Burden of Disease and Injuries for Coastal Regions in Tanzania 2008-2011

Summary findings of analysis of cause of death data

Francis Levira, Zoe Hildon and Paul Smithson
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IFAKARA HEALTH INSTITUTE
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Burden of disease among old age (60+)---------------------------------------------16
Burden of disease for all ages---------------------------------------------------17
Discussion------------------------------------------------------------------------17
Age specific mortality rates-----------------------------------------------------18
Broad cause of death-------------------------------------------------------------18
Age specific attributable cause of deaths------------------------------------------18
Trends in malaria, TB and HIV----------------------------------------------------18
Burden of disease and injuries---------------------------------------------------19
Conclusion------------------------------------------------------------------------19
Reference-------------------------------------------------------------------------20

List of Tables
Table 1: Annual cause of death coverage, 2008-2011 -----------------------------4
Table 2: Cause of death coverage by age group, 2008-2011 ----------------------5
Table 3: YLL, percent of YLL and YLL per 1000 by cause for children
under five years of age------------------------------------------------------15
Table 4: YLL, percent of YLL and YLL per 1000 by cause for adults (15-59)-----15
Table 5: YLL, percent of YLL and YLL per 1000 by cause for older ages (60+)----16
Table 6: YLL, percent of YLL and YLL per 1000 by cause for all ages (15-59)-----17

List of Figures
Figure 1: Number of deaths and age specific mortality rates, 2008-2011 ---------6
Figure 2: Distribution of age at death in Rufiji, N=3201------------------------7
Figure 3: Distribution of percent of top 10 cause of death by gender,
Males=1168 and Females=1167---------------------------------------------------9
Figure 4: Distribution of under five deaths, N=627-----------------------------10
Figure 6: Distribution of major cause of death for adults (15-59)
by gender, Males=273 and Females=313,---------------------------------------11
Figure 7: Distribution of causes of death at older ages, N=1004.------------------12
Figure 8: Trends in TB, malaria and HIV by age, 2008-2011----------------------13
Figure 9: YLL and age specific YLL per 1000 person years, 2008-2011.---------14
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIDS</td>
<td>Acquired Immune Deficiency Syndrome</td>
</tr>
<tr>
<td>ARI</td>
<td>Acute Respiratory Infections</td>
</tr>
<tr>
<td>BOD</td>
<td>Burden of Disease</td>
</tr>
<tr>
<td>CVD</td>
<td>Cardiovascular Diseases</td>
</tr>
<tr>
<td>DSS</td>
<td>Demographic Surveillance System</td>
</tr>
<tr>
<td>HDSS</td>
<td>Health and Demographic Surveillance System</td>
</tr>
<tr>
<td>HIV</td>
<td>Human immunodeficiency virus</td>
</tr>
<tr>
<td>ICD</td>
<td>International Classification of Diseases</td>
</tr>
<tr>
<td>TB</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>VA</td>
<td>Verbal Autopsy</td>
</tr>
<tr>
<td>YLL</td>
<td>Years of Life Lost</td>
</tr>
</tbody>
</table>
The purpose of this report is to provide local estimates of risks and Burden of Disease (BOD) and injuries for rural districts of coastal zones in Tanzania for Council Health Management offices and other partners. The estimates are inputs in decision-making process for annual district’s health services planning.

Population distribution of deaths and their causes stratified by age, gender and other risk factors are an important input parameter for priority setting in planning for health care delivery and interventions.

In Tanzania, vital registration and health management information systems are not fully developed to produce reliable information for health planning. The purpose of the report will be achieved through the following objectives:

- Estimate of age specific mortality rates.
- Describe distribution of cause of deaths attributed to communicable diseases, maternal and perinatal conditions, non-communicable diseases and injuries.
- Estimate distribution of cause of death for all ages, children, adults and older ages.
- Estimate recent annual trends of deaths attributed to malaria, TB and HIV.
- Estimate overall and cause specific attributable burden of disease in terms of Years of Life Lost (YLL) due to premature mortality.
- Estimate population burden of disease in terms of Years of Life Lost per population size.

In an effort to address the gap between health planning and available evidence Ifakara Health Institute in 1998 established population based health and demographic surveillance system (HDSS) site in Rufiji District of Coastal Region that monitor among others deaths and their causes on approximately half of the district population. Data presented in this report is based on routine longitudinal follow-up of this population.

