



FACULTY OF HEALTH SCIENCES

UNIVERSITY OF CAPE TOWN



Cervical cancer in the 21st Century

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Hygieia: Daughter of Aesclepius (God of medicine
And Epione (Goddess of Healing)

Introduction

- Cervical cancer: a disease of *inequity* of access to prevention, diagnosis and treatment – why is this so?
- Gross inequity throughout the world
- The top fifth of the world's people in the richest countries enjoy 82% of the expanding export trade and 68% of foreign direct investment – *the bottom fifth around 1%*
- In 1999 the developing world spent US\$13 on debt repayment for US\$1 received in grants
- 20% of people living in developed countries consume 86% of the world's goods
- Many countries spend more on military than on health and education

Introduction

Gross national income per capita in nominal US\$

Year	Richest countries*	Poorest Countries*	Ratio
1980	US\$ 11 840	US\$ 196	60
2000	US\$ 31 522	US\$ 274	115
2005	US\$ 40 730	US\$ 334	122

* World Bank's World Development Reports from 1982, 2002 and 2007

Global determinants of health*

- The global determinants of health include the *distribution and use of power* expressed in (among others):
 - Global governance
 - Economic crises and austerity measures
 - Knowledge and intellectual property
 - Foreign investment treaties
 - Food security
 - Transnational corporate activity
 - Migration
 - Violent conflict

*Ottersen et al. The Lancet –University of Oslo Commission on Global Governance for health. The political origins of health inequity: prospects for change. Lancet February 11th, 2014

Adverse effects of global political determinants of health

- Ottersen et al* found five dysfunctions that enable the adverse effects of global political determinants of health:
 - Lack of participation in health planning by civil society, health experts and marginalised groups
 - Weak accountability mechanisms
 - Institutional inability to respond to changing needs in society
 - Inadequate policy space for health care planning, triage and expenditure
 - Absence of interaction internationally
 - *Well illustrated by the events around the Ebola outbreak*

*Lancet 2014

Adverse effects of global health inequity

- *‘Although the poorest population groups in the poorest countries are left with the heaviest burden of health risks and disease, the fact that people’s life chances differ so widely is not simply a problem of poverty, but one of socioeconomic inequality.....it is now well established that the more unequal the society, the worse the outcomes for all – including those at the top’

*Wilkinson R et al. The spirit level: why equality is better for everyone. London: Penguin books. 2010

Health Inequity

- Health inequities are defined as ‘avoidable inequalities in health between people within and between countries...’
- Obvious examples:
 - Infant mortality rate (number of live births surviving first year of life)
 - 2 /1000 Iceland
 - 120/ 1000 in Mozambique
 - Lifetime risk of maternal death
 - 1 in 17 400 in Sweden
 - 1 in 8 in Afghanistan
- The poorest of the poor have the worst health

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Cancer health care disparities

- National Cancer Institute cancer definition of health disparities is quoted as follows*:
 - Disparities or inequalities occur when members of some population groups do not enjoy the same health status as other groups
 - Disparities in cancer care are measured by:
 - Incidence (number of new cancers)
 - Mortality (number of cancer deaths)
 - Survival rates (length of survival following diagnosis of cancer)

