

NCDS IN TANZANIA

Dr Mwele Ntuli Malecela
Director General
National Institute for Medical Research

Outline

- ✓ Burden of NCD
- ✓ NCD Surveillance
- ✓ Challenges
- ✓ Opportunities

Tanzania



Demographics	Tanzania
Area (sq km)	945,100
Population	43,000,000 25% urban
GNP per capita	US \$240
Human Development Index	0.358 (150/174)
Literacy rate	Male: 84% Female: 65.7%
Infant mortality rate	51 per 1,000
Life expectancy	56 years

Burden of risk factors....1

- Prevalence of Tobacco smoking is 10%
- Overweight 21.8%
- Raised total cholesterol 21.6%
- Raised blood glucose 8.5%
- Per capita consumption of pure alcohol 7.8 L

Burden of NCD.....2

- NCD mortality is 75.7males/100,000 people
- Prevalence of DM IS 5.3%, Hypertension 30%
- Chronic obstructive pulmonary disease 12.6%
- Incidence of cancers is 21.2/100,000 population with carcinoma cervix being being the commonest (Mchembe per comm: Younger persons presenting with severe forms of colon cancer).
- ⦿ 8000 to 10,000 children are born every year in Tanzania with Sickle cell anaemia
- There are 400,000 patients requiring dialysis

NCD interventions...1

National Strategy for NCD - 2009

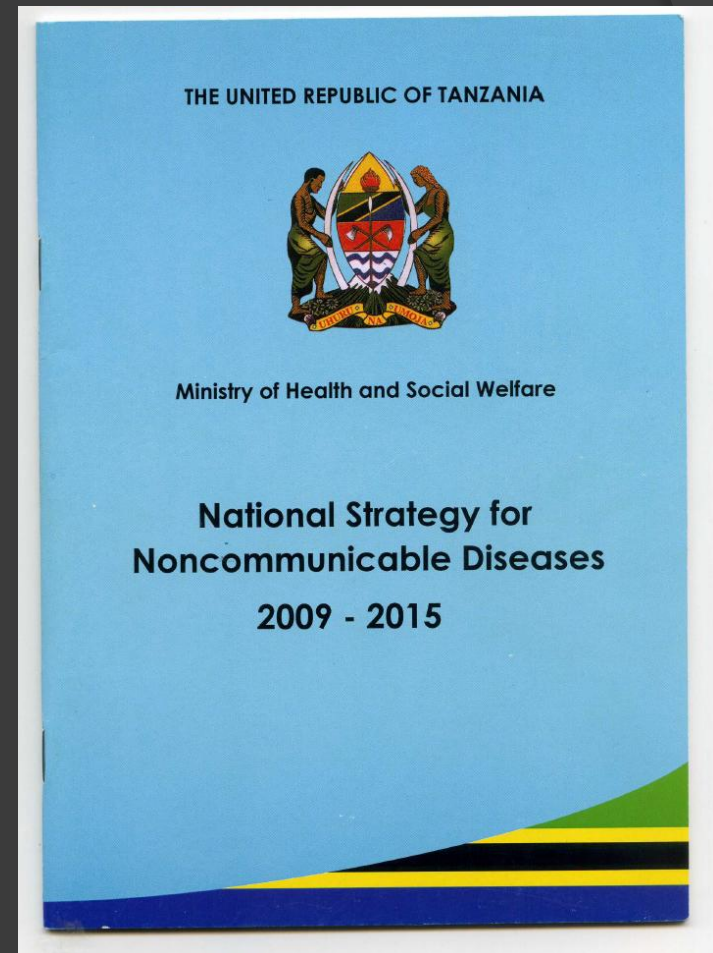
This sets the governments action on NCD prevention and control. Forms an integral part of HSSP III

Time frame 2009 – 2015

Funding MOHSW –MTEF

Goal – To reduce burden of NCD

Aim – Ensure access to affordable NCD services



Objectives of the National NCD Strategy

- Strengthen NCD leadership and management
- Strengthen NCD related legislations
- Health Promotion; increase awareness for NCDs
- Strengthen Capacity for NCD care at all levels
- **Strengthen Research, Surveillance and M&E**

E. Promote NCD research

Provide data for planning

- Support NCD research through NIMR, MUHAS
- Masters degree in field epidemiology course now has track on NCD has run by MUHAS, NIMR & MOHSW- Two interns are currently enrolled in the 2011 cohort.

**Tanzanian scientist wins Royal Society Pfizer Award
for Sickle Cell Disease research
15 September 2011**

F. Monitoring, evaluation and surveillance

- Early studies by the Adult Morbidity and Mortality Project showed that NCD's were a major problem in both urban and rural areas of Tanzania. The study also pointed out associated risk factors
- NIMR is currently piloting an NCD surveillance plan supported by International Association of National Public Health Institute (IANPHI)-**Activities on going to strengthen NCD surveillance from health facility data and risk factor assessment in the community,**
- MoHSW is currently revising HMIS (MTUHA) to incorporate NCDs
- STEP SURVEY of NCD risk factors, 2nd round in 2011 supported by DANIDA and WHO

Challenges....