Key findings

Mortality
- In a healthy population fewer deaths are expected at younger ages, however, in the study area more than half of deaths are of individuals aged less than 60 years.
- Crude death rate of 9.5 deaths per 1000 population is high but relatively lower than the country average of 12 deaths per 1000.
• Individuals aged 60+ have the highest mortality rate.
• Mortality rates for children under five rank the second followed by adults (15-59).

**Communicable diseases, maternal, perinatal and nutrition conditions**
• Communicable, maternal, perinatal and nutrition conditions accounted 61% of all deaths in coastal regions.
• Children and adults account for substantial proportion of deaths due to communicable, maternal, perinatal and nutrition conditions.
• Maternal causes take substantial toll among females, attributing about 9% of all deaths.
• Neonatal causes contribute to about 22% of deaths among children younger than five years of age.

**Malaria, TB and HIV**
• Malaria accounts for 32% of deaths in the entire population.
• Among children who died under age five, 52% died due to malaria.
• HIV is the leading cause of death among female adults, account for 24% of deaths.
• TB, HIV and malaria are leading causes of death among male adults, accounting for 20% of all deaths.
• Deaths attributed to malaria among children younger than five years has been consistently decreasing since 2008 but unchanged in the general population.
• Trends in TB and HIV have relatively remained stationary since 2008.

**Burden of disease**
• Malaria, HIV, TB and neonatal causes account for about 50% of the total burden in the general population.
• Children younger than five bare the largest burden of disease per population (500 YLL/1000 person years).
• Malaria accounts for about 50% of the total burden among younger than five.

**Conclusions**
Distributions of risks of death and population burden of disease and injuries presented in this report are essential in planning for treatment and intervention in the district. Key drivers of preventable mortality i.e. malaria, HIV, TB and neonatal causes have available intervention programs in every district in Tanzania. Strengthening of existing district intervention programs is essential in an effort to reduce the burden of preventable causes of mortality.
Individuals aged 60+ have the highest mortality rate. Mortality rates for children under five rank the second followed by adults (15-59).

Communicable diseases, maternal, perinatal and nutrition conditions accounted for 61% of all deaths in coastal regions. Children and adults account for a substantial proportion of deaths due to communicable, maternal, perinatal and nutrition conditions. Maternal causes take a substantial toll among females, attributing about 9% of all deaths. Neonatal causes contribute to about 22% of deaths among children younger than five years of age.

Malaria accounts for 32% of deaths in the entire population. Among children who died under age five, 52% died due to malaria. HIV is the leading cause of death among female adults, accounting for 24% of deaths. TB, HIV and malaria are leading causes of death among male adults, accounting for 20% of all deaths.

Deaths attributed to malaria among children younger than five years has been consistently decreasing since 2008 but unchanged in the general population. Trends in TB and HIV have relatively remained stationary since 2008.

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Purpose
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District health planning
Population distribution of deaths and their causes stratified by age, gender and other risk factors are an important input parameter for priority setting in planning for health care delivery and interventions.

In Tanzania, vital registration and health management information systems are not fully developed to produce reliable information for health planning[1].

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Information on mortality and burden of disease generated from this surveillance can be useful to districts of coastal zones of Coast, Lindi, Mtwarra and Tanga regions and other parts of Tanzania having socio-economic, cultural, and ecologic circumstances broadly similar to those of the rural coast.
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Expected outcome

- Available estimates of causes of death and burden of disease in the district for health planning.
- Reduced burden of disease as a result of implementation of evidence based health care planning.
Demographic surveillance
HDSS is a set of field and computing operations aimed to handle the longitudinal follow-up of well defined entities or primary subjects and all related demographic and health outcomes within a clearly circumscribed geographic area. Unlike a cohort study, a HDSS follows up the entire population of such a geographic area[2]. Rufiji HDSS extend between latitudes 7.47° and 8.03° south and longitudes 38.62° and 39.17° east covering a total are of 1813 square kilometers.

In this report death events and their causes captured in the surveillance area between 2008 and 2011 will be the focus.