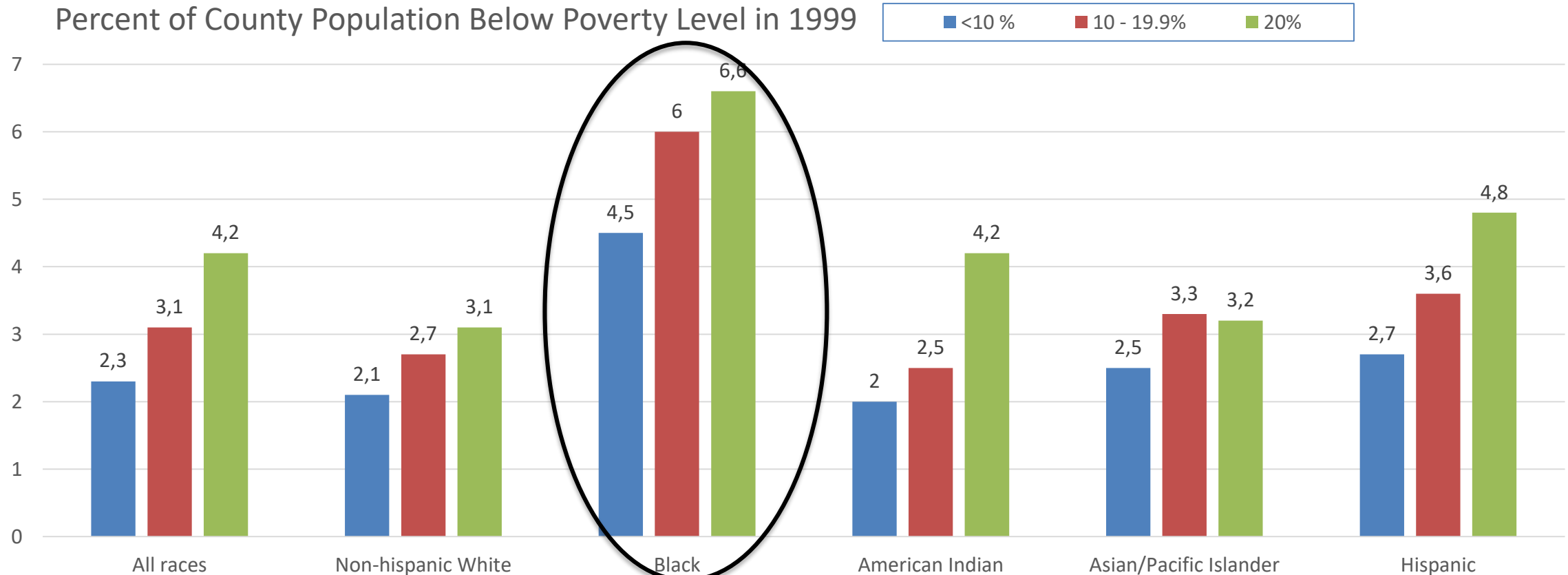
*Economic Costs of Cancer Health Disparities. Summary of meeting proceedings, National Institute of Health, December 2004

Causes of Cancer Health Disparities*

- Causes of cancer health disparities include (among others):
 - Poverty (low socio-economic status) and lack of access to health insurance
 - Decent employment
 - Culture
 - Social justice
 - Gender
 - Race
 - Ethnicity
 - Geographic location
- Poorer people present at more advanced stage of disease, have less access to diagnostic and treatment facilities and a significantly higher case to fatality rate
- Rates of disparity vary from country to country, within countries, and along the North – South divide

*Economic Costs of Cancer Health Disparities. Summary of meeting proceedings, National Institute of Health, December 2004

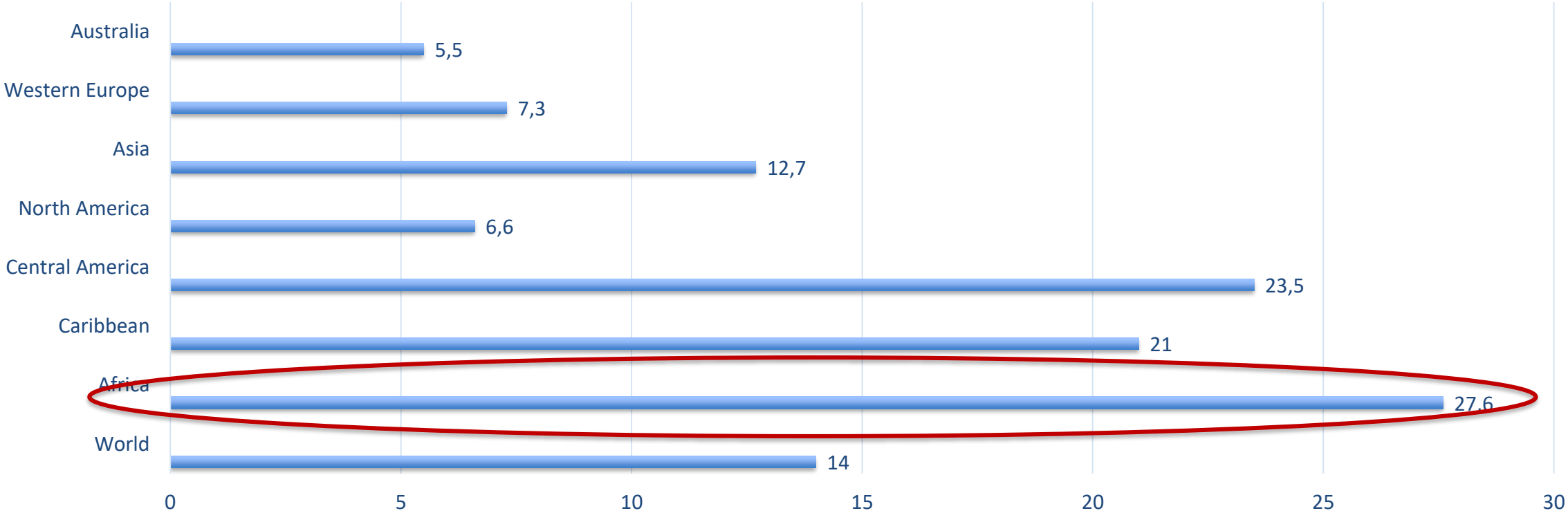
US Cervical Cancer Mortality by Race and Poverty level 1996 – 2000*



