Adult Deaths and the Future: Situational analysis of a longitudinal data in a rural southern Tanzania, 2003 - 2007

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Presentation Outline

1. Background
2. Rationale for the study
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Background (1)

- **The achievements of the United Nations' millennium development goals (MDGs) are not possible in isolation.**

- **Adult health and mortality openly missing among MDGs**
  - except maternal health.

- **But eradicating extreme poverty and hunger would not be possible without economically active population**
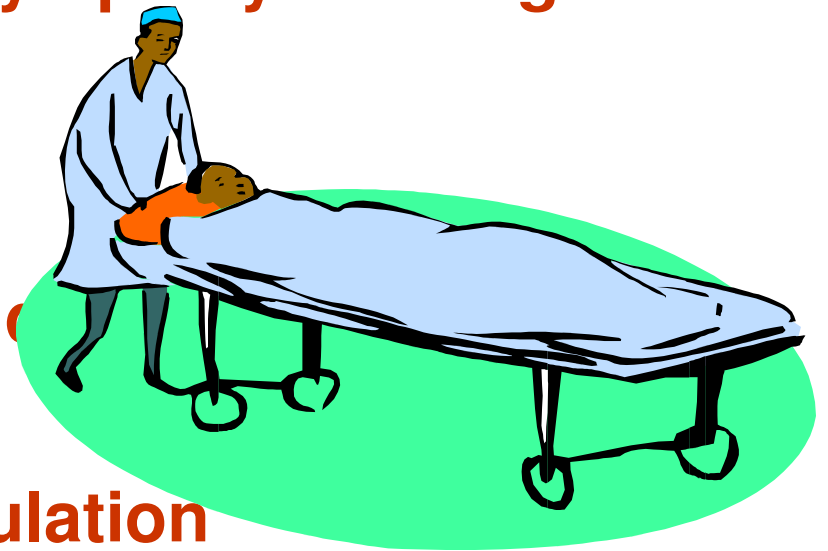
Background (2)

- **Little research has been done on adult health and mortality compared to child health.**

- **Adult mortality is increasing**
  - Partly due to HIV/AIDS

- **Studies proven Adult deaths are expected = or > child deaths in sub-Saharan Africa if nothing is done.**

- **Different factors are associated with different causes of adult deaths within and among different settings.**

Rationale for Study (1)

- **Information on levels, causes and risk factors of adult mortality in sub-Saharan Africa, including Tanzania are not readily available.**

- **About 90% of African countries have no information on cause of death for any year after 1990 –Mathers CD et al (2005)**

- **Objectively, HDSS have increased in Africa and data now available on adult deaths.**

Rationale for Study (2)

- **Tanzania has several Health and Demographic Surveillance sites, however few studies have focused on adult health and mortality**

- **Hence the need to fill the gap and contribute to knowledge to improving adult health.**
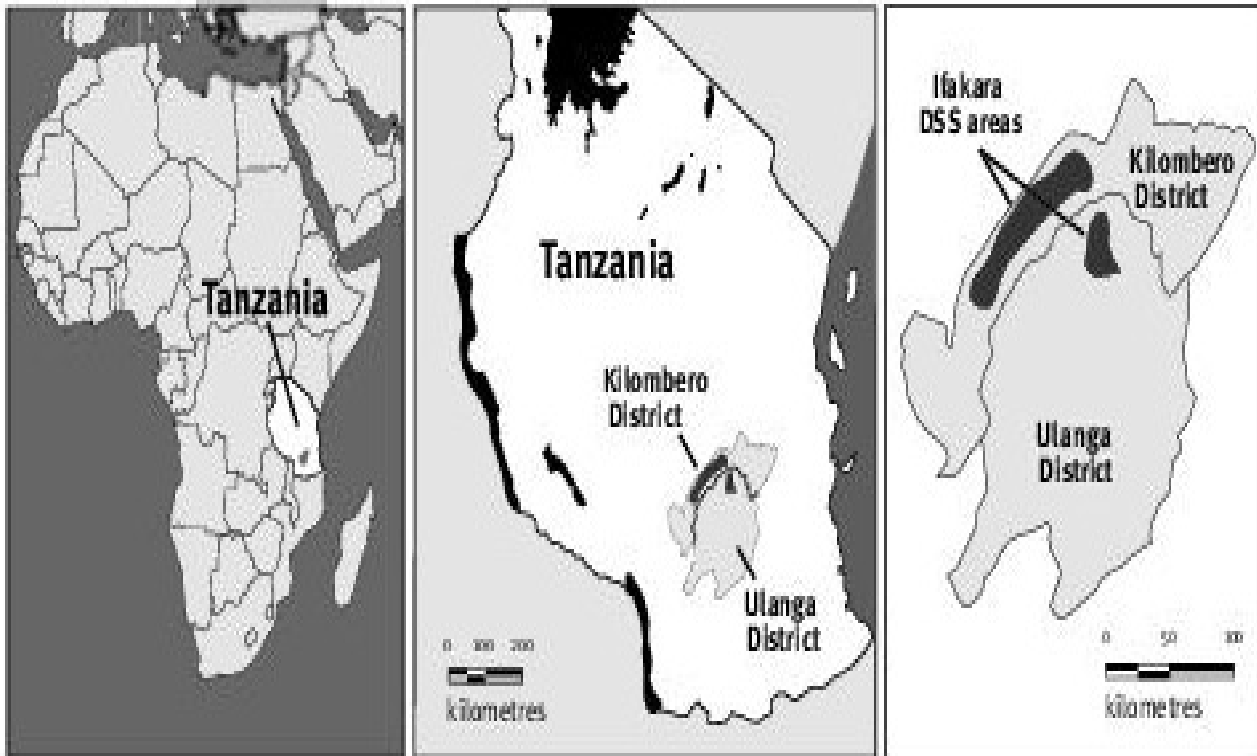
Main Objective