Data collection and processing: Cause of death
Cause of death information was obtained through Verbal Autopsy (VA) [3]. The process involves interviewing close relatives of the deceased through a structured questionnaire that details an account of the sequence of events and symptoms leading to death. Structured questionnaires are then reviewed by two independent physicians and the cause of death is assigned using The International Classification of Diseases and related health problems, tenth revision (ICD10) [4]. Both underlying and immediate cause of death are generated, however, in this report underlying causes of death are presented aiming to equip health planners with information relevant for prioritizing health intervention programs.

Cause of death categories
In this report risks and burden of disease are presented on broad age categories of children younger than five years of age, adults and older ages as categorized by Health Metric Network [5]. Three broad categories are examined:

- Communicable diseases, maternal, perinatal and nutritional conditions
- Non-communicable diseases
- Injuries

Burden of disease estimation
Burden of Disease analysis describe in-depth assessment of mortality and loss of health due to diseases, injuries and risk factors. The overall burden of disease in this report is assessed using the Years of Life Lost (YLL), a time-based measure of years of life lost due to premature mortality [6]
Methodology

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Data completeness

HDSS is a population based surveillance study. It is dynamic cohort with in and out migration of individual and household; therefore the population presented in this report is not exact. VA data completeness will be reported by comparing death reported and those with cause of death.

Results

Annual cause of deaths coverage

Table 1: Annual cause of death coverage, 2008-2011

<table>
<thead>
<tr>
<th>Year</th>
<th>HDSS deaths</th>
<th>Final cause of death*</th>
<th>Processing ongoing</th>
<th>Undetermined</th>
<th>Incomplete</th>
<th>VA interview completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>792</td>
<td>451 (67)</td>
<td>227 (28.66)</td>
<td>47 (5.93)</td>
<td>67 (8.46)</td>
<td>565 (71.34)</td>
</tr>
<tr>
<td>2009</td>
<td>750</td>
<td>570 (89)</td>
<td>69 (9.20)</td>
<td>53 (7.07)</td>
<td>58 (7.73)</td>
<td>681 (90.80)</td>
</tr>
<tr>
<td>2010</td>
<td>816</td>
<td>647 (84)</td>
<td>127 (15.56)</td>
<td>36 (4.41)</td>
<td>6 (0.74)</td>
<td>689 (84.44)</td>
</tr>
<tr>
<td>2011</td>
<td>843</td>
<td>670 (85)</td>
<td>120 (14.23)</td>
<td>50 (5.93)</td>
<td>3 (0.36)</td>
<td>723 (85.77)</td>
</tr>
<tr>
<td>Total</td>
<td>3201</td>
<td>2,338 (81)</td>
<td>543 (16.96)</td>
<td>186 (5.81)</td>
<td>134 (4.19)</td>
<td>2,658 (83.04)</td>
</tr>
</tbody>
</table>

* = (Final cause of death)/(HDSS deaths-Undetermined-Incomplete)*100

- Total of 3201 deaths were registered and 81% have final cause of death (Table 1).
- Cause of death assignment is ongoing for 543 (16.9%) deaths.
- Incomplete VA interviews were on 134 (4%) deaths due to absence of eligible person for interview or care taker or out migration and other reasons.
- Physicians could not assign cause to 186 deaths (6%) due to insufficient information documented on VA interviews.
### Cause of death coverage by age group

#### Table 2: Cause of death coverage by age group, 2008-2011

<table>
<thead>
<tr>
<th>Year</th>
<th>HDSS deaths</th>
<th>Final cause of death</th>
<th>Processing ongoing</th>
<th>Undetermined</th>
<th>Incomplete</th>
<th>VA interview completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>844</td>
<td>627 (78)</td>
<td>178 (21.09)</td>
<td>8 (0.95)</td>
<td>31 (3.67)</td>
<td>666 (78.91)</td>
</tr>
<tr>
<td>5-15</td>
<td>159</td>
<td>120 (79)</td>
<td>32 (20.13)</td>
<td>3 (1.89)</td>
<td>4 (2.52)</td>
<td>127 (79.87)</td>
</tr>
<tr>
<td>15-59</td>
<td>781</td>
<td>586 (80)</td>
<td>144 (18.44)</td>
<td>16 (2.05)</td>
<td>35 (4.48)</td>
<td>637 (81.56)</td>
</tr>
<tr>
<td>60+</td>
<td>1,417</td>
<td>1005 (84)</td>
<td>189 (13.34)</td>
<td>159 (11.22)</td>
<td>64 (4.52)</td>
<td>1,228 (86.66)</td>
</tr>
<tr>
<td>Total</td>
<td>3,201</td>
<td>2,338 (81)</td>
<td>543 (16.96)</td>
<td>186 (5.81)</td>
<td>134 (4.19)</td>
<td>2,658 (83.04)</td>
</tr>
</tbody>
</table>

