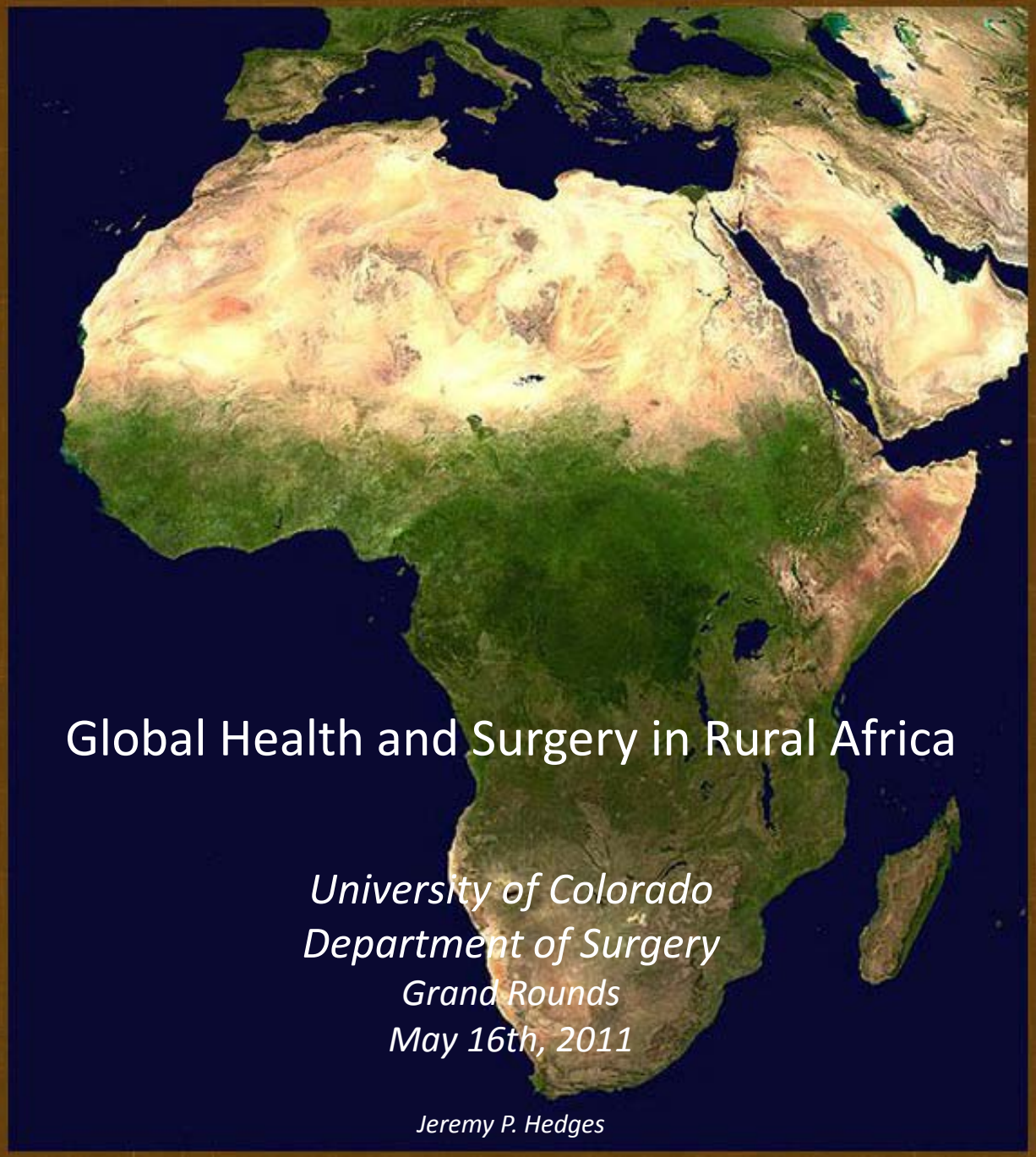
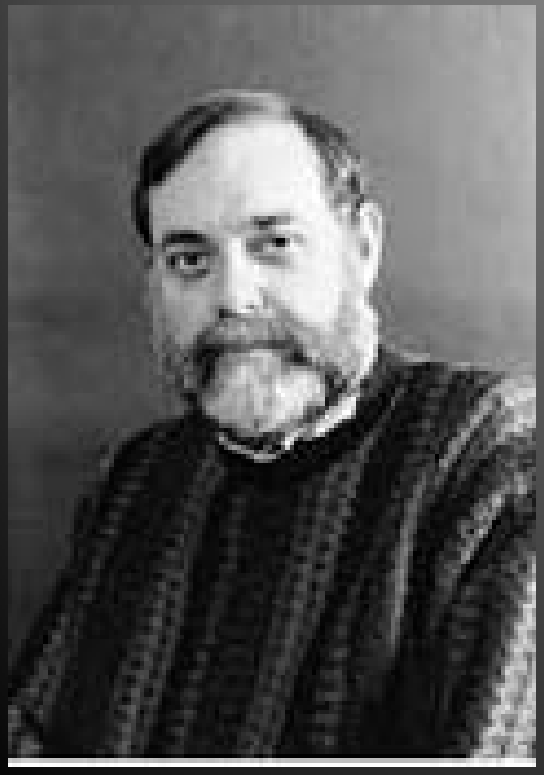