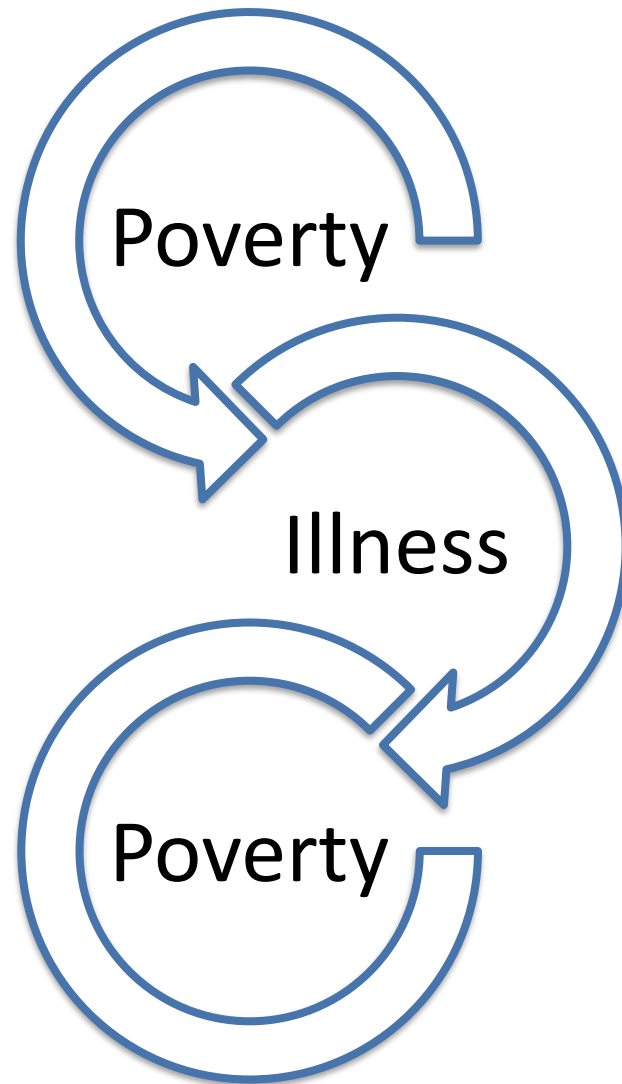
*Economic Costs of Cancer Health Disparities. Summary of meeting proceedings, National Institute of Health, December 2004

Estimated ASIR of Cervical Cancer by Region 2012*

Estimated ASIR/ 100 000 women of Cervical Cancer in Different Regions of the World – Globocan 2012







Actions required to address health inequity

- ‘Improve the conditions of daily life:
 - Circumstances in which people are born, grow, live, work and age
 - Tackle the inequitable distribution of power, money and resources globally, nationally and locally
 - Measure the problem, evaluate action, expand the knowledge base, develop a workforce that is trained in the social determinants of health, and raise public awareness about the social determinants of health’