* = (Final cause of death)/(HDSS deaths-Undetermined-Incomplete)*100

- Causes of death coverage is higher for elderly (60+ years) as compared to adult and children.
- Substantially more percent of undetermined cause of deaths (11%) are from old ages (60+).

#### Reporting, interpretation and assumption

The cause of death tabulation in this report is based on 2338 deaths with final cause of death information. The distribution of deaths is considerably different within gender and age categories. Disaggregation by gender and age will be done to account for it. It is assumed that the distributions of cause of death between cases with final cause of death are similar to those without. Since the Rufiji HDSS population covers almost 50% of the district's population, results in this report can be extrapolated to the entire district population. Results in this report are subject to change as new cause of death still on processing are updated on the main database.

#### Age specific mortality rates

In this report crude age specific mortality rates were calculated by dividing number of deaths by total person years of observation. Person year(s) of observation is the years a participant has taken part in our demographic surveillance (excluding periods of absenteeism due to migration).
Figure 1: Number of deaths and age specific mortality rates, 2008-2011

- Overall crude mortality rate is at 10 deaths per 1000 person years.
- Individuals aged 60+ have the highest mortality rate.
- Mortality rates for children younger than five rank second followed by adults (15-59).
- Mortality rates are similar for children, adults and considerably higher for elderly males.
Distribution of age at death

Figure 2: Distribution of age at death in Rufiji, N=3201

- Majority of all 3201 deaths accounted for individual aged below 60.
- Children 0-4 and adult 15-59 account for more than half of all deaths.
- Deaths at ages 5-15 contributed the smallest percentage.
- Substantially high percentage of deaths was contributed by deaths aged 60 and above.

Source: Rufiji HDS3, 2008-2011
Distribution of broad cause of death

Figure 3: Distribution of broad causes of death in Rufiji District, N=2338

- Communicable, maternal, Neonatal and nutrition conditions contributed substantial proportion of death in the DSS area.
- Non-communicable diseases contributed second to first category while injuries had the smallest contribution.
Major cause of death by sex for all ages

Figure 4: Distribution of percent of top 10 cause of death by gender, Males=1168 and Females=1167

- Malaria is a major cause of death for all ages with higher proportion for females as compared to males.
- Hypertension and heart diseases is the second leading cause of deaths.
- HIV is third in the rank where female's deaths are twice those of the males.
- TB causes more deaths among males as compared to females, ranking the 4th cause of death.
- The top 10 diseases above contributed about 70% of all deaths in the district.
Malaria is a major cause of death for all ages with higher proportion for females as compared to males.

Hypertension and heart diseases is the second leading cause of deaths.

HIV is third in the rank where female’s deaths are twice those of the males.

TB causes more deaths among males as compared to females, ranking the 4th cause of death.

The top 10 diseases above contributed about 70% of all deaths in the district.

More than half of deaths of children under-five are due to malaria. Neonatal conditions i.e. birth trauma and asphyxia, Low birth weight, neonatal infections and other neonatal causes account for 22% of all under-five deaths.

Acute Respiratory Infections (mainly lower respiratory tract infections) contributes a substantial proportion of deaths for under-five.

Malaria and neonatal deaths contributes 74% of all deaths for under-five children.
Distribution of major cause of death by sex for adults (15-59)

Figure 6: Distribution of major cause of death for adults (15-59) by gender, Males=273 and Females=313

- Malaria, HIV and TB are major cause of death for adults, the toll is higher for females as compared to males.
- HIV deaths top the rank for females and are twice those of males.
- Maternal deaths account for substantial proportion of death among females.
- CVD deaths are mainly contributed by stroke and hypertensive heart diseases.
- Digestive system diseases account for almost 10% of deaths among males.
- High death toll due to injuries among males.
- The top 9 diseases and injuries above contributed about 85% of all death in the district.
Distribution of major causes of death among older ages (60+)

Figure 7: Distribution of causes of death at older ages, N=1004.