Global Health and Surgery in Rural Africa

University of Colorado
Department of Surgery
Grand Rounds
May 16th, 2011

Jeremy P. Hedges

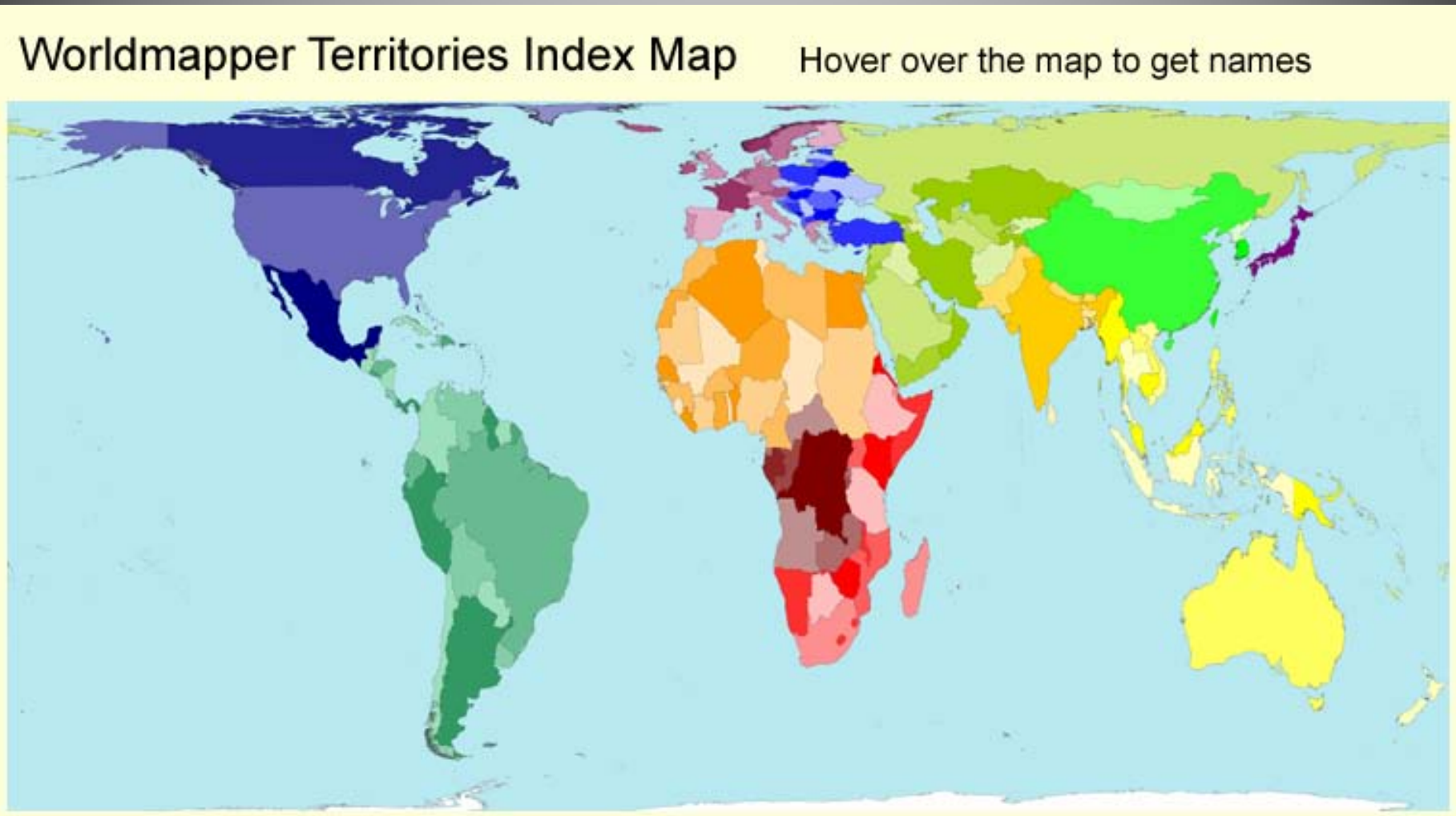

VE
RI
TAS



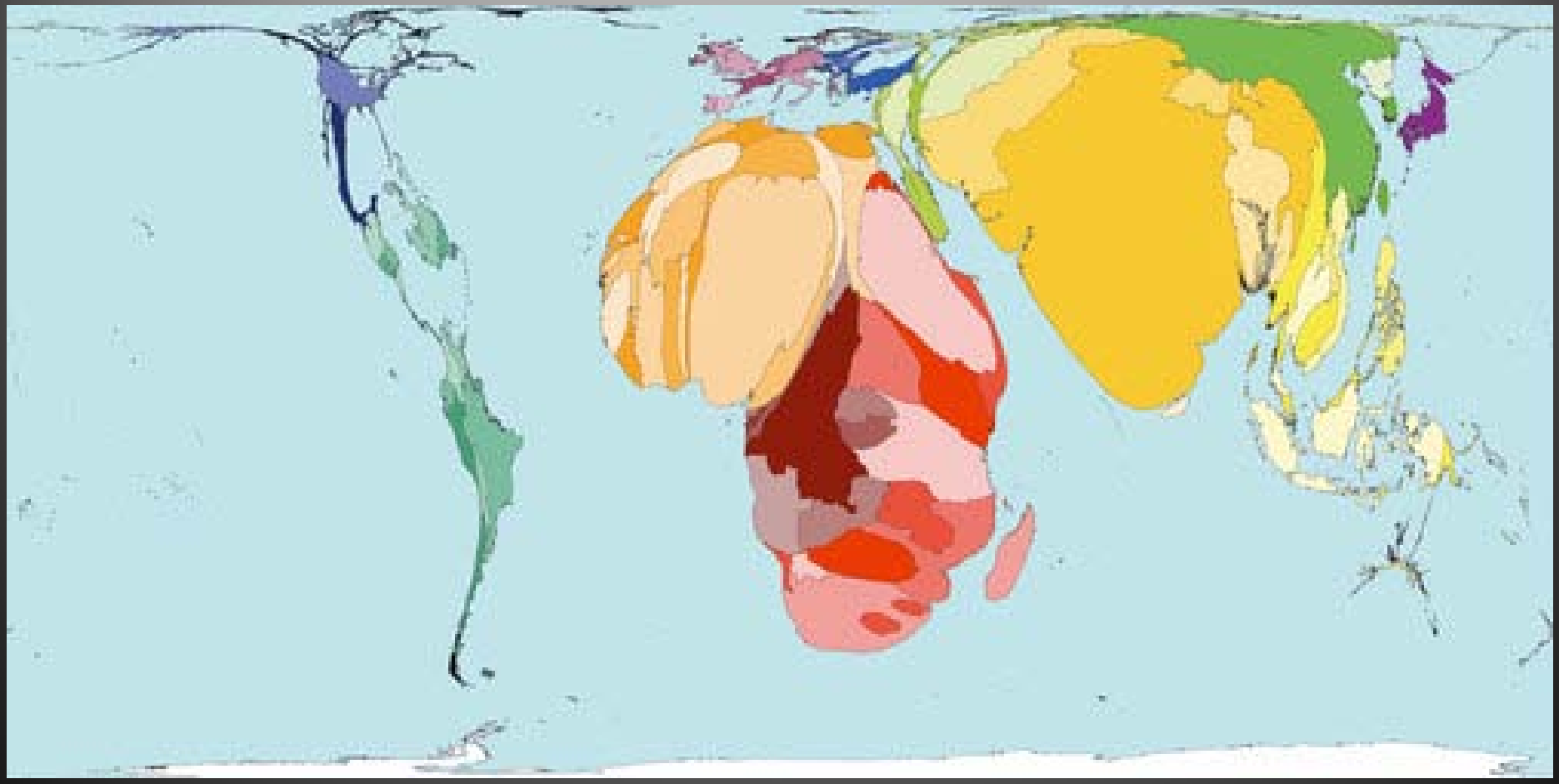

OCTOBER 16, 2006
A POLITICAL SCANDAL IN WASHINGTON ■ LEO & JACK & MATT & MARTY
TIME
A FISTFUL OF SUGAR
+
A PINCH OF SALT
+
A JUG OF WATER ...
... IS THE SIMPLEST REMEDY FOR
A MISERABLE CONDITION.
SO WHY DOES THE ILLNESS STILL KILL 1.9 MILLION
CHILDREN UNDER 5 EACH YEAR?

Surgery in developing countries

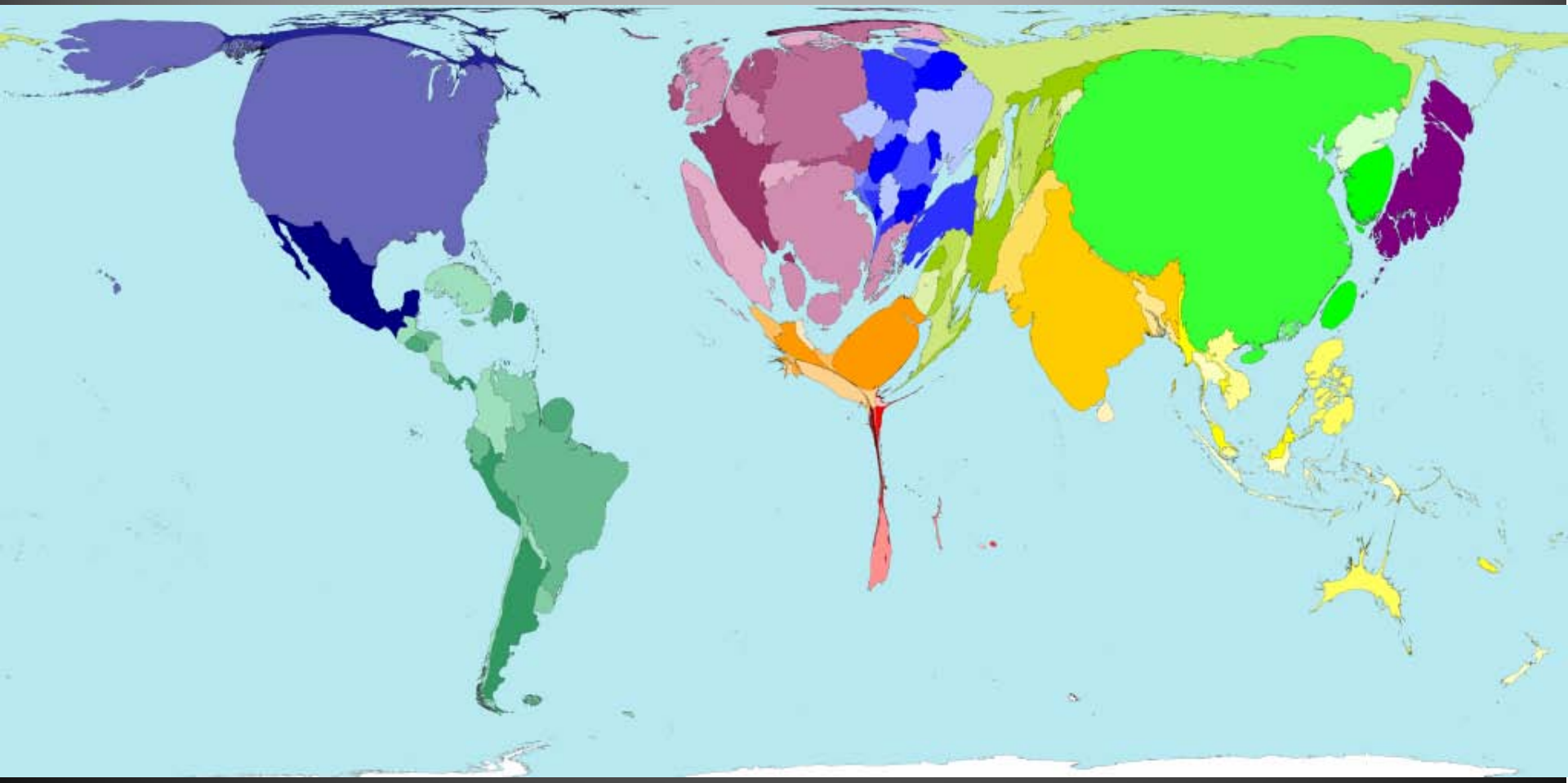
- Is surgery a cost-effective public health intervention?
- Should surgery be considered an aspect of primary health care?
- Are surgical pathologies rare compared to infectious diseases?