*Commission on Social Determinants of Health: Closing the Gap: Michael Marmot (Chair)

The Abuja Declaration

- April 2001 heads of State of the African Union pledged to set a target of at least 15% of their annual budget to improve health sector
- They also requested to 'fulfil the yet to be met 0.7% of the GNP of wealthy countries' as official Development Assistance (ODA) to developing countries
- At the time the median level of general health expenditure from domestic resources was \$10 with a range from \$0.38 to \$380
- Since 2001, 27 countries have increased the total proportion of government expenditures allocated to health
- Only SA and Rwanda have reached the Abuja target of around 15%

Health Systems for 21st century Africa

- People-centred health care, universal health coverage, social determinants of health and health outcomes
- Leadership, stewardship, civil society engagement and accountability
- Commodity security
- Health care workforce development and diversity
- Investment in research (a necessity, not a luxury)
- Educational development
- Innovation

Impact of cervical cancer

- The global distribution of cervical cancer is testimony to great inequity in health care
- This preventable disease is the fourth most common in the world, second most common in Africa, and first most common in around 55 countries of the world
- The group of women most affected are in their 40 – 50s, primetime in their lives when they are often heads of households, and the moral and social stalwarts of their societies
- Failure of the world to tackle this disease with vigour and commitment may well be considered a *human rights violation*

Disability-adjusted life years (DALYs) per 100 000 population among women with cervical cancer

- Leading cause of premature death and disability in women
- DALYs per 100 000 in women with cervical cancer were highest:
 - ✓ SSA (641/100 000) compared to
 - ✓ 355/100 000 in Latin America and Caribbean
 - ✓ 243/100 000 in South East Asia
 - ✓ 466/100 000 in India and
 - ✓ 58/100 000 in Australia
- In 2011, SA recorded 4907 cases of cervical cancer of whom 82.7% were diagnosed in black women and 9% in white women

Global inequalities in Cervical Cancer Incidence and Mortality*

- Incidence rates of cervical cancer for women in 184 countries using 2008 Globocan data-base showed a 10 – 20 fold higher rate in very poor countries
- HDI and poverty rate explained > 52% of the global variance in mortality
- Incidence and mortality rates increased in relation to lower HDI and higher gender inequality levels
- A 0.2 unit increase in HDI was associated with a 20% decrease in cervical cancer risk and a 33% decrease in cervical cancer mortality risk

*Singh et al. International Journal of MCH and AIDS. 2012;1(1):17 - 30

Cancer case fatality rates by World Bank Income Group*

Cancer site	Low income	Lower middle income	Upper middle income	High income
Breast	56.3	44.0	38.7	23.9
Cervix	68.4	58.6	48.2	32.6
Colorectal	70.5	62.4	60.1	42.4
Lung	91.3	87.1	92.5	82.2
Oral Cavity	55.4	54.2	47.6	27.7

*Economic Intelligence Unit, 2009

Impact of cervical cancer globally

- Worldwide an estimated 169.3 million years of healthy life were lost due to cancer in 2008*
- SSA contributed to 25% of infection-related cancers (liver, stomach and cervix) to the total burden of cancer
- Areas with highest incidences of cervical cancer (i.e. over 30 /100 000) include: Eastern Africa (42.7), Southern Africa (38.6), Middle Africa (30.6) and Melanesia (33.3)+

*Soerjomataram I, Lancet 2012; 380 (9856): 1840 – 50; +Ferlay et al. International Journal of Cancer 2014;136:E359 - E386

Modern approaches to cervical cancer

- Major focus is on tailoring surgery, particularly fertility sparing
- Evaluation of therapeutic interventions on quality of life
- Use of diagnostic imaging
- Increase effectiveness of primary chemoradiation
- Improve therapy for recurrent disease
- HPV Vaccination

Impact of cervical cancer

- Arossi et al studied 120 patients with ICC in Buenos Aries where mean age was 51 years, 35% were heads of households
- 76% had no health coverage, 45% were living below the poverty line, 30% lived in inadequate dwellings, no patient had socially protected employment
- 40% of households lost family income, resulting in delayed payment of utilities with concomitant loss of access to utilities
- Significant increase in food insecurity, loss of homes and savings
- Major absences of children from school and problems paying for education leading to withdrawal from education