- Malaria is a major cause of death among older ages.
- CVD (includes cardiovascular, heart and stroke), cancer and diabetes account for almost one third of older ages deaths.
- TB, acute respiratory and chronic respiratory infections account for 15% of older ages deaths.
- Diseases of the digestive system are slightly contributing to older ages deaths.
- Diseases of genitourinary system considerably contribute to deaths among older ages.
**Trends of deaths attributable to TB, malaria and HIV**

**Figure 8: Trends in TB, malaria and HIV by age, 2008-2011**

- In a general population malaria deaths have remained almost unchanged.
- Malaria deaths for children under-five have relatively decreased between 2008 and 2011.
- TB deaths for individuals aged above 15 years have remained almost unchanged between 2008 and 2011.
**Burden of disease**

YLL measure the difference between a current situation and an ideal situation where everyone lives up to the age of the standard life expectancy. Standard age and sex specific YLL table has been referenced elsewhere[7]. Total YLL for specific age and sex was calculated by the product of YLL by number of deaths.

**Figure 9: YLL and age specific YLL per 1000 person years, 2008-2011**

- Children younger than 5 years have the highest years of life lost per 1000 population.
- Approximately 182 years of life lost per 1000 person years are due to premature deaths.
Burden of disease among children under five years of age

Table 3: YLL, percent of YLL and YLL per 1000 by cause for children under five years of age

<table>
<thead>
<tr>
<th>Disease</th>
<th>YLL</th>
<th>% of Total YLL</th>
<th>YLL/1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria</td>
<td>12058.9</td>
<td>53.6</td>
<td>224.3</td>
</tr>
<tr>
<td>Low birth weight</td>
<td>1951.0</td>
<td>8.7</td>
<td>36.3</td>
</tr>
<tr>
<td>Birth trauma</td>
<td>1687.2</td>
<td>7.5</td>
<td>31.4</td>
</tr>
<tr>
<td>Lower respiratory tract infections</td>
<td>1399.1</td>
<td>6.2</td>
<td>26.0</td>
</tr>
<tr>
<td>Neonatal infections</td>
<td>562.1</td>
<td>2.5</td>
<td>10.5</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>539.3</td>
<td>2.4</td>
<td>10.0</td>
</tr>
<tr>
<td>Other neonatal causes</td>
<td>496.8</td>
<td>2.2</td>
<td>9.2</td>
</tr>
<tr>
<td>Protein-energy deficiency</td>
<td>473.0</td>
<td>2.1</td>
<td>8.8</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>402.9</td>
<td>1.8</td>
<td>7.5</td>
</tr>
<tr>
<td>Other non deficiency anemia</td>
<td>270.2</td>
<td>1.2</td>
<td>5.0</td>
</tr>
</tbody>
</table>

- Malaria, neonatal conditions, respiratory infections and HIV account for more than 80% of burden of diseases among children under five.
- Malaria contributes more than half of total years of life lost among children under-five years.
- Malaria account for the largest proportion of the burden.
- Neonatal causes and conditions contributes approximately 20% of years of life lost among under-fives.

Burden of disease among adults (15-59)

Table 4: YLL, percent of YLL and YLL per 1000 by cause for adults (15-59)

<table>
<thead>
<tr>
<th>Disease</th>
<th>YLL</th>
<th>% of Total YLL</th>
<th>YLL/1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV/AIDS</td>
<td>3031.9</td>
<td>19.9</td>
<td>20.0</td>
</tr>
<tr>
<td>Malaria</td>
<td>2670.7</td>
<td>17.5</td>
<td>17.6</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>1633.0</td>
<td>10.7</td>
<td>10.8</td>
</tr>
<tr>
<td>Hypertensive and heart disease</td>
<td>689.2</td>
<td>4.5</td>
<td>4.5</td>
</tr>
<tr>
<td>Other digestive system diseases</td>
<td>577.9</td>
<td>3.8</td>
<td>3.8</td>
</tr>
<tr>
<td>Road traffic accident</td>
<td>476.0</td>
<td>3.1</td>
<td>3.1</td>
</tr>
<tr>
<td>Unspecified uterine cancer</td>
<td>436.9</td>
<td>2.9</td>
<td>2.9</td>
</tr>
<tr>
<td>Epilepsy disease</td>
<td>407.1</td>
<td>2.7</td>
<td>2.7</td>
</tr>
<tr>
<td>Ill-defined cardiovascular conditions</td>
<td>400.6</td>
<td>2.6</td>
<td>2.6</td>
</tr>
<tr>
<td>Hypertension in pregnancy</td>
<td>359.0</td>
<td>2.4</td>
<td>2.4</td>
</tr>
</tbody>
</table>
Burden of disease among children under five years of age

