Presenter:             Cumming, Bob (Prof.)
Title of Lecture:     Global Health and Ageing
Global Health and Ageing

Bob Cumming
Professor of Epidemiology
School of Public Health
University of Sydney
Australia
Overview of Presentation

• What is global health?
• MIPH group
• Research on ageing in Australia
• The George Institute
• The future
Towards a common definition of global health

Jeffrey P Kaplan, T Christopher Bond, Michael H Marson, K Srinath Reddy, Mario Henry Rodriguez, Nelson K Sewankambo, Judith N Wasserheit, for the Consortium of Universities for Global Health Executive Board

Global health is fashionable. It provokes a great deal of communicable infections, the education of the individual interest and concern. For developing countries, it is crucial to be involved in health promotion and public health activities.
### Global Health vs. International Health

<table>
<thead>
<tr>
<th></th>
<th>Global Health</th>
<th>International Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographical focus</td>
<td>Transcends national boundaries</td>
<td>Low and middle income countries</td>
</tr>
<tr>
<td>Level of cooperation</td>
<td>Global</td>
<td>Binational</td>
</tr>
<tr>
<td>Individuals or populations?</td>
<td>Prevention in populations and clinical care</td>
<td>Prevention in populations and clinical care</td>
</tr>
<tr>
<td>Access to health</td>
<td>Health equity among nations and for all people is a major objective</td>
<td>Seeks to help people in other countries</td>
</tr>
<tr>
<td>Disciplines</td>
<td>Interdisciplinary and multidisciplinary</td>
<td>“has not emphasised multidisciplinarity”</td>
</tr>
</tbody>
</table>

International Public Health

“The application of the principles of public health to health problems and challenges that affect low- and middle income countries, and to the complex array of global and local forces that influence them.”

History of International Public Health
Some Important Dates

• 1948: WHO established
History of International Public Health

Some Important Dates

• 1948: WHO established
• 1959: Smallpox eradication program started
History of International Public Health
Some Important Dates

- 1948: WHO established
- 1959: Smallpox eradication program started
- 1974: Expanded Program on Immunisation (EPI)
- 1978: Alma Ata Declaration
- 1981: AIDS first diagnosed
The Millennium Preston Curve

Source: www.ethics.harvard.edu/download/deaton.pdf
History of International Public Health
Some Important Dates

• 1948: WHO established
• 1959: Smallpox eradication program started
• 1974: Expanded Program on Immunisation (EPI)
• 1978: Alma Ata Declaration
• 1981: AIDS first diagnosed
• 1993: Investing in Health Report (World Bank)
• 2000: Health Systems Report (WHO)
• 2000: Millennium Development Goals (UN)
Millennium Development Goals

GOAL 1: Eradicate extreme poverty and hunger
GOAL 2: Achieve universal primary education
GOAL 3: Promote gender equality and empower women
GOAL 4: Reduce child mortality*
GOAL 5: Improve maternal health*
GOAL 6: Combat HIV/AIDS, malaria and other diseases*
GOAL 7: Ensure environmental sustainability
GOAL 8: Develop a global partnership for development
Major Players in International Health

• United Nations: WHO, UNICEF, UNAIDS
• World Bank
• Bilateral agencies: USAID, DFID
• International NGOs: MSF, Oxfam, World Vision
• Bill and Melinda Gates Foundation (1999)
• Global Fund to Fight AIDS, Tuberculosis and Malaria (2002)
• Bono, Bob Geldof
Causes of Death, World

- Group 1: Communicable, maternal, perinatal, nutritional conditions
- Group 2: Noncommunicable diseases
- Group 3: Injuries

## Causes of Death in Rural India

<table>
<thead>
<tr>
<th>Cause of Death</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular</td>
<td>32%</td>
</tr>
<tr>
<td>Injury (inc. suicide)</td>
<td>13%</td>
</tr>
<tr>
<td>Cancer</td>
<td>7%</td>
</tr>
<tr>
<td>Respiratory disease</td>
<td>5%</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>4%</td>
</tr>
<tr>
<td>Diarrhoea</td>
<td>4%</td>
</tr>
<tr>
<td>HIV</td>
<td>2%</td>
</tr>
</tbody>
</table>

## Causes of Death in Rural Kenya

<table>
<thead>
<tr>
<th>Cause of Death</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV</td>
<td>27%</td>
</tr>
<tr>
<td>Malaria</td>
<td>14%</td>
</tr>
<tr>
<td>Respiratory infection</td>
<td>10%</td>
</tr>
<tr>
<td>Injury</td>
<td>8%</td>
</tr>
<tr>
<td>Diarrhoea</td>
<td>7%</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>7%</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>4%</td>
</tr>
<tr>
<td>Cancer</td>
<td>4%</td>
</tr>
</tbody>
</table>