Radiation facilities in Africa

- IAEA analysis of 52 countries in 2010
- 23 offered external beam radiotherapy in 2010
 - 160 radiation centres recorded on the continent
- 80 cobalt- 60 units and 189 linear accelerators
 - 92 machines in South Africa and 76 in Egypt, accounting for 60% of all radiation equipment in Africa
- Only 20/52 countries offered brachytherapy
- Calculated that this could only provide treatment for 24 300 patients per year

*Abdel Wahab et al Lancet Oncology 2013;14(4):168 - 175

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Radiation facilities in Africa

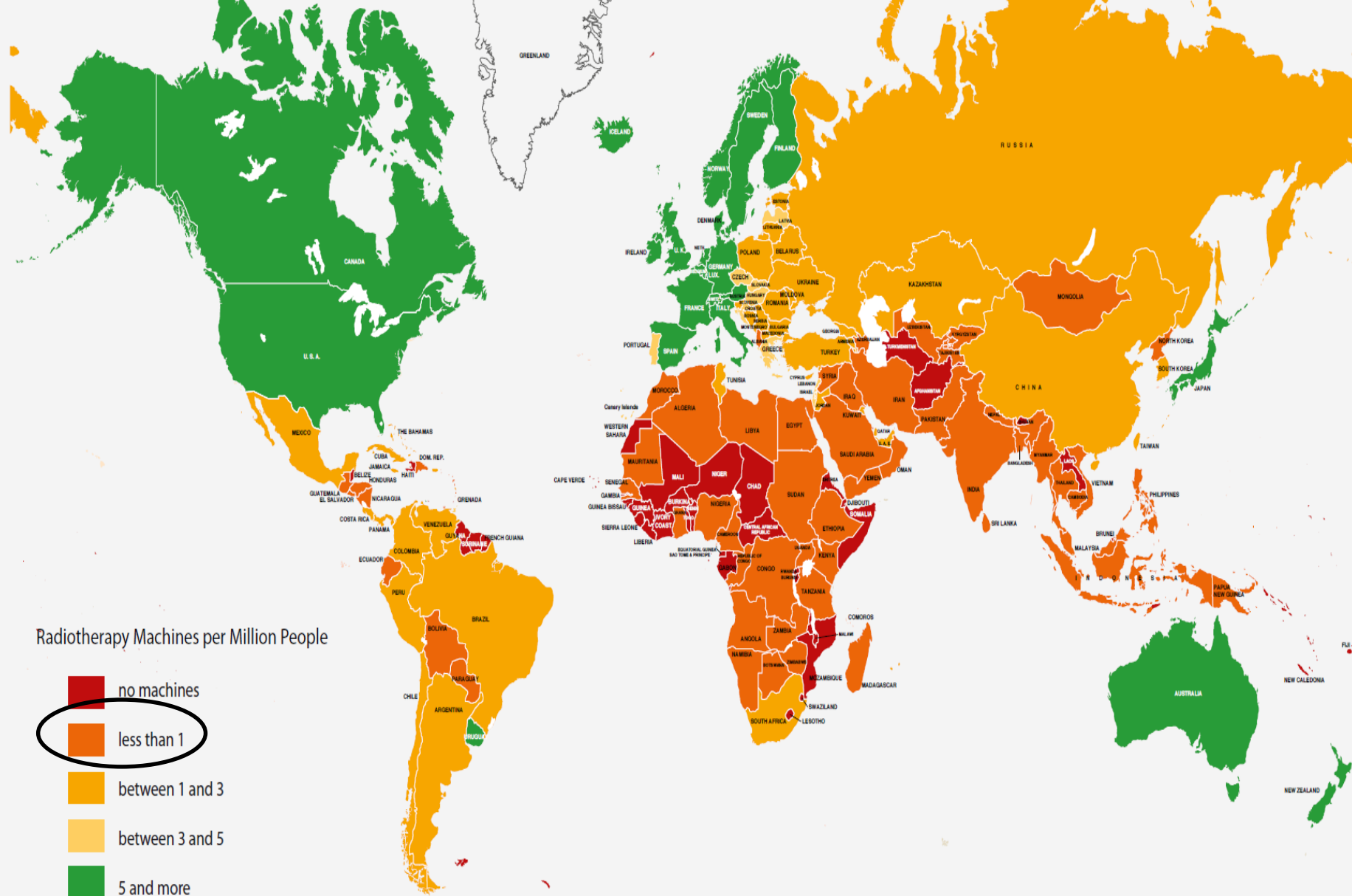
- ***198 million people live in the 29 countries that do not have any teletherapy facilities***
- Range of two machines per 80 million population in Ethiopia to one machine for every 1.1 million people in Morocco
- By contrast:
 - Europeans have 15 machines per million population
 - North America 6 per million population

