
Uniting Laboratory Science, Policy and Implementation

Peter Lamptey

Distinguished Scientist/President Emeritus, FHI360

Prof. of Non-communicable Diseases, LSHTM

Outline

- Introduction: The Lancet Commission
- Role of FHI360 in Laboratory Medicine in SSA
- Evolving disease burdens in LMIC
- Public Health response in NCD
- Future role of the laboratory in NCD
- Conclusions

Introduction

The Lancet Commission on the Future
Health of Africa

Balancing the Development Agenda in Africa

- Challenging developmental issues – poverty, population growth, rapid urbanization
- Growing economies & economic disparities
- Unfinished health agenda – infectious diseases, nutrition, MCH, SR/H, diarrhea etc.
- Civil conflicts – Sudan, CAR, Somalia
- Emerging new burdens
 - Newer diseases - Ebola
 - Climate change, environmental degradation
- NCD – diseases of the present and future

FHI360 Integrated Development Approaches

FHI360 has strengthened laboratory services in Africa to support research and programs in order to influence policy

FHI 360 Laboratory Sciences in Africa

FHI 360 works with laboratories that serve public and private health programs as well as research activities in Africa

- Supports over *300 laboratories* across the Africa region
- Supports regional laboratory services in Bangkok
- Conducted over *100 laboratory trainings* across Africa
- Pioneered innovative testing services in SSA





THE NCD BURDEN

UNITING POLICY, PROGRAMS AND
LABORATORY SCIENCE FOR AN IMPROVED
RESPONSE

Non-communicable Diseases in LMIC

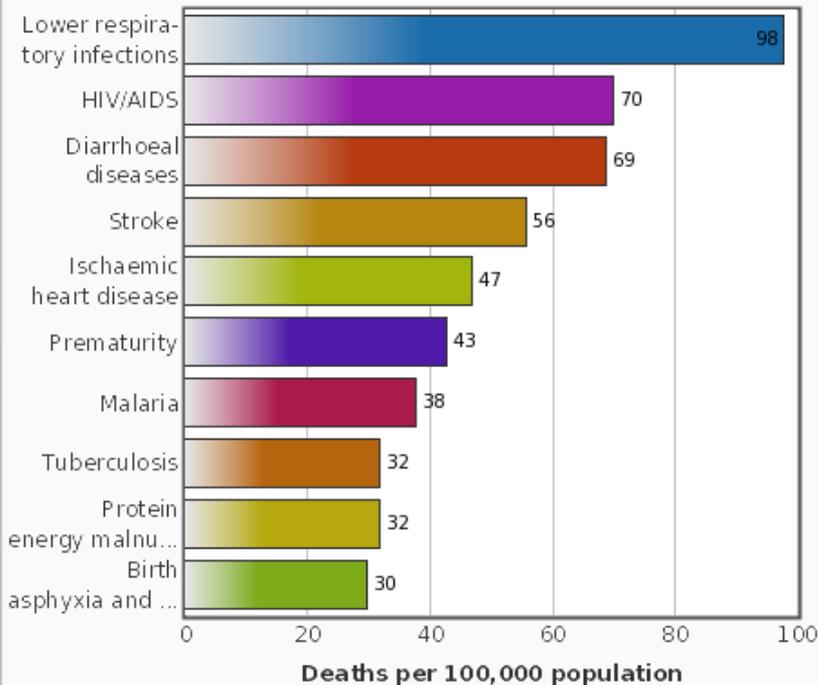
We have acquired the so-called diseases of the wealthy but without the wealth

NCD Epidemics in LMIC

- 80% of NCD deaths occurred in low- and middle-income countries (LMIC) in 2011 [26 Million/ 36 Million]