## Demographic Transition Theory

<table>
<thead>
<tr>
<th>Stage</th>
<th>Fertility</th>
<th>Mortality</th>
<th>Population size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>High</td>
<td>High</td>
<td>Stable</td>
</tr>
<tr>
<td>2</td>
<td>High</td>
<td>Low</td>
<td>Rapid growth</td>
</tr>
<tr>
<td>3</td>
<td>Low</td>
<td>Low</td>
<td>Stable (or shrinking)</td>
</tr>
</tbody>
</table>
India: 2025

Population (in millions)

Source: U.S. Census Bureau, International Data Base.
India: 2050

Source: U.S. Census Bureau, International Data Base.
Percentage of Older Persons (60+): 1950-2050

MIPH Team

• Prof. Robert Cumming
• Prof. Heather Jeffery
• A/Prof. Michael Dibley
• Dr. Mu Li, Senior Lecturer
• Dr. Cynthia Hunter, Lecturer
• Dr. Giselle Manalo, Lecturer
• Mr. Joel Negin, Lecturer
• Mrs. Paula Tansi and Mrs. Priyanthi Abeyratne, Administrative Assistants
MIPH Enrollments
Top 10 Countries

- Australia 372
- USA 46
- China 43
- Canada 26
- Bangladesh 20
- India 19
- Pakistan 12
- Vietnam 11
- Kenya 10
- Uganda 10
Nutrition Research (MIPH Team)

- Obesity in China
- Antenatal vitamin supplements in China
- Maternal nutrition in Indonesia
- Iodine deficiency in Pacific
Overweight/Obesity in Children 7-17 Yrs from 9 Provinces in China

Overweight/Obesity defined using International Obesity Task Force criteria

Data source: China Health and Nutrition Survey (CHNS)
Urinary Iodine Excretion in School Children, Tanna, Vanuatu

Median: 49mcg/L
Other Research Projects (MIPH Team)

- Communication between clinicians in Jakarta
- Health system financing in Pacific
- Mortality in older people in Kenya
- Neonatal mortality in Indonesia
- Pesticide poisoning in Sri Lanka
Neonatal Mortality in Java
Qualitative Study

“… the problem is we do not have any money. Not because we did not want to be assisted by the midwife.” (Mothers)

“In this village the traditional birth attendant is the person from whom we will seek help first.” (Fathers)

“If I find it too difficult to manage, then I will start calling the midwife. Otherwise I don’t think it is necessary.” (Traditional Birth attendants)
## Causes of Death in Western Kenya
### Age 50 years and Over

<table>
<thead>
<tr>
<th>Cause of death</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV/AIDS</td>
<td>17%</td>
</tr>
<tr>
<td>Respiratory infection</td>
<td>12%</td>
</tr>
<tr>
<td>Cardiovascular disease</td>
<td>12%</td>
</tr>
<tr>
<td>Cancer</td>
<td>9%</td>
</tr>
<tr>
<td>Malaria</td>
<td>8%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>6%</td>
</tr>
<tr>
<td>Diarrhoea</td>
<td>6%</td>
</tr>
</tbody>
</table>

Source: Negin et al (unpublished)
Deaths due to HIV/AIDS and Cardiovascular Disease, Western Kenya

![Bar chart showing the percent of deaths due to HIV/AIDS and CVD/Diabetes by age group.

- 50-59 age group: HIV/AIDS - 35%, CVD/Diabetes - 10%
- 60-69 age group: HIV/AIDS - 25%, CVD/Diabetes - 15%
- 70-79 age group: HIV/AIDS - 20%, CVD/Diabetes - 20%
- 80+ age group: HIV/AIDS - 10%, CVD/Diabetes - 30%]
Research on Ageing in Australia
A/Prof Susan Quine

• Fellow of the Australian Association of Gerontology
• Editor-in-Chief of the Australasian Journal on Ageing 2005-9

Apologies for absence - away presenting at the British Society of Gerontology annual conference in UK
Previous Research on Ageing
(using quantitative and/or qualitative methods)

- Prevention of hip fracture (RCT)
- Adherence with hip protectors (RCT)
- Food insecurity (NSW survey)
- Dental and mental health (NSW survey)
- Hopes and fears (Quant. and Qual.)
- Cultural variation in medication use (Qual.)
- Issues around retirement (Qual.)
Current Research on Ageing
Sue Quine

• A qualitative study to identify ways to improve the quality of life of residents of aged care facilities
  – Focusing on both the built environment (building design and setting) and social factors

• A qualitative study to explore the impact of membership of a Men’s Club on older men’s psychological health and well-being
Are you a man over the age of 70?