Worldmapper Territories Index Map
Hover over the map to get names

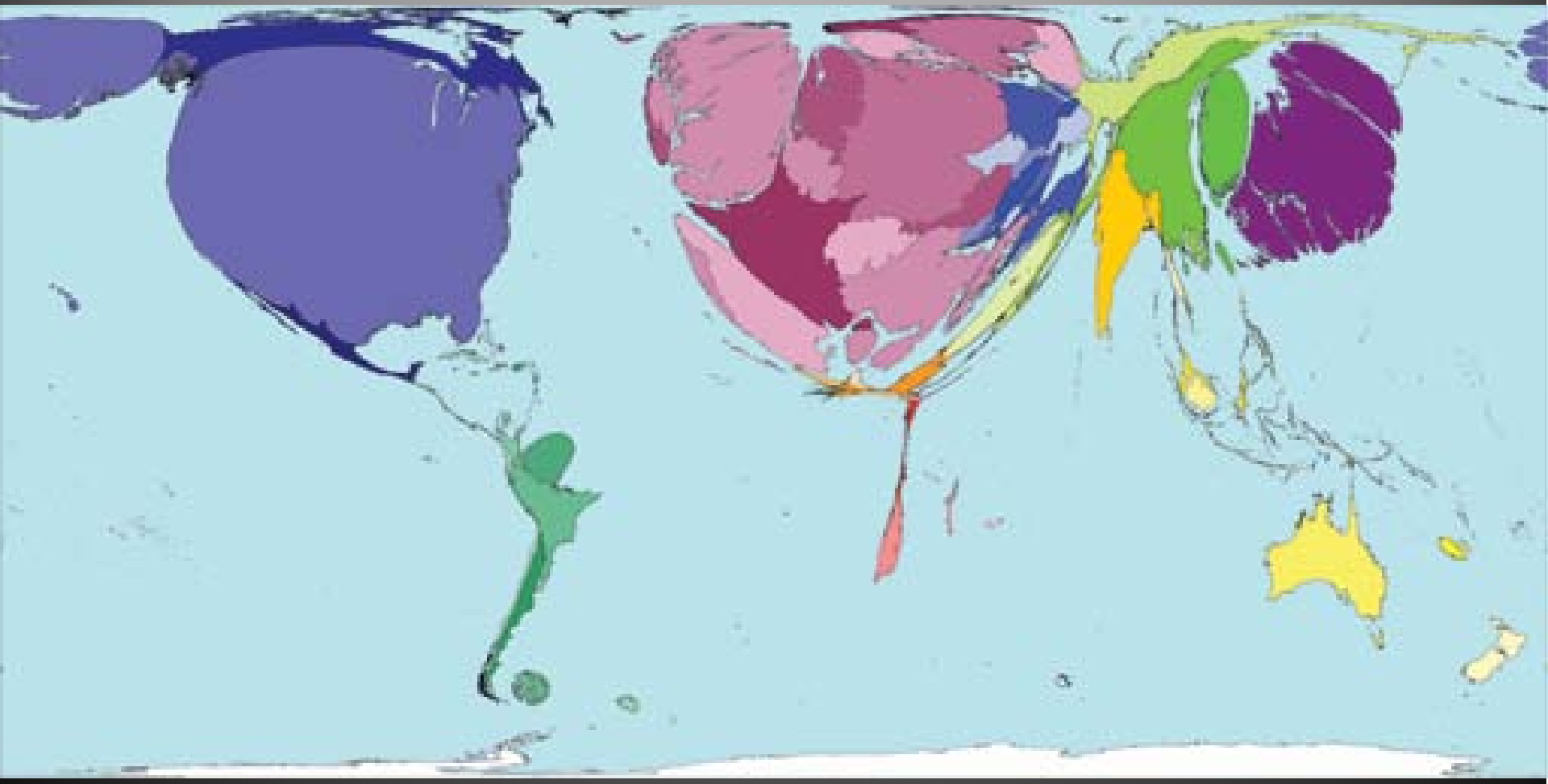
World Map



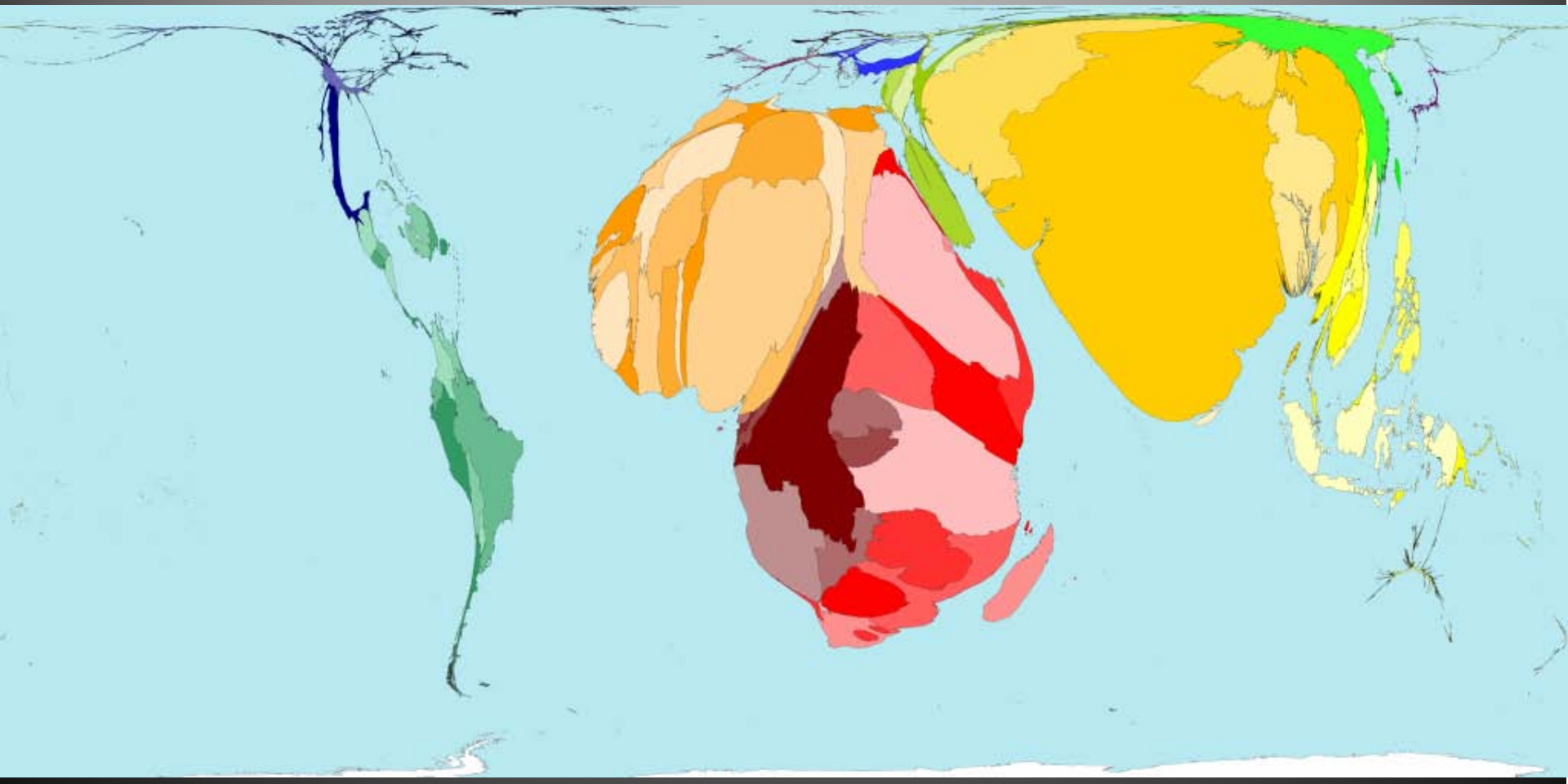
Global Burden of Disease



Physicians Working



Scientific Research



Maternal Mortality

America = 500 surgeons / per million people[5]