- We have a double burden of disease
- Clearer links between communicable and Non communicable diseases.
- NCDs not yet a priority, priority is still given to infectious disease programs in resource allocation but there has certainly been more advocacy.
- Other major NCDs, mental health, hemoglobin disorders, injuries and violence are areas that need to be targeted
- The availability of affordable essential medicines and technologies for NCD

Diabetes Is a Risk Factor for Pulmonary Tuberculosis: A Case-Control Study from Mwanza, Tanzania

Daniel Faurholt-Jepsen^{1*}, Nyagosya Range², George PrayGod³, Kidola Jeremiah³, Maria Faurholt-Jepsen¹, Martine Grosos Aabye⁴, John Changalucha³, Dirk Lund Christensen^{5,6}, Christian Bressen Pipper⁷, Henrik Krarup⁸, Daniel Rinse Witte⁹, Aase Bengard Andersen⁷, Henrik Friis¹

1 Department of Human Nutrition, University of Copenhagen, Frederiksberg, Denmark, **2** Muhimbili Research Centre, National Institute for Medical Research, Dar Es Salaam, Tanzania, **3** Mwanza Research Centre, National Institute for Medical Research, Mwanza, Tanzania, **4** Clinical Research Centre, University of Copenhagen, Hvidovre Hospital, Hvidovre, Denmark, **5** Department of International Health, University of Copenhagen, Copenhagen, Denmark, **6** Steno Diabetes Center, Gentofte, Denmark, **7** Department of Basic Sciences and Environment, University of Copenhagen, Frederiksberg, Denmark, **8** Department of Clinical Biochemistry, Aalborg University Hospital, Aalborg, Denmark, **9** Department of Infectious Diseases, Odense University Hospital, Odense, Denmark

Abstract

Background: Diabetes and TB are associated, and diabetes is increasingly common in low-income countries where tuberculosis (TB) is highly endemic. However, the role of diabetes for TB has not been assessed in populations where HIV is prevalent.

Methods: A case-control study was conducted in an urban population in Tanzania among culture-confirmed pulmonary TB patients and non-TB neighbourhood controls. Participants were tested for diabetes according to WHO guidelines and serum concentrations of acute phase reactants were measured. The association between diabetes and TB, and the role of HIV as an effect modifier, were examined using logistic regression. Since blood glucose levels increase during the acute phase response, we adjusted for elevated serum acute phase reactants.

Results: Among 803 cases and 350 controls the mean (SD) age was 34.8 (11.9) and 33.8 (12.0) years, and the prevalence of diabetes was 16.7% (95% CI: 14.2; 19.4) and 9.4% (6.6; 13.0), respectively. Diabetes was associated with TB (OR 2.2, 95% CI: 1.5; 3.4, $p < 0.001$). However, the association depended on HIV status (interaction, $p = 0.01$) due to a stronger association among HIV uninfected (OR 4.2, 95% CI: 1.5; 11.6, $p = 0.01$) compared to HIV infected (OR 0.1, 95% CI: 0.01; 1.8, $p = 0.13$) after adjusting for age, sex, demographic factors and elevated serum acute phase reactants.

Conclusion: Diabetes is a risk factor for TB in HIV uninfected, whereas the association in HIV infected patients needs further study. The increasing diabetes prevalence may be a threat to TB control.

Citation: Faurholt-Jepsen D, Range N, PrayGod G, Jeremiah K, Faurholt-Jepsen M, et al. (2011) Diabetes Is a Risk Factor for Pulmonary Tuberculosis: A Case-Control Study from Mwanza, Tanzania. PLoS ONE 6(8): e24215. doi:10.1371/journal.pone.0024215

Editor: Niyaz Ahmed, University of Hyderabad, India

Received: May 1, 2011; **Accepted:** August 3, 2011; **Published:** August 30, 2011

Copyright: © 2011 Faurholt-Jepsen et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Funding: This study was supported by the Danish Council for Independent Research - Medical Sciences (grant 22-04-0404), by Danida through the Consultative Research Committee for Development Research (104.Dan.8-898) and the University of Copenhagen through the Cluster in International Health. The funding bodies had no role in the study design, data collection, data analysis, data interpretation or decision to publish the findings.

Competing Interests: The authors have declared that no competing interests exist.

* E-mail: dfa@life.ku.dk

Introduction

The number of people living with type 2 diabetes mellitus (diabetes) is projected to double between 2000 and 2030, based on increasing life-expectancy and urbanization [1]. Furthermore, the incidence of diabetes seems to continue to increase [2,3], due to continuing changes in life-style [4,5].

There is evidence to suggest that diabetes increases the risk of lower respiratory tract and other infections [6–8]. The mechanisms are not clear, but may be through impaired cell-mediated immunity [3] as well as neutrophil function [9–11]. Such effects are likely to be particularly detrimental in low-income countries, where diabetes usually remains undiagnosed or untreated due to weak health systems [12], and may occur in individuals with high exposure to tuberculosis (TB) and other infectious diseases.

More than 9 million people are diagnosed with TB each year, with HIV infection and undernutrition as well-established risk factors [13]. Studies primarily from middle and high-income countries suggest that diabetes is in fact associated with increased risk of TB. However, any effect of diabetes on risk of TB and other infections is of greater concern in low-income countries. If indeed diabetes is a risk factor for primary infection with TB or progression from latent TB infection to active TB disease, then increasing diabetes prevalence in TB endemic areas will further increase the TB burden. Yet, in high TB burden countries little is known about the prevalence of diabetes, and, as recently reviewed [14], no studies on the role of diabetes for TB have been carried out in Africa. Hence, the effect of diabetes on risk of TB has not been assessed in a population with a high prevalence of HIV, a known strong competing risk factor.

Opportunities

- High level advocacy of NCD's
- Increase in critical mass of researchers
- Recognition of links between Communicable and Non Communicable Diseases.
- Continued work of IANPHI