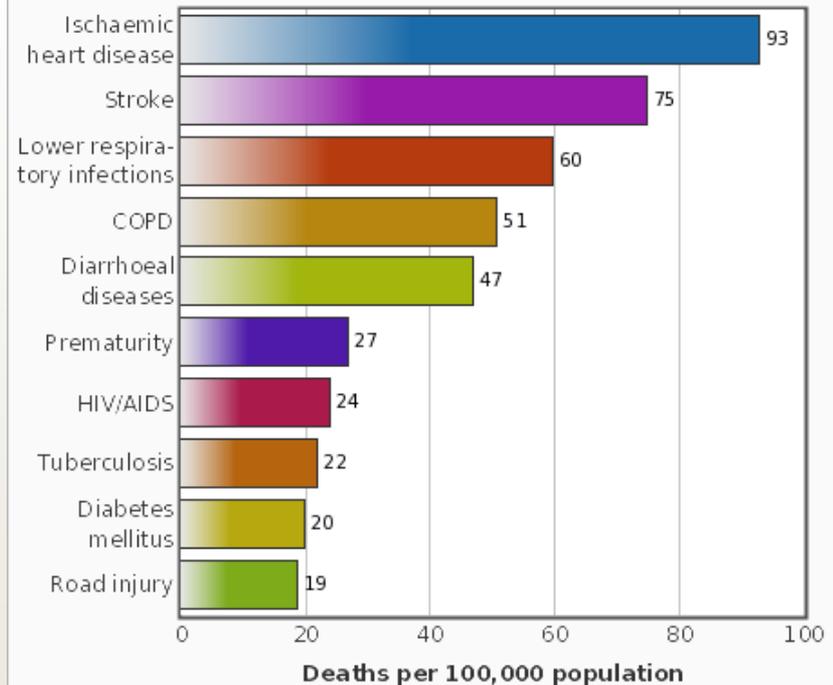
Top 10 causes of death in low-income countries