- In Africa - 1 surgeon (any type) / million
  - Rural = WORSE
  - Malawi – 1 OB/GYN and 2 GS / 2.5 million[2]
  - Mozambique - 12 OB/GYNs / 15 million people[3]
  - Neurosurgeons
    - 1 per 9 million people (most areas)
    - Eleven countries (46 million) = no neurosurgeons[4]
- 2-3 billion people lack basic surgical care[1]

World J Surg (2008) 32:533–536
DOI 10.1007/s00268-008-9525-9

World Journal of Surgery

Surgery and Global Health: A View from Beyond the OR

Paul E. Farmer · Jim Y. Kim

"Surgery may be thought of as the neglected stepchild of global public health."

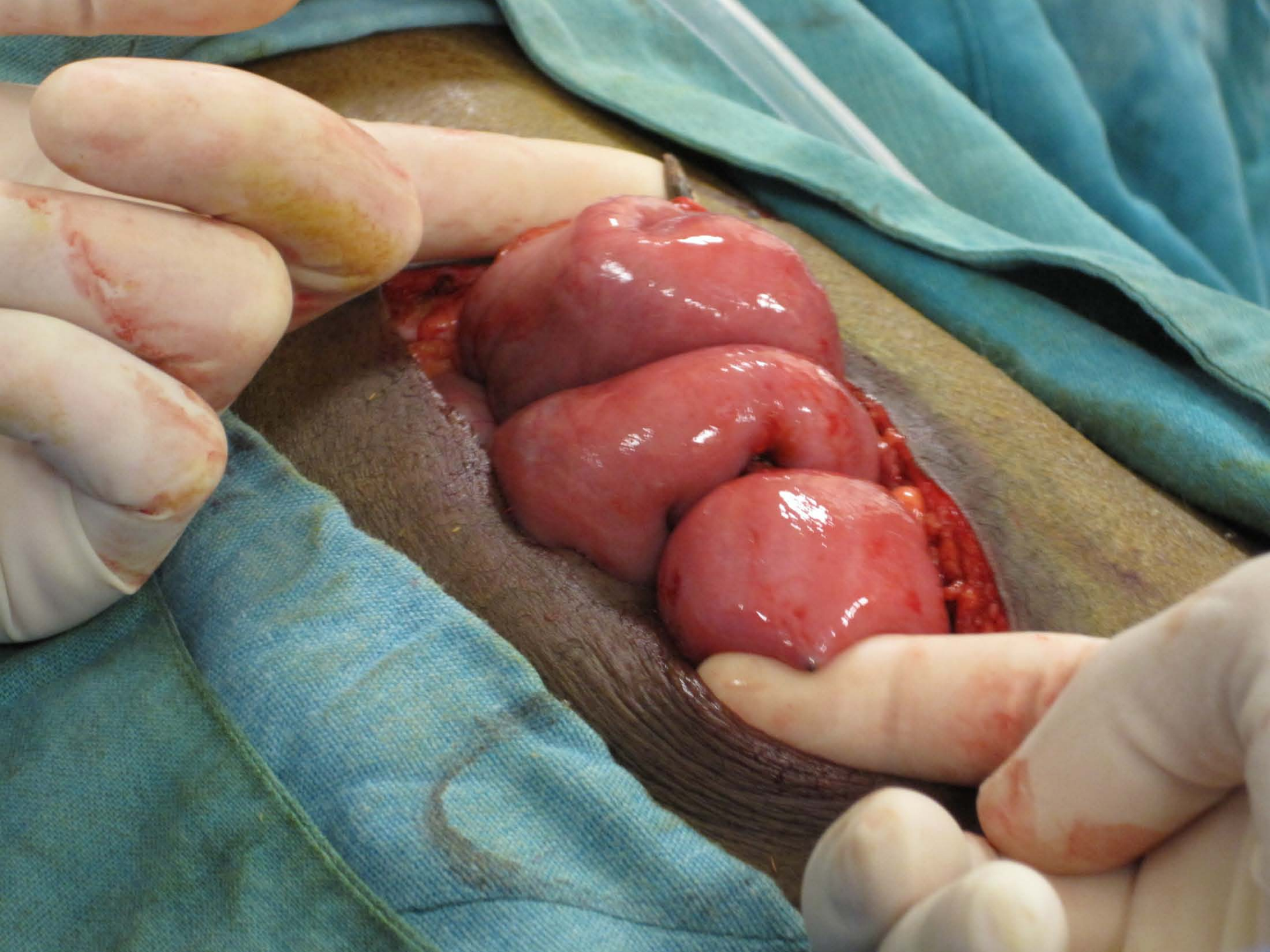
- March 2008


Spain
Mediterranean Sea
Morocco
Tunisia
Iran
Iraq
Israel
Jordan
Kuwait
Persian Gulf
Qatar
U.A.E.
Saudi Arabia
Oman
Western Sahara
Algeria
Libya
Egypt
Red Sea
Mauritania
Mali
Niger
Chad
Sudan
Eritrea
Yemen
Gulf of Aden
Djibouti
Senegal
Gambia
Guinea-Bissau
Guinea
Burkina Faso
Benin
Nigeria
Sierra-Leone
Liberia
Ivory Coast
Ghana
Togo
Central African Republic
Cameroon
Ethiopia
Somalia
Equatorial Guinea
Gulf of Guinea
Gabon
Congo
Uganda
Kenya
Rwanda
Burundi
Democratic Rebublic of the Congo
Tanzania
Indian Ocean
Atlantic
Seychelles
Angola
Malawi
Comoros
Zambia
Mozambique
Mozambique Channel
Zimbabwe
Namibia
Botswana
Madagascar
Swaziland
Lesotho
South Africa
Ocean


SUDAN
ETHIOPIA
Dawa
Lokitaung
Lake Turkana
North Horr
Mandera
Lodwar
Moyale
Turkwel
CHALBI DESERT
Buna
El Wak
UGANDA
Lokichar
Choba
Marsabit
SOMALIA
South Horr
Marsabit N. Res.
Wajir
KENYA
Maralal
Habaswein
Mt. Elgon
Kitale
GREAT RIFT VALLEY
Wamba
Mado Gashi
Kakamega
Eldoret
Nanyuki
Meru
Kisumu
Nakuru
Nyeri
Mt. Kenya
Tana
Kericho
Chiokarige
Garissa
Gilgil
Homa Bay
Thika
Embu
Lake Victoria
Masai Mara Game Park
NAIROBI
Bura
Nairobi N.P.
Machakos
Athi
Tsavo N.P.
Makindu
Lamu
Kipini
GREAT RIFT VALLEY
Galana
Indian Ocean
Voi
Malindi
Kilifi
TANZANIA
Mombasa
Gazi