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Number of Radiotherapy machines needed in Africa*

	Population	New cancer cases 2008	Pts who need RT	Existing RT machines	Additional machines
Egypt	81527	68 805	44 035	76	22
Ghana	23 351	16 580	10 611	2	22
Nigeria	151 212	101 797	65 150	7	138
Angola	18 021	9 198	5 887	1	12
DRC	64 257	33 746	21 597	0	48
Sudan	41 348	21 860	13 990	7	24
Ethiopia	80 713	51 707	33 092	2	72
South Africa	48 793	74 688	47 800	92	14
Zimbabwe	12 463	11 915	7 626	2	15

*Lancet Oncology 2013:14(4): 168 - 175



Source: DIRAC (Directory of Radiotherapy Centres), 2011 / IAEA

For more information:

<http://www-naweb.iaea.org/nahu/dirac/>
dirac@iaea.org

Chemotherapy

- Requires comprehensive 'eco-system' with trained oncologists, pharmacists, laboratory support, access to treatment of complications
- One study from Tanzania evaluated 384 adult cancer patients registered for chemotherapy
- Availability of appropriate chemotherapeutic drugs was 50% and over 70% of patients did not receive prescribed chemotherapeutic agents
- Costs from private sources were equivalent to the average income of 7 months*

*Yohana E et al. East Afr J Public Health 2011, 8(1):52-7

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Modern chemotherapy in recurrent/advanced cervical cancer

- Mainstay of treatment has been cytotoxic chemotherapeutic agents
- New treatments such as monoclonal antibodies have been evaluated
- Bevacizumab is a monoclonal antibody that targets vascular endothelial growth factor
- Trials of patients who received one or two cycles of chemo/chemoradiation followed by bevacizumab showed increased response rate and overall survival
- Providing potential for improved treatment of recurrent and/or advanced disease*

*Monk et al. J Clinical Oncol 2009; 27 (7):1069 - 1074

Surgery and global health

- Estimated that 2 billion people worldwide do not have adequate access to surgical care
- Unmet need for surgical care translates into significant impact on local, regional and national economies
- Study on the number of operating theatres per 100 000 people in 21 sub-regions of the world (769 hospitals in 92 countries)*

