about the outstanding line-up of international and national speakers at:

otago.ac.nz/cancer-care