- **To describe causes of deaths and identify risk factors of cause-specific mortality among adults in the IHDSS from 2003 to 2007.**

Methodology (1)

- **Study Area – Ifakara HDS area, Tanzania**

Methodology (2)

- **Study design:**
  - Open cohort study
    - Secondary data analysis of longitudinal dataset
    - 5 years of follow-up from 2003 to 2007

- **Study population:**
  - All adults aged 15 – 59 years within the IHDS area

- **Sample:**
  - All registered adults aged 15 to 59 years in the IHDSS from 1st January 2003 to 31st December 2007

Methodology (3)

- **Analysis:**
  - Socio-demographic factors
  - Death
    - Cause specific deaths
      - Verbal autopsy method was used to ascertain causes of deaths.
      - ICD 10
    - Broad causes – CD, NCD, Accident/Injury and Undetermined

  - Mortality rates were computed per 1000PYO.
  - Cause specific mortality rates were computed in broad causes
  - Cox proportional hazards method
    - to identify socio-demographic factors associated with specific-causes of adult deaths.
- **STATA 10 at 5% significant level**

RESULTS
Characteristics of cohort (1)

- **65,548 adults aged 15-59 yrs were observed**

- **51% (33,677) females**

- **57% (37,564) were 15-29yrs. 30-44 yrs and 45-59 yrs comprised 30% (19,417) and 13% (8,566) of the sample respectively**
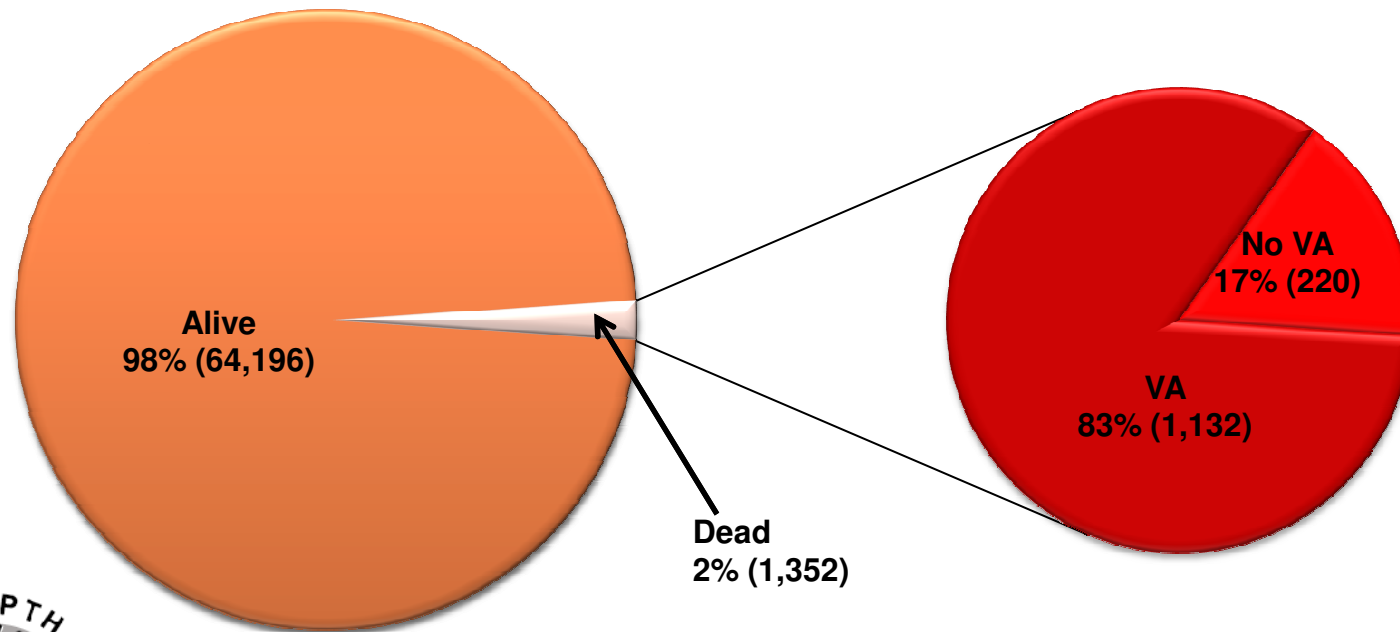
Characteristics of cohort (2)