PRESEPT

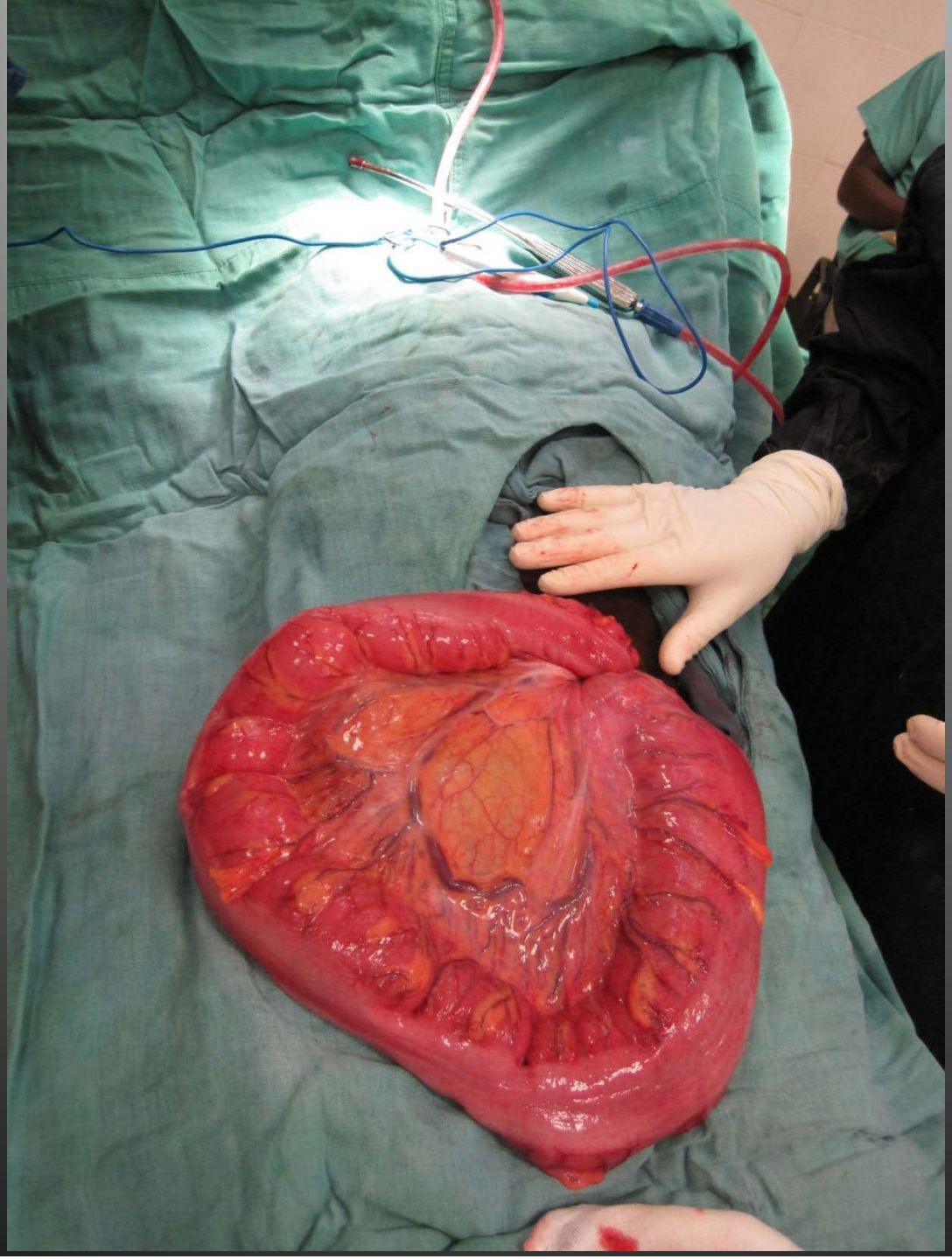

ENDOTRACHEAL TUBE
TRACHEAL TUBE
ENDOTRACHEAL TUBE
SOCCER




Ansell
Gammex


KMCG
077X
BLESS
NGWENJE


KENDALL

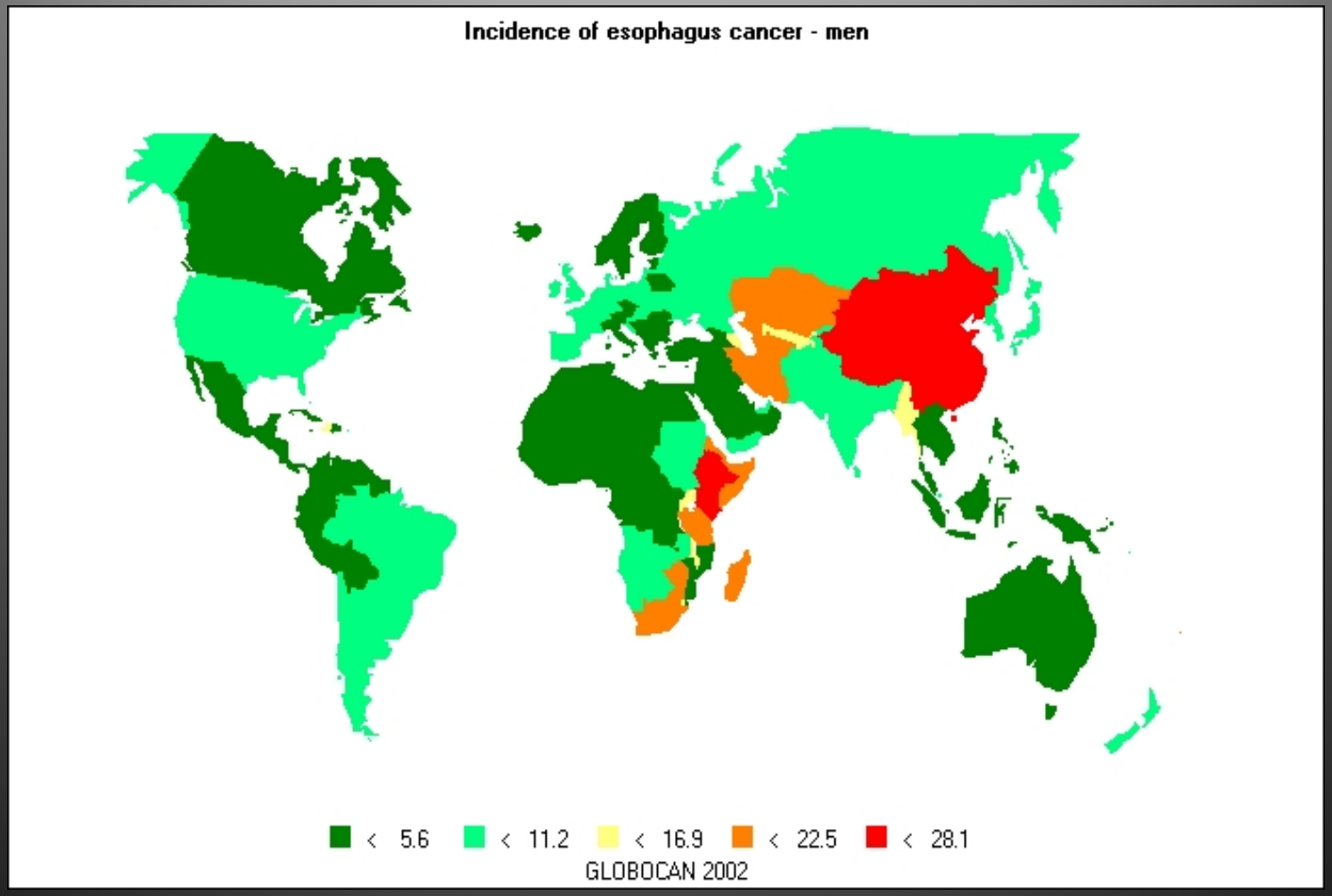



Avelox I.V.
TRACHEAL TUBE


NTULELE
MEDICAL
ANTI-NATAL
CLINIC
24 HOURS SERVICE
BOX 264 NAROK.