2011

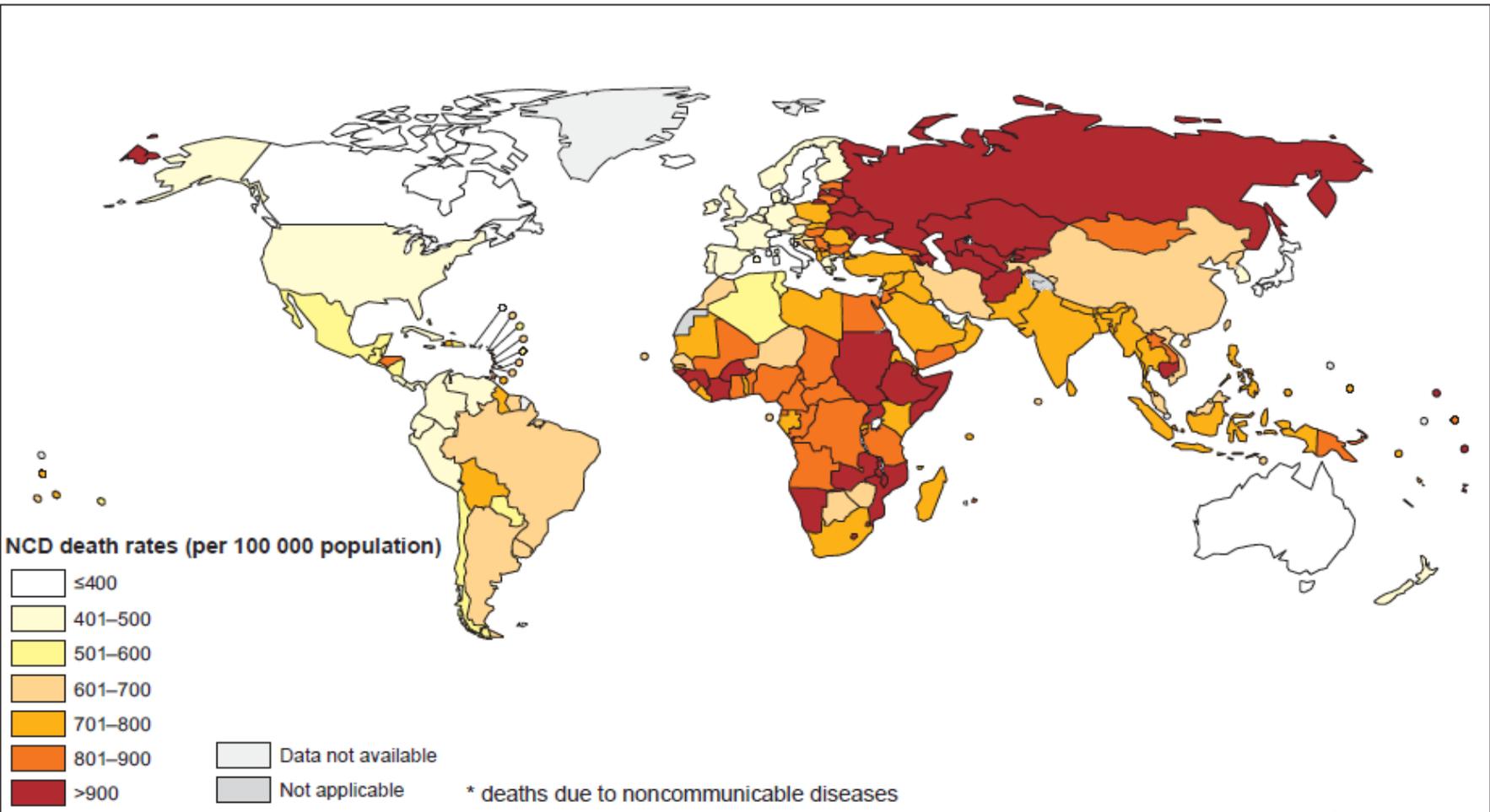


Top 10 causes of death in lower-middle income countries

2011



Total NCD death rates*, age standardized Males, 2008



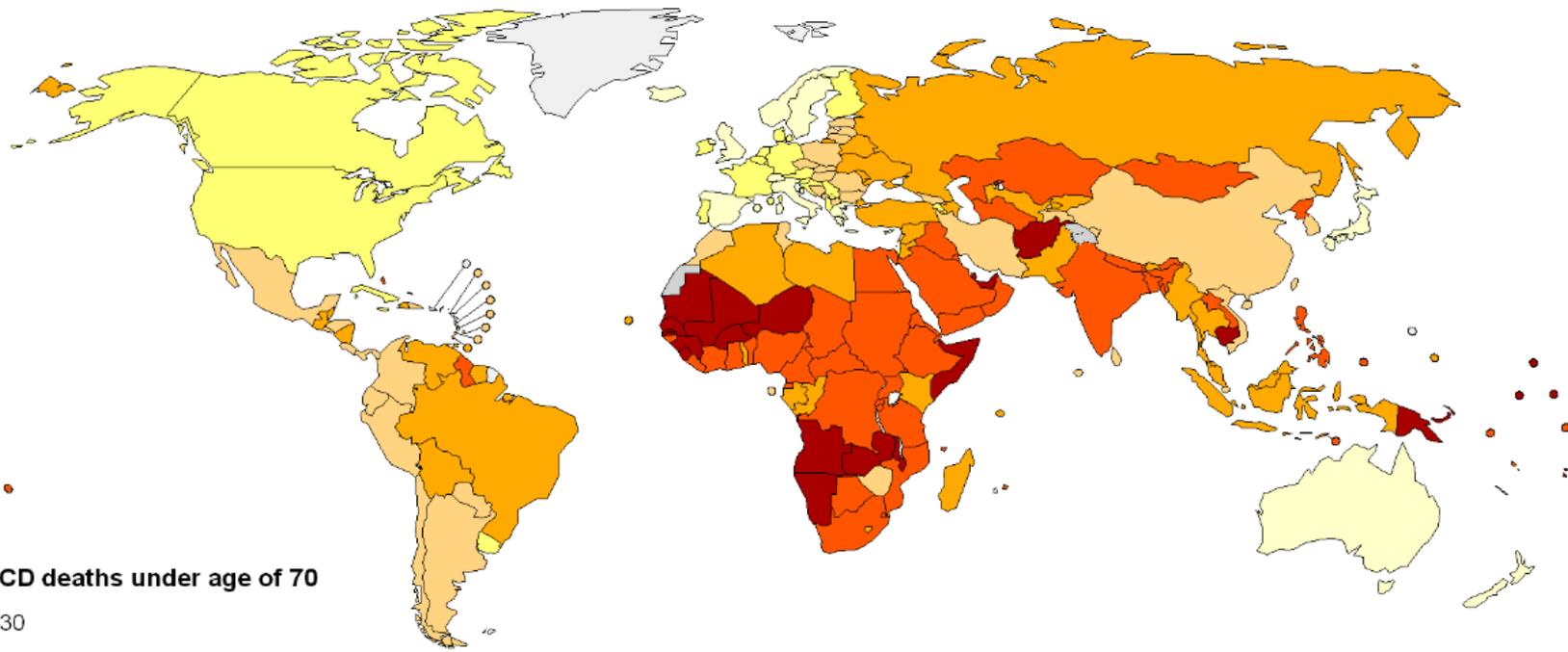
The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers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