Join our world leading study of men’s health

CHAMP
CONCORD HEALTH AND AGEING IN MEN PROJECT

If you are a man aged 70 or older who lives in the Burwood, Canada Bay or Strathfield areas, Concord Hospital doctors invite you to join CHAMP.

To find out more, call Melisa Litchfield on 1800 174 287.

CHAMP is funded by the National Health & Medical Research Council to improve health of older men.
Questionnaires and Examinations

Questionnaires
- Activities of Daily Living (Katz, Rosow-Breslau)
- CAGE (alcoholism screen)
- Duke Social Support Index
- Geriatric Depression Scale
- Goldberg Anxiety Scale
- Independent Activities of Daily Living (OARS)
- Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE)
- International Consultation on Incontinence Questionnaire
- International Prostate Symptom Score (IPSS)
- Neuropsychiatric Inventory (abbreviated)
- Physical Activity Scale for the Elderly (PASE)
- SF12
- Alcohol intake
- Family history (dementia, fractures, prostate cancer)
- Health service use
- Medical history
- Medications
- Sexual and reproductive history
- Smoking history
- Sociodemographics

Examinations
- Balance (static and dynamic)
- Bladder ultrasound (post-void residual)
- Blood pressure (lying and standing)
- Chair stand
- Cognitive function
  - Addenbrooke’s Cognitive Examination
  - Colour, sort, form
  - Logical memory (story)
  - Mini Mental State Examination (MMSE)
  - Trails B
- Dual Energy X-ray Absorptiometry (DEXA)
  - Body composition
  - Hip and spine BMD
  - Lateral vertebral morphometry
- Gait (video)
- Grip strength
- Heart rate
- Heel ultrasound
- Height and weight
- Quadriceps strength
- Spirometry (FEV1)
- Urowflow
- Vision (acuity, contrast sensitivity, depth perception)
- Walking speed/steps (6 metre walk)
Blood Tests

Blood Tests (fasting)
• Albumin
• Calcium, phosphate
• Cholesterol (total and HDL)
• Creatinine, urea
• Electrolytes
• Full blood count
• Glucose
• Liver function tests (bilirubin, ALP, GGT, ALT)
• Prostate Specific Antigen (optional)
• Triglycerides
• Bone turnover markers
• PTH
• Reproductive hormones (estrogen, FSH, LH, SHBG, testosterone)
• Vitamin D
• Stored blood for DNA, biomarkers of ageing
Falls Prevention in Hospitals
POPI Study 2003-2006

24 aged care wards in 12 Sydney hospitals
Total patients  n=3999

12 intervention wards
2047 patients
Falls in hospital

12 control wards
1952 patients
Falls in hospital
Results: Relative Risk of Falls
POPI Study of Falls in Hospital

<table>
<thead>
<tr>
<th></th>
<th>Incidence rate ratio</th>
<th>95% CI</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unadjusted</td>
<td>1.02</td>
<td>0.70-1.48</td>
<td>0.93</td>
</tr>
<tr>
<td>Adjusted for past falls</td>
<td>0.96</td>
<td>0.72-1.28</td>
<td>0.79</td>
</tr>
</tbody>
</table>

Source: Cumming et al. BMJ 2008;336:758-60
Exercise for Falls Prevention: A Systematic Review

LEADING THE GLOBAL FIGHT AGAINST CHRONIC DISEASE AND INJURY
Leading causes of death
2002-2030

Chronic diseases and injuries

Millions of deaths

2002  2030

0  20  40  60
A strong base in China

- Established The George Institute, China, based in Beijing
- Partnership with Peking University Health Science Center
- Significant local research capacity and expertise
- Established the first centre for chronic disease in China
- Large studies conducted and research network of Chinese hospitals established

Key research areas:
- ROAD SAFETY
- CARDIOVASCULAR DISEASE
- STROKE
- OBESITY
A strong base in India

- Established The George Institute, India based in Hyderabad
- Significant local research capacity and expertise
- Collaborations with major Indian health bodies to improve health in rural areas
- Partnership with Indian Council of Medical Research

Key research areas:
INJURY
CARDIOVASCULAR DISEASE
HEALTH SYSTEMS
Seat belt intervention saving lives in China

- Utilised a unique blend of science and practical approaches including enhanced law-enforcement practices, extensive social marketing and health education
- Resulted in more than 20% increase in seat belt use
- Demonstrated how simple, cost-effective strategies can save lives in populous regions

With the human toll alone from road traffic injuries in China around 100,000 deaths per year, there is an urgency to implement such interventions in major cities.
Large-scale rural health initiative in India identifies leading causes of death & disability

- A collaboration undertaken in Andhra Pradesh, India aims to identify the main health problems and develop evidence-based methods of addressing them.