- **Majority had primary level of education (78% - 51,034), no education, 15% (9,582) and beyond primary, 7% (4,932)**

- **94% (61,728) heads of households employed against 6% (3,820) not employed**

- **64% (41,729) enumerated into HDSS at baseline while 36% (23,819) in-migrated**

- **The average household size was 5 (sd 2.31)**

Adult mortality in the IHDSS, 2003 - 2007

Vital event and VAs for adults , 2003 - 2007

Alive
98% (64,196)

Dead
2% (1,352)

No VA
17% (220)

VA
83% (1,132)

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Causes of Deaths among Adults 15-59 years

- **Overall,**

  - HIV/AIDS related (20% - 231)

  - Malaria (13% - 149), Unintentional injury (5% - 60)

- **Undetermined (30% - 351)**

- **Males aged 15-29yrs – Unintentional injuries followed by malaria and then HIV/AIDS related**

- **All other age group including females 15-29yrs – HIV/AIDS related followed by malaria**

Broad Causes of Deaths among Adults 15-59 years

CD (41%) 460		NCD (20%) 223		Accid/Inj (9%) 98	
HIV/AIDS	50%	AA conditio	22%	Unintent. Inj.	61%
Malaria	22%	Ceresbrova.	9%	Homicide	12%
Pneumonia	6%	Epilepsy	8%	RTA	11%
Others	22%	Others	61%	Others	16%

Adult Mortality Rates and Trend

- **All-cause mortality rate for the period was 7.3 per 1000 person years.**

Overall Annual Adult Mortality Rate for Individuals Aged 15-59 in IHDSS, 2003 to 2007