Table 3: YLL, percent of YLL and YLL per 1000 by cause for children under five years of age

<table>
<thead>
<tr>
<th>Disease</th>
<th>YLL</th>
<th>% of Total YLL</th>
<th>YLL/1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria</td>
<td>1205</td>
<td>53.6</td>
<td>224.3</td>
</tr>
<tr>
<td>Low birth weight</td>
<td>195</td>
<td>8.7</td>
<td>36.3</td>
</tr>
<tr>
<td>Birth trauma</td>
<td>168</td>
<td>7.5</td>
<td>31.4</td>
</tr>
<tr>
<td>Lower respiratory tract infections</td>
<td>139</td>
<td>6.2</td>
<td>26.0</td>
</tr>
<tr>
<td>Neonatal infections</td>
<td>562</td>
<td>2.5</td>
<td>10.5</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>539</td>
<td>2.4</td>
<td>10.0</td>
</tr>
<tr>
<td>Other neonatal causes</td>
<td>497</td>
<td>2.2</td>
<td>9.2</td>
</tr>
<tr>
<td>Protein-energy deficiency</td>
<td>473</td>
<td>2.1</td>
<td>8.8</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>403</td>
<td>1.8</td>
<td>7.5</td>
</tr>
<tr>
<td>Other non deficiency anaemia</td>
<td>270</td>
<td>1.2</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Malaria, neonatal conditions, respiratory infections and HIV account for more than 80% of burden of diseases among children under five.

Malaria contributes more than half of total years of life lost among children under-five years.

Malaria account for the largest proportion of the burden.

Neonatal causes and conditions contributes approximately 20% of years of life lost among under-fives.

Burden of disease among adults (15-59)

Table 4: YLL, percent of YLL and YLL per 1000 by cause for adults (15-59)

<table>
<thead>
<tr>
<th>Disease</th>
<th>YLL</th>
<th>% of Total YLL</th>
<th>YLL/1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV/AIDS</td>
<td>303</td>
<td>19.9</td>
<td>20.0</td>
</tr>
<tr>
<td>Malaria</td>
<td>267</td>
<td>17.5</td>
<td>17.6</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>163</td>
<td>10.7</td>
<td>10.8</td>
</tr>
<tr>
<td>Hypertensive and heart disease</td>
<td>69</td>
<td>4.5</td>
<td>4.5</td>
</tr>
<tr>
<td>Other digestive system diseases</td>
<td>58</td>
<td>3.8</td>
<td>3.8</td>
</tr>
<tr>
<td>Road traffic accident</td>
<td>476</td>
<td>3.1</td>
<td>3.1</td>
</tr>
<tr>
<td>Unspecified uterine cancer</td>
<td>437</td>
<td>2.9</td>
<td>2.9</td>
</tr>
<tr>
<td>Epilepsy disease</td>
<td>407</td>
<td>2.7</td>
<td>2.7</td>
</tr>
<tr>
<td>Ill-defined cardiovascular conditions</td>
<td>401</td>
<td>2.6</td>
<td>2.6</td>
</tr>
<tr>
<td>Hypertension in pregnancy</td>
<td>359</td>
<td>2.4</td>
<td>2.4</td>
</tr>
</tbody>
</table>

HIV, Malaria and TB top the rank of burden of disease among adults age 15 to 59 years.

Malaria accounts for the largest proportion of the burden.

Hypertension and heart diseases substantially contribute to the burden of disease among adults.

The above diseases and conditions account for 70% of total burden of disease for adults.