- Found that chronic disease and injuries were the leading causes of death in the region, demonstrating the rapid growth of these conditions in developing countries.

The findings from the APRHI program clearly indicate the new health problems that much of rural India will face in the next decade.
Flagship studies

Review of global investment into new products for neglected diseases: G-FINDER

- Tracking global funding into new products for neglected diseases of developing countries
- The first review found funding for neglected diseases was US$ 2.5 billion, but big killer diseases were underfunded
- Many significant diseases in developing countries (pneumonia and diarrhoeal diseases) collectively received less than 6% of total funding.

Funded by the Gates Foundation, this survey provides funders with powerful evidence to help them better target their research and development funds.
The George Institute, China

Current Research Projects

C-WASH
• China Division of World Action on Salt and Health

Tobacco Control
• Priority-driven research agenda (Prof. Simon Chapman)

School-based obesity prevention
• Peer education approach among adolescents
• Pilot study of 4 schools in Beijing only

Behavioral Intervention in Urban China
• Diet and physical activity
• Chronic care model: community-based, tech-assisted
Current Research Projects

APRHI

• To precisely and reliably determine the leading causes of death in the population

Atherosclerosis substudy

• To determine the prevalence of subclinical atherosclerosis (intima-media thickness) in Indian populations and compare with an Australian population
• To investigate cross-sectional associations with atherosclerotic disease

Poly Pilot
The Future
Vision Statement

To conduct high quality research that will influence policy and practice to improve the health of people living in low and middle income countries throughout the world.
Applications for Research in 2010

• Avian flu in Indonesia (Cynthia Hunter)
• Diabetes in Cambodia (Bob Cumming)
• Disability in China, India, Brazil and Uganda (The George and Bob Cumming)
• Infant feeding in Bangladesh (Michael Dibley)
• NCD control in Kenya (Joel Negin)
New University Centres

• Institute for Emerging Infections (IEI)
• Africa Australia Centre (AfrAC)
**Child Deaths**

<table>
<thead>
<tr>
<th>WHO Region</th>
<th>Number of Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>0.26 million</td>
</tr>
<tr>
<td>Americas</td>
<td>0.44 million</td>
</tr>
<tr>
<td>Western Pacific</td>
<td>1.0 million</td>
</tr>
<tr>
<td>Eastern Med.</td>
<td>1.4 million</td>
</tr>
<tr>
<td>South East Asia</td>
<td>3.1 million</td>
</tr>
<tr>
<td>Africa</td>
<td>4.4 million</td>
</tr>
</tbody>
</table>

50% of deaths in 6 countries: India, Nigeria, China, Pakistan, DR Congo, Ethiopia

Sources: Lancet 2003; 361:2226-34, 2005; 365: 1147-1152
## Maternal Deaths

<table>
<thead>
<tr>
<th>UNICEF Region</th>
<th>Number of Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrialised countries</td>
<td>830 (&lt;1%)</td>
</tr>
<tr>
<td>Eastern Europe, Russia etc</td>
<td>2,600 (&lt;1%)</td>
</tr>
<tr>
<td>Latin America/Caribbean</td>
<td>15,000 (3%)</td>
</tr>
<tr>
<td>Middle East, North Africa</td>
<td>21,000 (4%)</td>
</tr>
<tr>
<td>East Asia/Pacific</td>
<td>45,000 (8%)</td>
</tr>
<tr>
<td>South Asia</td>
<td>187,000 (35%)</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>265,000 (49%)</td>
</tr>
</tbody>
</table>

## The State of Africa

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>Bottom 20 No. in Africa</th>
<th>Bottom 40 No. in Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP per capita</td>
<td>18</td>
<td>32</td>
</tr>
<tr>
<td>Human Development Index</td>
<td>20</td>
<td>35</td>
</tr>
<tr>
<td>Infant mortality rate</td>
<td>19</td>
<td>33</td>
</tr>
<tr>
<td>Life Expectancy</td>
<td>19</td>
<td>37</td>
</tr>
</tbody>
</table>