* Funk LM et al. Lancet 2010; 376:1055 -1061

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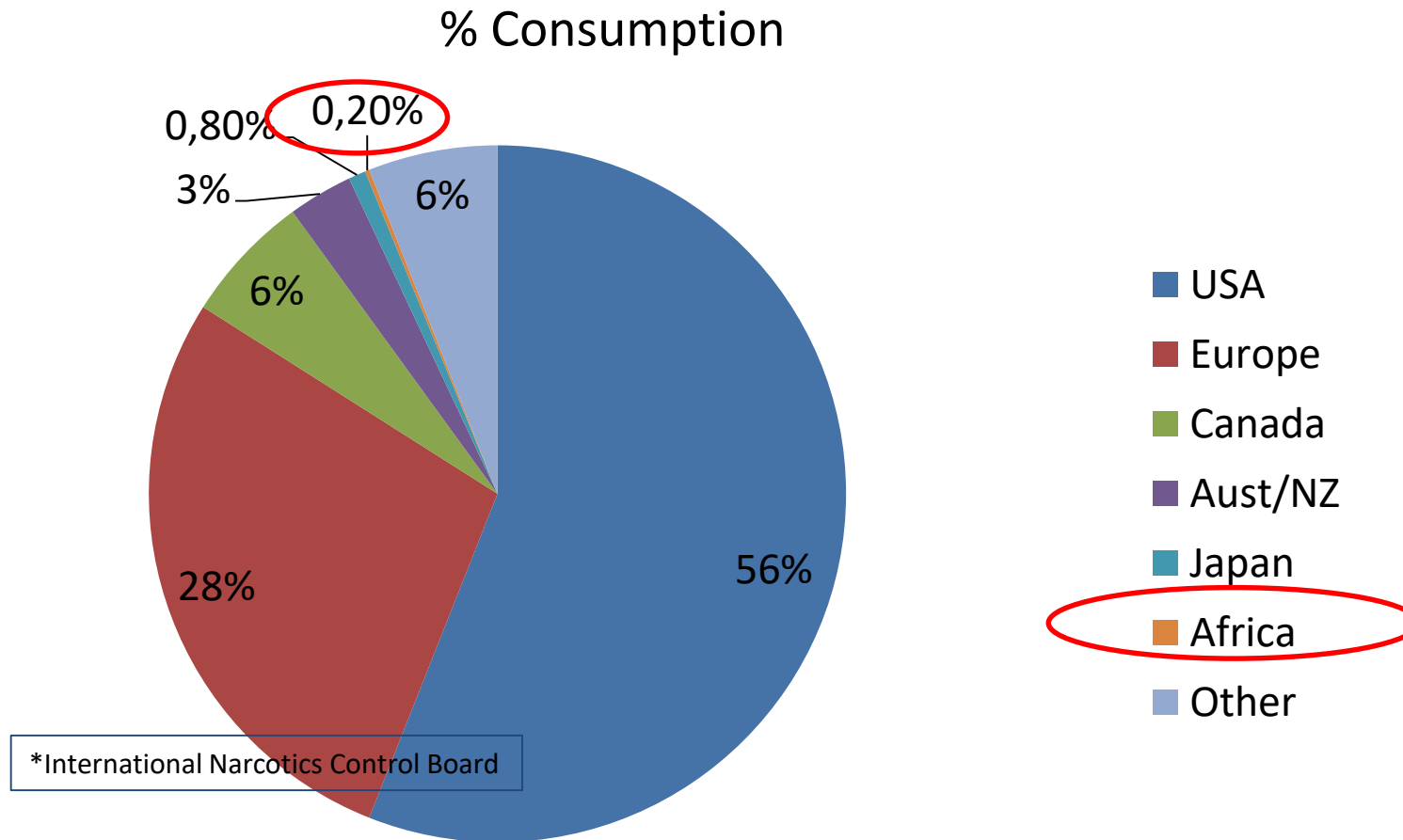
Estimated number of operating theatres per 100 000 people*

Region	GNI (US\$) per capita	No. of theatres per 100 000 population
Asia Pacific	32 834	24.3
Western Europe	38 010	14.7
Australasia	34303	14.3
South East Asia	1912	2.6
SSA – East	434	1.1
SSA - West	755	1.0
SSA – South	4436	3.1
SSA - Central	844	1.2