$y = 0.14x + 7.04$
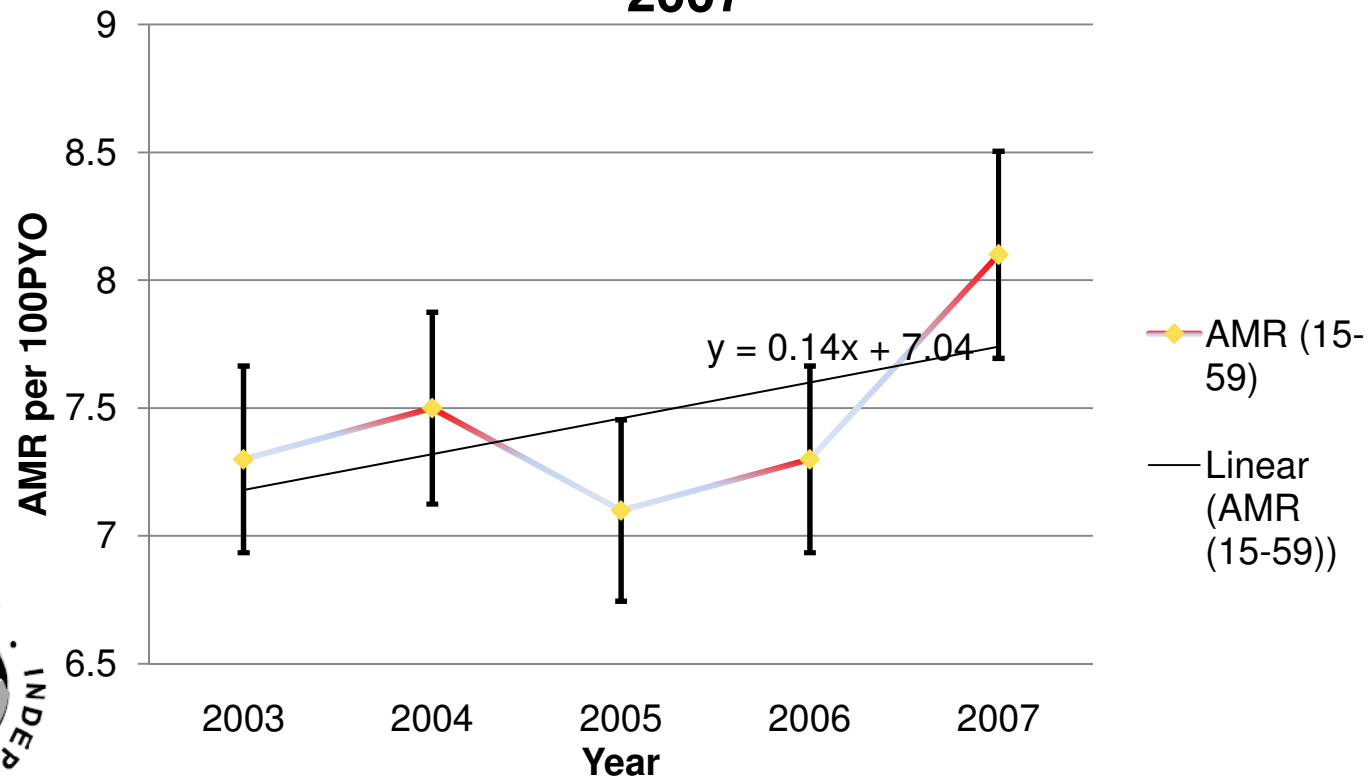
AMR & Trend

- **Broad Causes increased proportionally over the period**

  - Undetermined decreased by 63.7% (35% to 13%)

- **Communicable causes increased by 32.5% (40% to 53%) – CD MR was 2.49/1000py**

- **Non Communicable causes increased by 50% (16% to 24%) – NCD MR was 1.21/1000py**

- **Acc/injury causes increased by 11% (9% to 10%) – Acc/injury MR was 0.53/1000py**

Risk Factors of CD Cause of Deaths in IHDSS, 2003-07

Factors	Univariate Analysis		Multivariate Analysis	
	HR (95% CI)	p-value	HR (95% CI)	p-value
Sex				
Female	Reference		-	-
Male	1.03 (0.86, 1.23)	0.739		
Age				
15-29	Reference		Reference	
30-44	2.40 (1.92, 2.99)	**<0.001**	2.56 (2.05, 3.19)	**<0.001**
45-59	2.99 (2.33, 3.82)	**<0.001**	3.19 (2.49, 4.10)	**<0.001**
SES				
Poorest	Reference		Reference	
Poorer	0.72 (0.53, 0.92)	**0.012**	0.73 (0.55, 0.97)	**0.030**
Poor	0.68 (0.51, 0.92)	**0.011**	0.71 (0.53, 0.94)	**0.023**
Less poor	0.82 (0.62, 1.07)	0.144	0.85 (0.65, 1.11)	0.242
Least poor	0.90 (0.69, 1.18)	0.437	0.93 (0.71, 1.22)	0.617
Level of Education				
No Education	Reference		Reference	
Primary Education	0.48 (0.39, 0.59)	**<0.001**	0.39 (0.21, 1.20)	0.098
Beyond Primary	0.35 (0.21, 0.59)	**<0.001**	0.30 (0.18, 1.07)	0.071
Employment status (head of household)				
Employed	Reference		Reference	
Unemployed	2.09 (1.55, 2.83)	**<0.001**	1.30 (0.86, 1.98)	0.069
Household size	1.30 (1.29, 1.31)	**<0.001**	1.02 (0.97, 1.39)	0.341
Entry Type				
Enumeration	Reference		Reference	
In-migration	1.41 (1.14, 1.75)	**0.001**	1.70 (1.37, 2.11)	**<0.001**