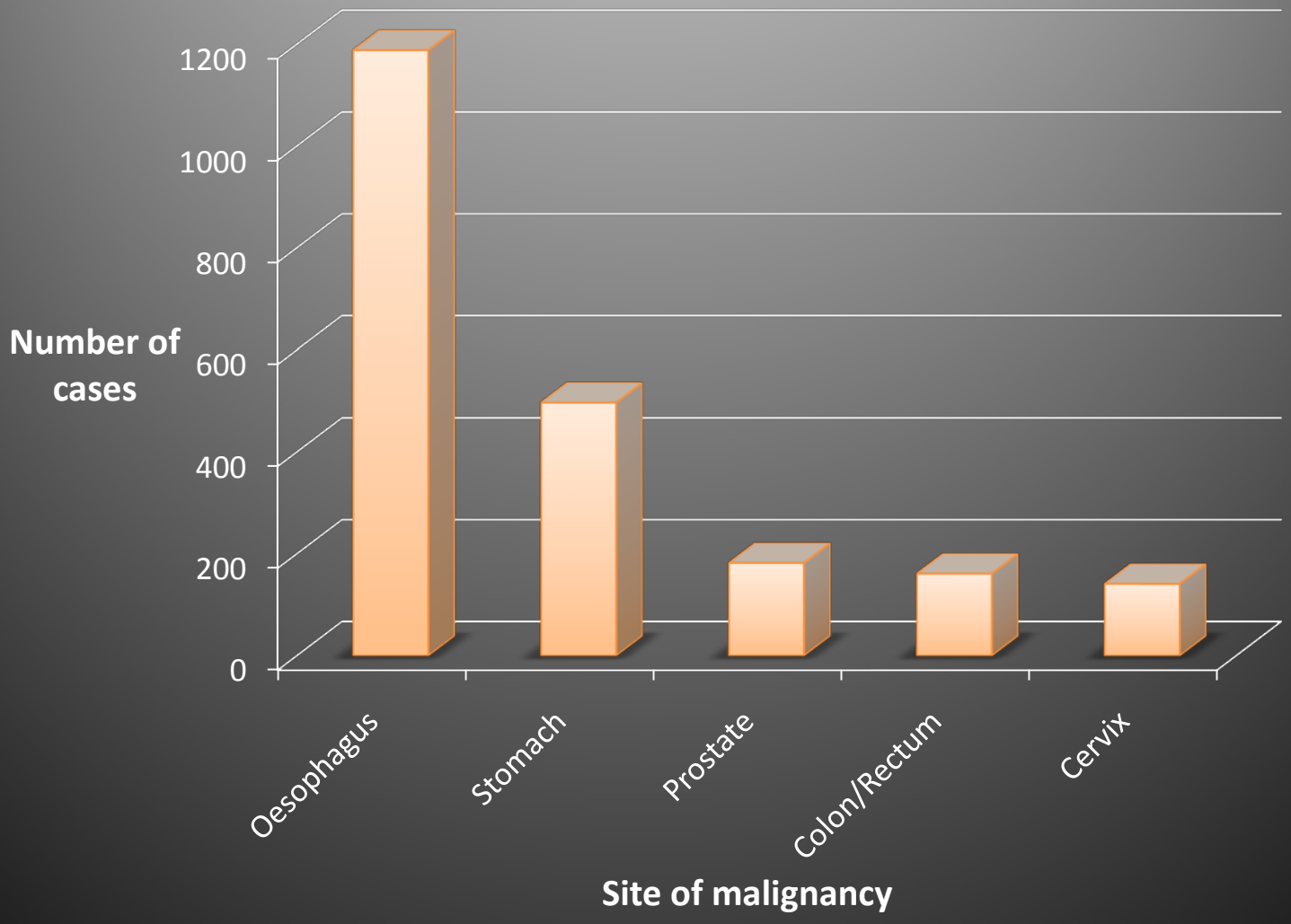

TRACHEAL TUBE

Esophageal Cancer

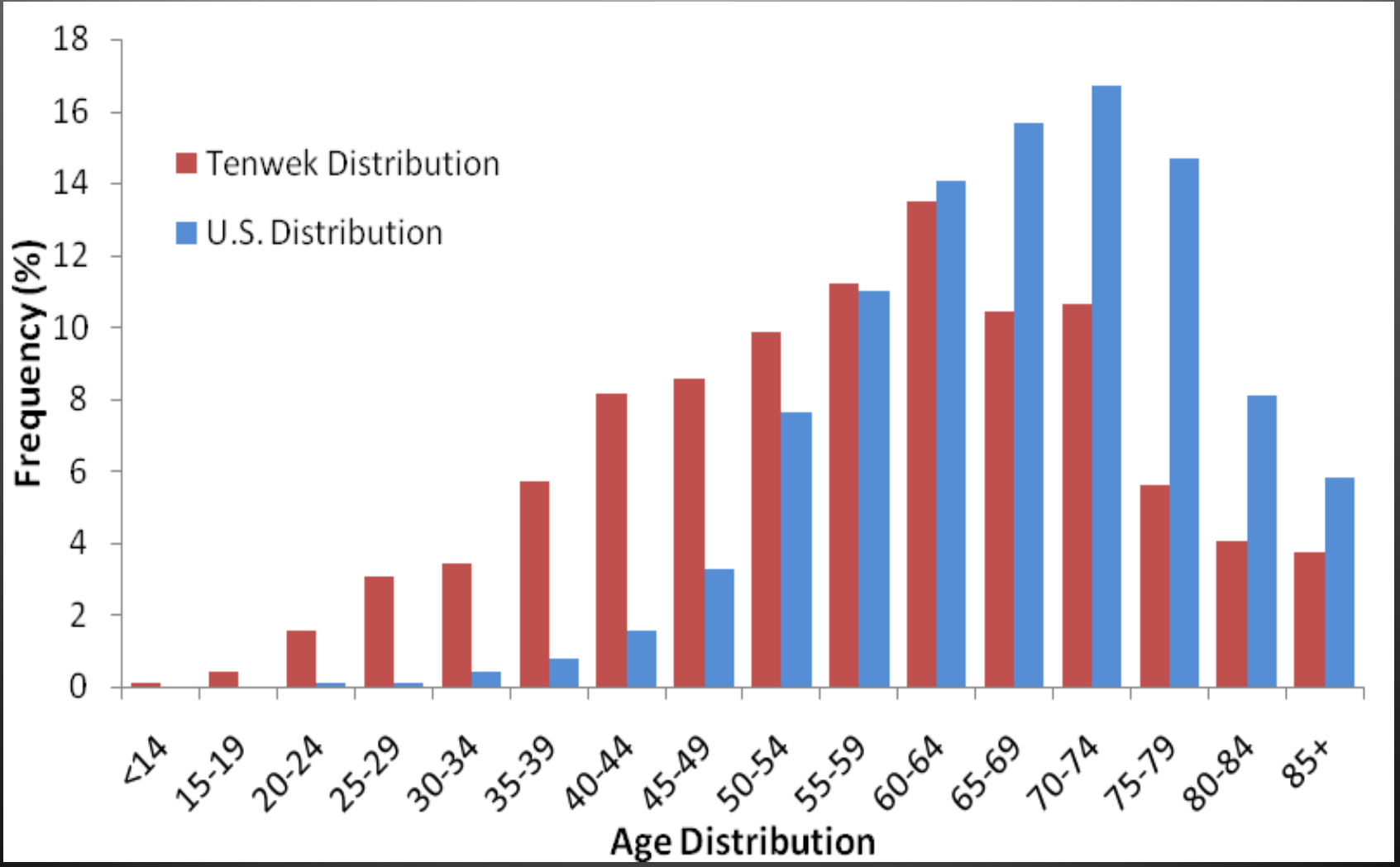


Ferlay, et al. http://www-depdb.iarc.fr/globocan2002.htm

5 Most common malignancies diagnosed from January 1999 - August 2007



Unique to Kenya



Parker et al. Disease of the Esophagus 2009

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- White RE, Mungatana C, Mutuma G *et al.* Absence of human papillomavirus in esophageal carcinomas from southwestern Kenya. Dis Esophagus 2005;18:28-30
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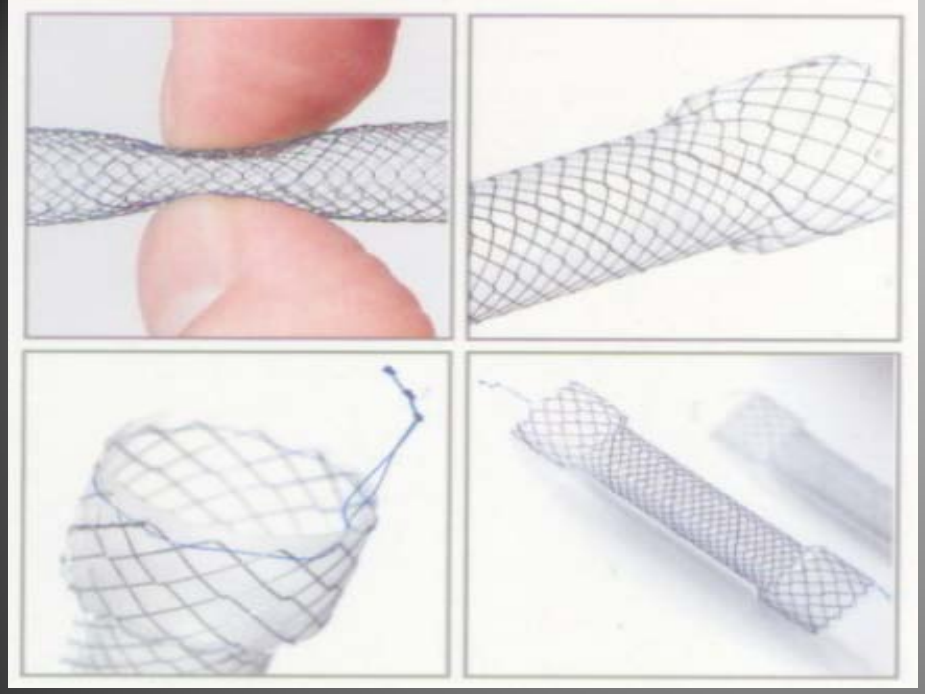
- White, RE, Parker, RK, Fitzwater, JW, Kasepoi, Z, Topazian, M. Stents as sole therapy for oesophageal cancer: a prospective analysis of outcomes after placement. Lancet 2009; 10: 240-246

SEMS

Self-Expanding Metal Stents



Beijing Rui Chang Medical Technology Development Co.

Esophageal stent placement without flouroscopy.
Gastrointestinal Endoscopy. White et al. March 2001


COFFEE

- Median Survival
  - SEMS 250 days (8.4 mo)
  - *10 European and North American series*
    - *Range 49-186 days*
  - *Non-randomised case-control study (n=72)*
    - *Chemotherapy + Radiation - 11 months*
    - *SEMS – 4mo*
  - *Other reported palliative modalities*
    - *Photodynamic therapy - 4.8mo*
    - *Laser therapy – 4.1-4.6mo*
    - *Single-dose brachytherapy – 4.9-7.9mo*
- *Dysphagia scores*
  - *Still alive 90% - improved (mean score 1.0)*
  - *At time of death - 77% improved, 20% no change, 3% worse (mean 1.8)*

Complications

	Number of complications
Early complications	
Perforation	34*
Bleeding	7
Severe chest pain	10
Death	3
Late complications†	
Overgrowth or obstruction	55
Migration	3
Tracheo-oesophageal fistula after SEMS placement	8