* Funk LM et al. Lancet 2010; 376:1055 -1061

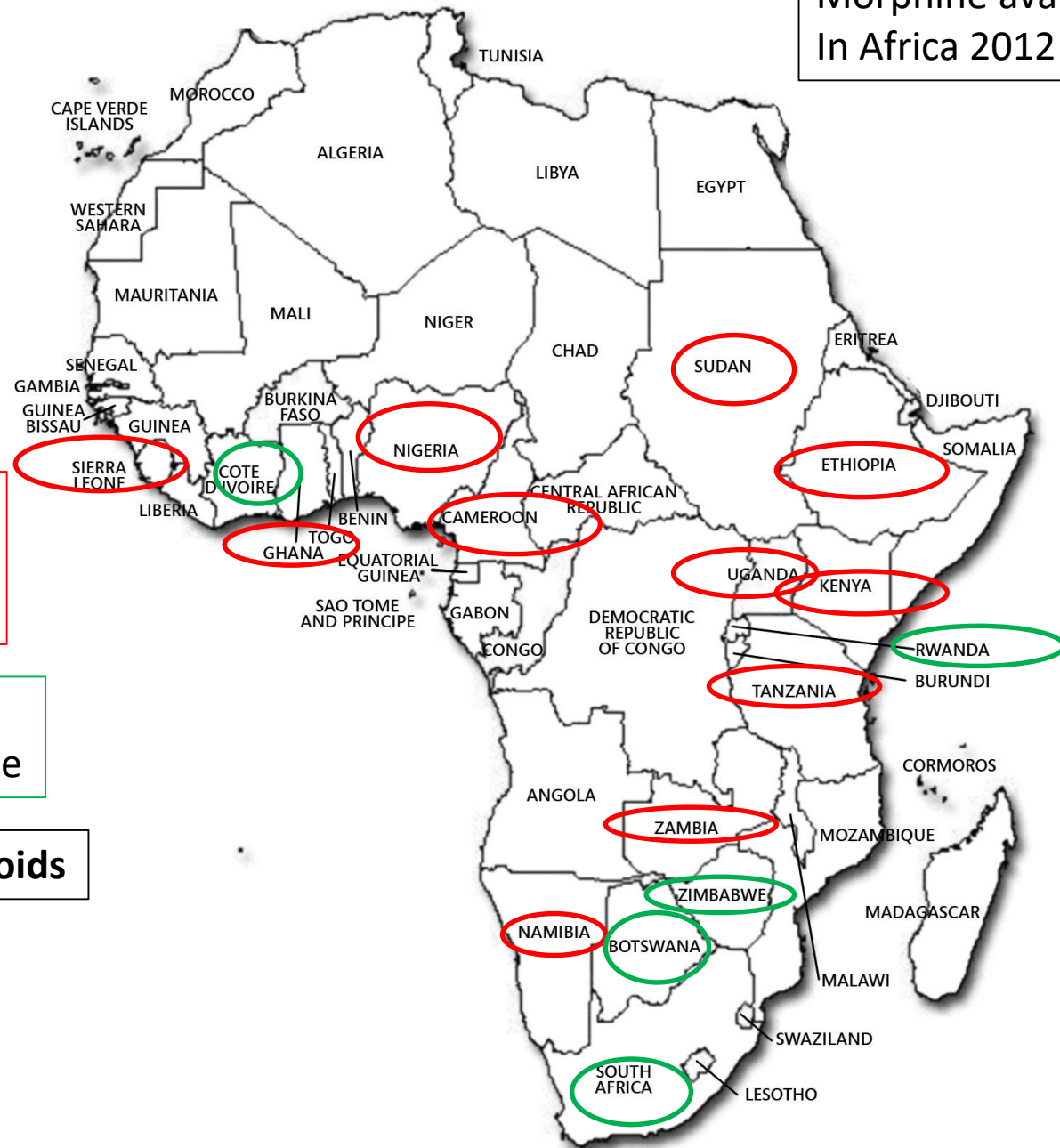
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Consumption of Morphine by Region 2009*



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Morphine availability In Africa 2012



11 Countries that have reconstituted oral morphine from imported powder

5 Countries with access to other types of oral morphine

38 countries no access to opioids



HPV Vaccination

- HPV vaccination supported by WHO
- In 2017 estimated that the total cost of vaccinating 160 million girls (2 doses) and screening and treating 170 million women would be \$3.2 billion
- The return on this investment will be to avert 5.2 million cases of cervical cancer, 3.7 million deaths and 22 million individual years lost to disability
- In 2016, 47 million women received HPV vaccination, but less than 3% were from low income countries

Conclusions

- Health and wealth are strongly correlated
- Cancer care in developing countries is abysmal and not recognised as a public health problem
- Health systems in poor countries are too weak to support the most basic care, let alone cancer with its complexity and expense
- Incidence to mortality ratio for cancers in Africa is around 80% compared to 36% in wealthy nations
- Prevention is the only feasible option for intervention at this point in time
 - Tobacco control
 - Decent water and sanitation
 - Avoidance of western style diet
 - Screening
 - Vaccination
 - Control of environmental toxicity

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Conclusions

- Cancer is not recognised as a significant health problem
- Afflicts women who do not prioritise their own health needs and are often breadwinners and heads of households
- User fees may be crippling
- Lack of health care professionals and training
- Lack of investment by many African Governments in the health of their people



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