Risk Factors of NCD Cause of Deaths in I HDSS, 2003-07

Factors	Univariate analysis		Multivariate Analysis	
	HR (95% CI)	p-value	HR (95% CI)	p-value
Sex				
Male	Reference		Reference	
Female	1.34 (1.03, 1.76)	**0.030**	1.21 (0.92, 1.59)	0.173
Age (in years)				
15-29	Reference		Reference	
30-44	1.59 (1.14, 2.23)	**0.007**	1.98 (1.44, 2.71)	**<0.001**
45-59	2.78 (1.91, 4.03)	**<0.001**	2.69 (1.90, 3.80)	**<0.001**
SES				
Poorest	Reference			
Poorer	0.76 (0.50, 1.14)	0.187		
Poor	0.91 (0.61, 1.36)	0.645		
Less poor	0.93 (0.63, 1.37)	0.709		
Least poor	0.79 (0.52, 1.19)	0.258		
Level of Education				
No Education	Reference		Reference	
Primary Education	0.55 (0.41, 0.75)	**<0.001**	0.67 (0.49, 0.92)	**0.014**
Beyond Primary	0.09 (0.23, 0.38)	**0.001**	0.11 (0.03, 0.44)	**0.002**
Employment status (head of household)				
Employed	Reference			
Unemployed	1.50 (0.92, 2.47)	0.106		
Household size	1.03 (0.97, 1.12)	0.299		
Entry Type				
Enumeration	Reference			
In-migration	1.15 (0.83, 1.59)	0.406		

Risk Factors of Accident/injury Cause of Deaths in IHDSS, 03-07

Factors	Univariate Analysis		Multivariate Analysis	
	HR (95% CI)	p-value	HR (95% CI)	p-value
Sex				
Female	Reference		Reference	
Male	2.61 (1.69, 4.02)	**<0.001**	2.29 (1.47, 3.55)	**<0.001**
Age (in years)				
15-29	Reference			
30-44	1.21 (0.79, 1.87)	0.377		
45-59	0.92 (0.51, 1.68)	0.801		
SES				
Poorest	Reference		Reference	
Poorer	0.68 (0.39, 1.20)	0.188	0.55 (0.31, 0.98)	**0.042**
Poor	0.61 (0.33, 1.12)	0.110	0.48 (0.26, 0.89)	**0.019**
Less poor	0.52 (0.28, 0.97)	**0.040**	0.45 (0.24, 0.85)	**0.013**
Least poor	0.63 (0.35, 1.15)	0.131	0.12 (0.05, 0.29)	**<0.001**
Level of Education				
No Education	Reference		Reference	
Primary Education	0.55 (0.34, 0.87)	**0.011**	0.64 (0.39, 1.05)	0.078
Beyond Primary	0.43 (0.15, 1.25)	0.121	0.63 (0.21, 1.87)	0.406
Employment status (Head of household)				
Employed	Reference			
Unemployed	1.19 (0.52, 2.73)			
Household size	1.31 (1.29, 1.33)	**<0.001**	1.36 (1.32, 1.40)	**<0.001**
Entry Type				
Enumeration	Reference			
In-migration	1.33 (0.83, 2.12)	0.234		

Limitations of Study

- **High proportion of undetermined underestimated some rates**

- **VA limitations**
  - Recall bias - 40 days mourning period
  - Over-diagnosis
  - Misclassification of causes

- **Inability to investigate other important variables**

- **Assumed independent variables were time invariant – measured at recruitment**

Conclusion

- **HIV/AIDS is the leading cause of adult deaths in IHDSS area followed by malaria.**

- **Adult mortality had increased**

- **The broad causes of death had increased over the period**

- **The cause of death pattern has not changed**

  – 1st CD, 2nd NCD and 3rd Accident/Injury

- **The risk factors of cause-specific mortality among adults within rural area differs**

Recommendation

- **Interventions need to be put in place to avoid being faced with increased triple disease burden**

  – CD, NCD and Accident/Injury

- **For Communicable disease**

  – Scale up interventions on HIV/AIDS and Malaria

- **For Non communicable disease**

  – Increase awareness and information provision on life style and NCD

- **For Accident/Injury**

  – IE&C on preventions

  – Targeting males

    – Effective if based on local evidence and research.

Acknowledgement

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