Burden of disease among old age (60+)

Table 5: YLL, percent of YLL and YLL per 1000 by cause for older ages (60+)

<table>
<thead>
<tr>
<th>Disease</th>
<th>YLL</th>
<th>% of Total YLL</th>
<th>YLL/1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria</td>
<td>2506</td>
<td>51.4</td>
<td>77.3</td>
</tr>
<tr>
<td>Road traffic accident</td>
<td>294</td>
<td>6.0</td>
<td>9.1</td>
</tr>
<tr>
<td>Other non deficiency anaemia</td>
<td>261</td>
<td>5.4</td>
<td>8.0</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>183</td>
<td>3.8</td>
<td>5.7</td>
</tr>
<tr>
<td>Other genitourinary diseases</td>
<td>150</td>
<td>3.1</td>
<td>4.6</td>
</tr>
<tr>
<td>Meningitis</td>
<td>148</td>
<td>3.0</td>
<td>4.6</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>147</td>
<td>3.0</td>
<td>4.5</td>
</tr>
<tr>
<td>Unspecified uterine cancer</td>
<td>113</td>
<td>2.3</td>
<td>3.5</td>
</tr>
<tr>
<td>Epilepsy disease</td>
<td>112</td>
<td>2.3</td>
<td>3.4</td>
</tr>
<tr>
<td>Other nervous system and sense organ disorder</td>
<td>111</td>
<td>2.3</td>
<td>3.4</td>
</tr>
</tbody>
</table>

Malaria accounts for half of the burden of disease among older ages.

Traffic accidents, TB, nutritional deficiencies, meningitis and HIV/AIDS each account for at least 3% of the total burden of disease.

The above top 10 diseases and injuries account for at least 80% of the total burden of disease.
Burden of disease for all ages

Table 6: YLL, percent of YLL and YLL per 1000 by cause for all ages (15-59)

<table>
<thead>
<tr>
<th>Disease</th>
<th>Male</th>
<th>Female</th>
<th>Both</th>
<th>Male % of Total YLL</th>
<th>Female % of Total YLL</th>
<th>Both % of Total YLL</th>
<th>YLL/1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria</td>
<td>8755.6</td>
<td>37.5</td>
<td>9729.6</td>
<td>39.6</td>
<td>18485.2</td>
<td>38.5</td>
<td>55.0</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>1309.9</td>
<td>5.6</td>
<td>2580.6</td>
<td>10.5</td>
<td>3890.5</td>
<td>8.1</td>
<td>11.6</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>1303.7</td>
<td>5.6</td>
<td>928.8</td>
<td>3.8</td>
<td>2232.5</td>
<td>4.7</td>
<td>6.6</td>
</tr>
<tr>
<td>Low birth weight</td>
<td>924.3</td>
<td>4.0</td>
<td>1026.7</td>
<td>4.2</td>
<td>1951.0</td>
<td>4.1</td>
<td>5.8</td>
</tr>
<tr>
<td>Lower respiratory tract infections</td>
<td>968.5</td>
<td>4.1</td>
<td>974.4</td>
<td>4.0</td>
<td>1942.9</td>
<td>4.1</td>
<td>5.8</td>
</tr>
<tr>
<td>Birth trauma</td>
<td>859.2</td>
<td>3.7</td>
<td>829.5</td>
<td>3.4</td>
<td>1688.7</td>
<td>3.5</td>
<td>5.0</td>
</tr>
<tr>
<td>Hypertensive heart disease</td>
<td>597.8</td>
<td>2.6</td>
<td>881.5</td>
<td>3.6</td>
<td>1479.3</td>
<td>3.1</td>
<td>4.4</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>583.8</td>
<td>2.5</td>
<td>386.5</td>
<td>1.6</td>
<td>970.3</td>
<td>2.0</td>
<td>2.9</td>
</tr>
<tr>
<td>Road traffic accident</td>
<td>674.5</td>
<td>2.9</td>
<td>272.4</td>
<td>1.1</td>
<td>946.9</td>
<td>2.0</td>
<td>2.8</td>
</tr>
<tr>
<td>Other non deficiency anemia</td>
<td>356.8</td>
<td>1.5</td>
<td>519.0</td>
<td>2.1</td>
<td>875.8</td>
<td>1.8</td>
<td>2.6</td>
</tr>
</tbody>
</table>

- Malaria accounts for the largest proportion of the burden for all ages.
- TB and HIV rank second and third causes of mortality respectively.
- Neonatal causes and conditions substantially contribute to premature loss of life.
- Top 10 diseases and conditions above account for 70% of the total burden.