Data Source: World Health Organization
Map Production: Public Health Information and Geographic Information Systems (GIS)
World Health Organization

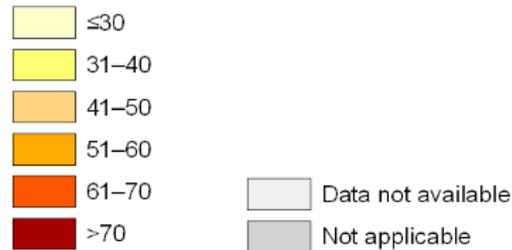


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Percentage of all NCD deaths* occurring under age of 70 Males, 2008



% all NCD deaths under age of 70



* deaths due to noncommunicable diseases

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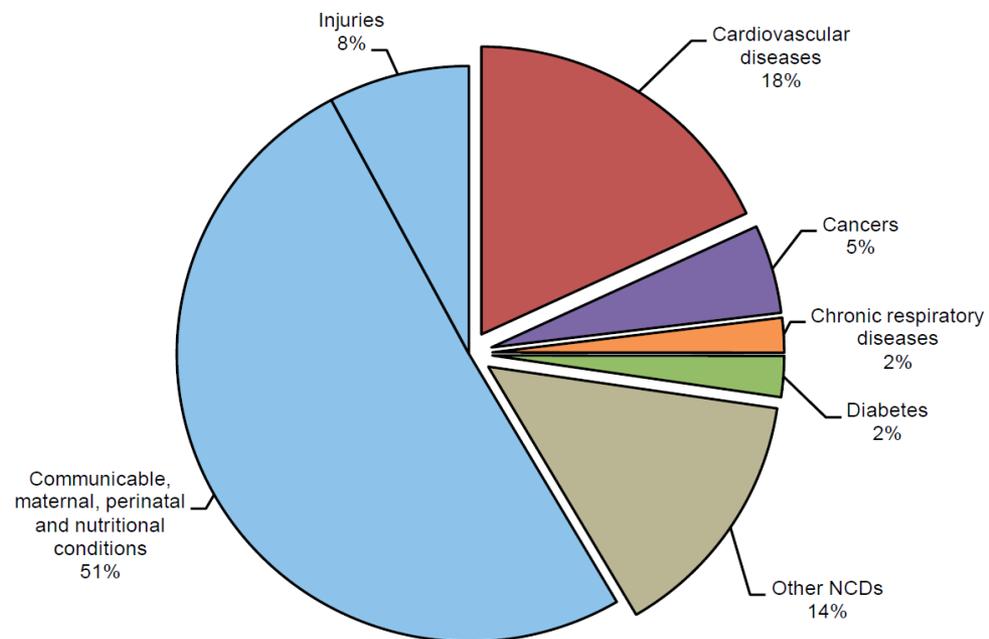
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By 2030, 4 out of 5 premature NCD deaths will occur in LMIC

Ghana: NCD Situation

- Current tobacco smoking (2011) = 10%
- Raised blood pressure (2008) = 27.3%
- Obesity (2008) = 7.5%
- The probability of dying between ages 30 and 70 years from the four main NCDs is 20%

Proportional mortality (% of total deaths)



NCDs are estimated to account for 42% of total de

Ref: WHO. Noncommunicable diseases country profiles 2014.

Biological Risk Factor Assessment Highlights 2012

- **Elevated blood pressure**
 - **33%** of adults (18+yrs) had elevated BP
 - **42%** of urban adults and **27%** of rural adults had elevated BP
 - among those in the 46-60 yrs. age group, **55%** had elevated BP
- **Body Mass Index**
 - **33%** of men and **57%** of women were either overweight or obese (BMI > 25)
 - **53%** of urban adults and **44%** of rural adults were either overweight or obese (BMI > 25)

What is unique about the NCD Burden?