SEMS=self-expanding metal stent. 10 patients had both an early and late complication. *37 perforations occurred in the 1950 patients undergoing endoscopic dilation of an oesophageal tumour during the study period, 34 of whom were treated with SEMS placement. Overall perforation frequency was 1·9%. †Occurring in 62 of 334 patients with long-term follow-up; four patients had obstruction or overgrowth twice.

Table 2: Procedure-related complications

- Perforation 1.9%
  - 37 (in 1950 dilations)
    - 4 Died within 30 days
    - 1 underwent surgery
    - Remaining stented
      - Median survival 283 days
- Procedure related mortality
  - 0.3%

Expandable Stents for Iatrogenic Perforation of Esophageal Malignancies
White et al. J Gastro Surg 2003

Surgery in developing countries

- MYTH #1: Surgery is not a cost-effective public health intervention
- MYTH#2: Surgery is not an aspect of primary health care
- MYTH#3: Surgical issues are rare compared to infectious diseases

MYTH #1: Surgery is not a cost-effective public health intervention

DISEASE CONTROL PRIORITIES PROJECT

June 2008

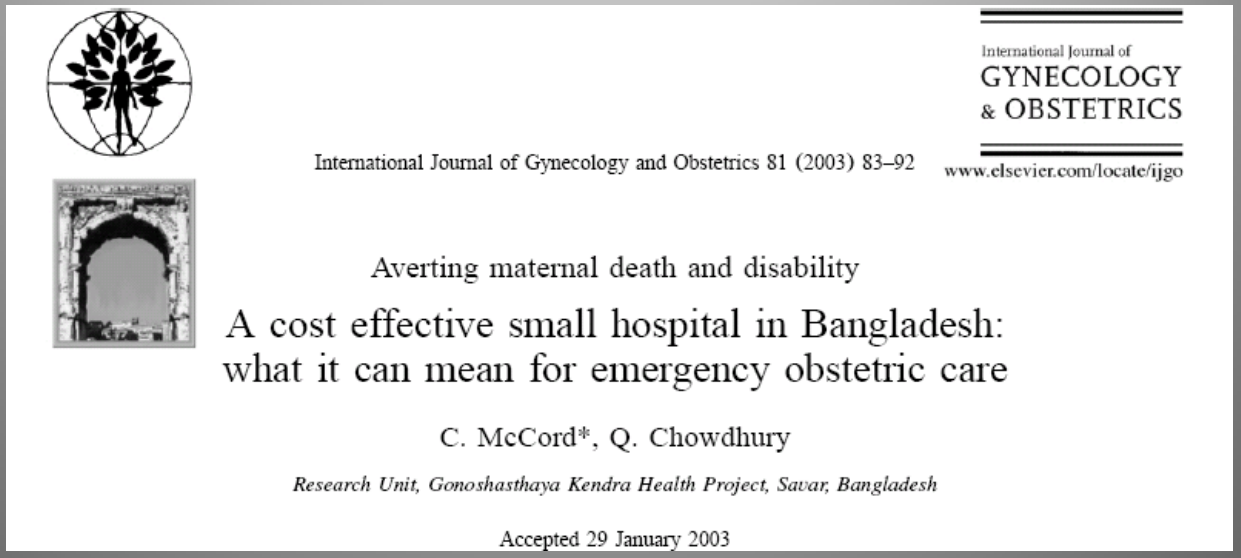
Promoting Essential Surgery in Low-Income Countries

A Hidden, Cost-Effective Treasure

"Basic surgical services can be highly cost-effective – even on par with widely accepted preventive health care such as immunization for measles and tetanus."

Copenhagen Convention

- Air pollution, Conflicts, Diseases, Education, Global Warming, Malnutrition and Hunger, Sanitation and Water, Subsidies and Trade Barriers, Terrorism, Women and Development
- Top 30 priorities: Improving surgical capacity - district hospital



International Journal of Gynecology and Obstetrics 81 (2003) 83–92

International Journal of GYNECOLOGY & OBSTETRICS

www.elsevier.com/locate/ijgo

Averting maternal death and disability

A cost effective small hospital in Bangladesh: what it can mean for emergency obstetric care