Discussion

The analyses in this report produced summary findings of burden of disease and injuries statistics for coastal zone regions of Coast, Lindi, Mtwara, Tanga and other parts of Tanzania having similar socio-economic, cultural, and ecologic circumstances broadly similar to Rufiji HDSS area where empirical data were derived.

Empirical data on demographics and cause of deaths were derived in the period 2008-2011 and covers 6 main areas: (i) Estimating age specific mortality rates; (ii) Describing broad cause of death; (iii) Estimating distribution of attributable causes of death and injuries by broad age group; (iv) Estimating recent annual trends in malaria, TB and HIV; (v) Estimating age and cause specific attributable and population burden of disease and injuries. It is important to recognize that causes of death provided in this report are underlying causes (disease
initiating series of traits leading to death). An empirical case includes malaria and TB deaths tabulated as underlying causes while anemia and HIV were the immediate causes of death respectively. Malaria deaths reported are based on clinical diagnosis therefore there is higher likelihood of overestimation of the attributable risk of death due to malaria as some of acute febrile illnesses conditions are likely to be classified as malaria.

### Age specific mortality rates
- In a healthy population fewer deaths are expected at younger ages, however in the study area more than half of deaths are of individual aged less than 60 years.
- Crude death rate of 9.5 deaths per 1000 population is high but relatively lower than the country average of 12 deaths per 1000.
- Age specific crude death rates are relatively higher at younger ages for males and vise verse at older ages possibly due to the impact of HIV.

### Broad cause of death
- As in most developing countries communicable, maternal, perinatal and nutrition conditions accounted for most of deaths in coastal regions.
- Countries that have made significant progress in addressing communicable, maternal, perinatal and nutritional related deaths have significantly made a notable transition to deaths at older ages due to non-communicable diseases.

### Age specific attributable cause of deaths
- Despite of available treatment and interventions, malaria is still a key driver of mortality among children younger than five.
- Neonatal conditions that can be addressed immediately after delivery or through professional delivery account for substantial proportion of deaths among children younger than five years.
- Malaria, TB and HIV are the leading causes of deaths among females.
- Females are more affected by malaria and HIV as compared to males.
- Maternal attributable causes still considerably contribute to deaths among females.
- Non-communicable causes dominated among older ages.

### Trends in malaria, TB and HIV
- There have been decreasing trends in malaria attributable deaths for children younger than five years.
- Constant trend in malaria deaths for all ages.
- Deaths attributable to TB and HIV have shown fluctuating trends among adults.
Burden of disease and injuries

- Malaria, HIV, TB and neonatal causes account for a substantial proportion of burden in the general population.
- There is a slight difference in the distribution of the total burden of disease among males and females on malaria, TB and HIV.
- The burden of malaria, HIV and TB deaths is higher among females as compared to males adults despite ARV scale up in the district.
- Children younger than five bear the largest burden of disease per population.
- Malaria account for half of the total burden of disease and injuries among younger than five.
- Malaria, HIV and TB are the leading cause of the burden among adults.
- Malaria accounts for a substantial proportion of the population burden among old ages.

Conclusion

Distributions of risks of death and population burden of disease and injuries presented in this report are essential in planning for health intervention in the district. Key drivers of preventable mortality i.e. malaria, HIV, TB and neonatal causes have available intervention programs in every district in Tanzania. Strengthening of existing district intervention programs is essential in reducing the burden of preventable causes of mortality.
Burden of disease and injuries

Malaria, HIV, TB and neonatal causes account for a substantial proportion of burden in the general population. There is a slight difference in the distribution of the total burden of disease among males and females on malaria, TB and HIV. The burden of malaria, HIV and TB deaths is higher among females as compared to males adults despite ARV scale up in the district. Children younger than five bear the largest burden of disease per population. Malaria account for half of the total burden of disease and injuries among younger than five. Malaria, HIV and TB are the leading cause of the burden among adults. Malaria accounts for a substantial proportion of the population burden among old ages.

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Reference


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Summary findings of analysis of cause of death data

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