- High prevalence in both the rich and the poor
- Often undiagnosed until late
- Chronic in nature - requires treatment and monitoring for many years
- Physician & facility-based management inadequate
- High out-of- pocket costs leads to catastrophic economic consequences for many families
- High economic costs to the country
- NCD (and ageing) will devastate the health infrastructure

Challenges to medical laboratory services

- Inadequate capacity to meet needs
- Limited accessibility/availability
- Inadequate resources to achieve international quality standards
- Cost to patient
- Long wait for results
- Current & future laboratory infrastructure inadequate to meet clinical and public health needs

We need a paradigm shift for an adequate response

Diabetes as a case study: A Challenge for
Policy, Laboratory Science &
Implementation

Type 2 diabetes mellitus: The US Experience*

- Increasing level of obesity and ageing
- 13% of US adults (25.8M) have T2DM
- 40% of these are undiagnosed in a physician-based system
- Seven year lag between onset of symptoms & diagnosis
- Additionally, 35% of US adults (79M) have pre-diabetes
- 93% of pre-diabetes in the US is undiagnosed

* *John McKinley et al., NERI*

T2DM Parallel in SSA

- Increasing level of obesity and ageing
- Increasing level of T2DM and pre-diabetes
- Late diagnosis, poor adherence to treatment and high mortality
- Poor data on proportion of undiagnosed T2DM and pre-diabetes
- Inadequate health system with severe shortages in personnel, equipment and infrastructure
- Facility-based medical and laboratory response inadequate

“If you always do what you’ve always done, you’ll always get what you’ve always got”.

Advocacy for population-based screening
of those at high risk of NCD

Criteria for Population-based Screening

Condition should be/have:

- An important health problem
- Natural history should be understood
- Latent or asymptomatic stage
- Accurate, reliable & affordable test be available
- Community-based testing preferable
- Treatment should effective & cost-effective when started early
- Timely policy and funding decisions

Screening lessons learned from HIV

- Well-established population-based screening with RDT
- Targeted screening of MARPS or key populations have been successful
- Virtual elimination of mother to child HIV transmission in many populations
- Early diagnosis and treatment of HIV disease
- Proven effectiveness and cost-effectiveness in prevention and treatment

FHI 360 Community-Based Malaria program in Ghana

- Licensed Chemical Sellers are private drug shops operated by non-pharmacists who are licensed to sell over-the-counter medicines
- FHI 360 trained 1207 LCS to use Rapid Diagnostic Test kits to diagnose & treat uncomplicated malaria with ACTs
- Refer serious cases of malaria and pregnant women
- Improved access to care, improve efficiency and reduced case load at health facilities
- Funded by GlaxoSmithKline



Population-based screening & management of NCD

- Cardiovascular disease – risk factors such as:
 - Hypertension
 - Cholesterol
 - Blood glucose & HbA1c
- Cervical cancer – HPV immunization & screening e.g. VIA,
- Liver disease – HBV, HCV
- Stomach cancer – H. pylori
- Chronic respiratory disease – asthma
- Haemoglobinopathies - Sickle cell disease

Future Considerations

The Role of Technology in the Public
Health Response

Technology applications



Scanadu's Medical Tricorder



The Tricorder: Science fiction or the future?

- A non-invasive portable device that senses, computes and records personal health metrics
- “Diagnose patients as well as or better than a panel of board-certified physicians”
- Allows the patient to decide when, where & how to receive care
- \$10M Qualcomm X-prize by Qualcomm Foundation
- Announced in 2012 and prize to be awarded in Jan 2016
- Are we headed for a radical change in health care delivery (similar to the internet & smart phones?)

FDA Approved Digital Pill



The Edible Electronic Pill: Improving Adherence in NCD

- Edible electronic sensor in a pill that keeps track of medication patterns
- Sensor transmits data to a patch on the skin to external online apps.
- It determines time of ingestion, heart rate, body position and physical activity
- Data can be used to monitor and improve health behaviors and patterns
- May also be used in research to assess compliance to treatment

Conclusions

- Improved prevention and treatment of current and emerging disease burdens
- Population-based screening of those at high risk
- Effective technologies to revolutionize implementation and laboratory services
- Support self-management especially in NCD
- Bring back the evidence in our programs – we waste resources on too many unproven interventions

We Need a Paradigm Shift for the Future Public Health Response

We need to shift testing from the lab & treatment from the doctor's office to the community

THANK-YOU!!