C. McCord*, Q. Chowdhury

Research Unit, Gonoshasthaya Kendra Health Project, Savar, Bangladesh

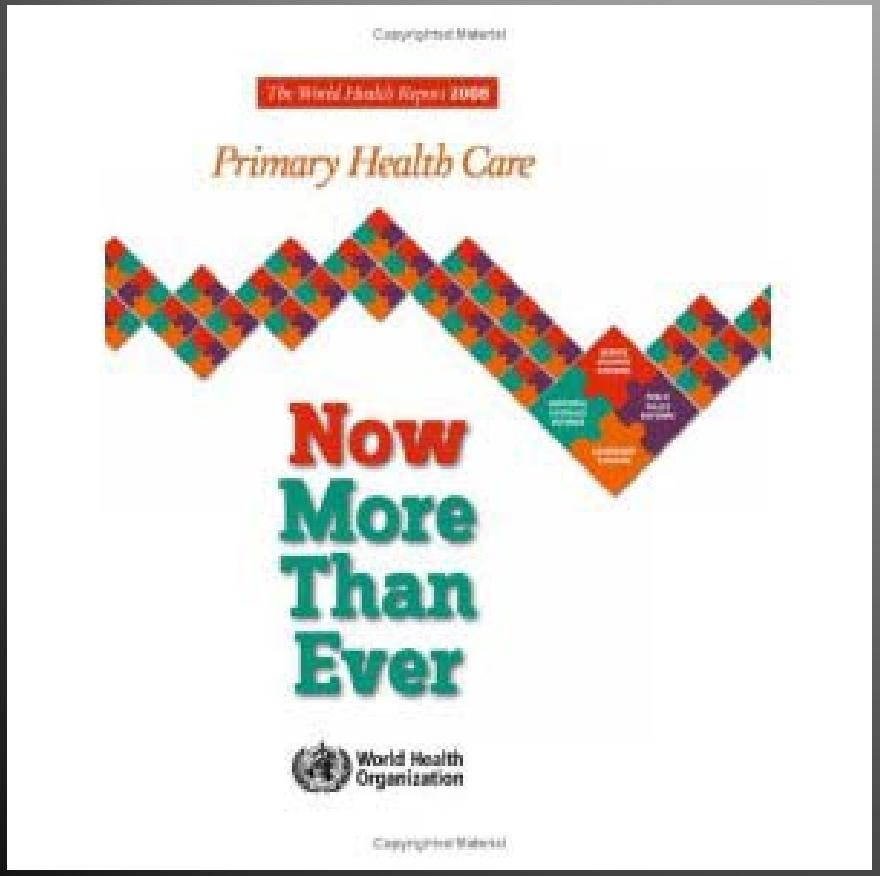
Accepted 29 January 2003

- Cost per DALY of emergency obstetric care - rural hospital in Bangladesh
  - $10.93/DALY averted
- For all surgical care services provided at hospital in Sierra Leone
  - $32.78/DALY averted
- Other primary interventions
  - Vitamin A distribution - $9/DALY averted
  - Acute lower respiratory infection detection & treatment - $20/DALY averted
  - Measles immunization - $30/DALY averted

The cost-effectiveness of forty health interventions in Guinea. Jha et al. Health Policy and Planning 1998

- Cost-effectiveness of 40 health interventions
  - included three surgical conditions
  - severe trauma, appendicitis, and hernia
- Cost / Life Years Saved (LYS)
- Results
  - appendectomy - $36/LYS,
  - Hernia - $74/LYS
  - Severe Trauma - $233/LYS
- In contrast
  - medical treatment for…
    - Diarrhea $74/LYS
    - Malaria $84/LYS.

MYTH#2: Surgery is not an aspect of primary health care



- 1978 - Alma-Ata Declaration on Primary Health Care
  - "Prevention and control of locally endemic diseases; appropriate treatment of common diseases and injuries"

MYTH#3: Surgical issues are rare compared to infectious diseases

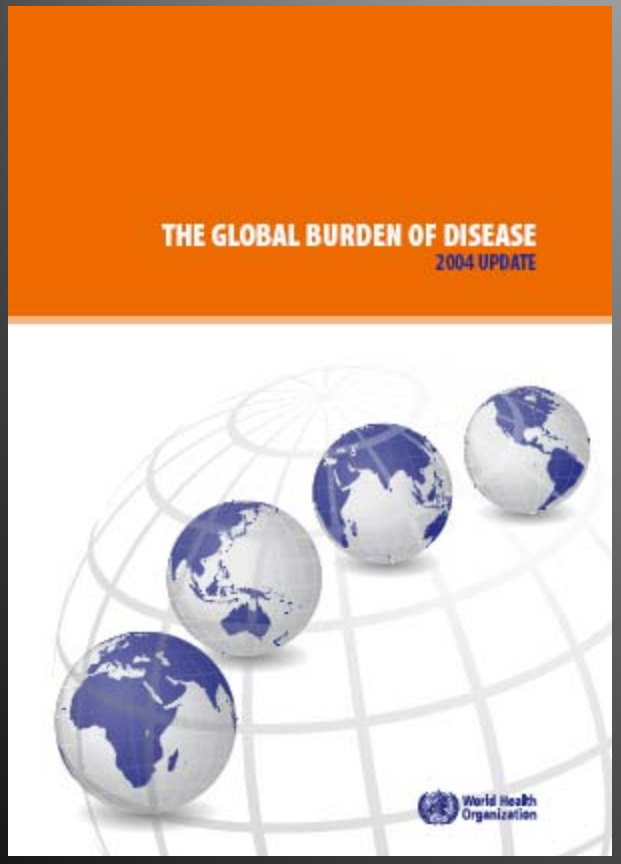
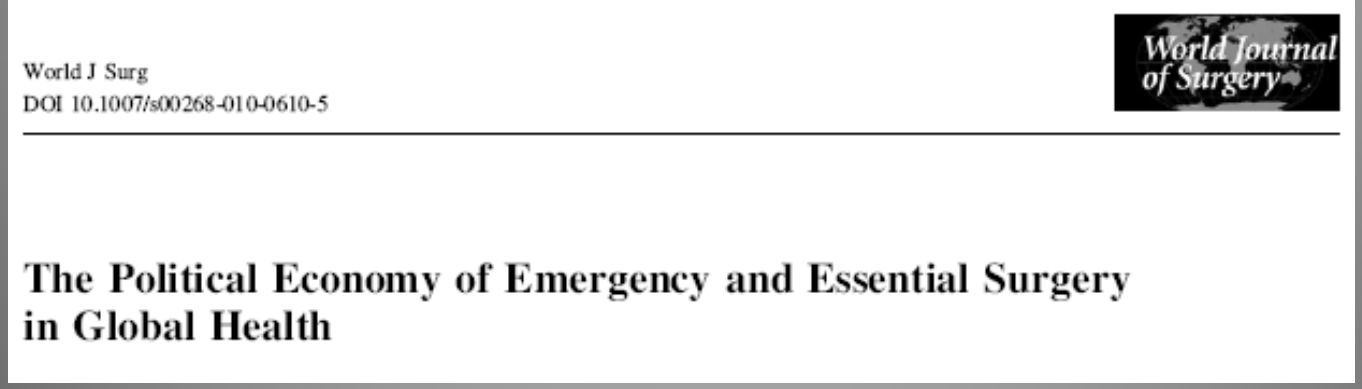


Figure 27: Ten leading causes of burden of disease, world, 2004 and 2030

2004 Disease or injury	As % of total DALYs	Rank	Rank	As % of total DALYs	2030 Disease or injury
Lower respiratory infections	6.2	1	1	6.2	Unipolar depressive disorders
Diarrhoeal diseases	4.8	2	2	5.5	Ischaemic heart disease
Unipolar depressive disorders	4.3	3	3	4.9	Road traffic accidents
Ischaemic heart disease	4.1	4	4	4.3	Cerebrovascular disease
HIV/AIDS	3.8	5	5	3.8	COPD
Cerebrovascular disease	3.1	6	6	3.2	Lower respiratory infections
Prematurity and low birth weight	2.9	7	7	2.9	Hearing loss, adult onset
Birth asphyxia and birth trauma	2.7	8	8	2.7	Refractive errors
Road traffic accidents	2.7	9	9	2.5	HIV/AIDS
Neonatal infections and other[a]	2.7	10	10	2.3	Diabetes mellitus
COPD	2.0	13	11	1.9	Neonatal infections and other[a]
Refractive errors	1.8	14	12	1.9	Prematurity and low birth weight
Hearing loss, adult onset	1.8	15	15	1.9	Birth asphyxia and birth trauma
Diabetes mellitus	1.3	19	18	1.6	Diarrhoeal diseases


World J Surg
DOI 10.1007/s00268-010-0610-5

World Journal of Surgery

The Political Economy of Emergency and Essential Surgery in Global Health

- Organizational:
  - Coordinate stakeholders
  - Expertise in policy and global public health (e.g. global health tracks during/after residency)
- Symbolic
  - Reframe EES as an essential component of primary health care
  - Use media for EES issues (e.g. maternal health and injury epidemic)
- Economic
  - Promote national health insurance schemes and novel mechanisms of sustainable funding
- Research
  - Expand collaborative research partnerships
- Political
  - Influence policy makers to promote the EES agenda.


TH/C
003

Expanding Options

- Twinning / Collaboration
- Public private partnerships (PPPs)
  - Integral for WHO / UNICEF
- Funding
  - Unprecedented money available in global health
  - Philanthrocapitalism
    - Gates foundation
      - $37.1 billion
      - Min $1.5 billion / yr
      - $2.6 billion 2010
      - $25 billion since inception