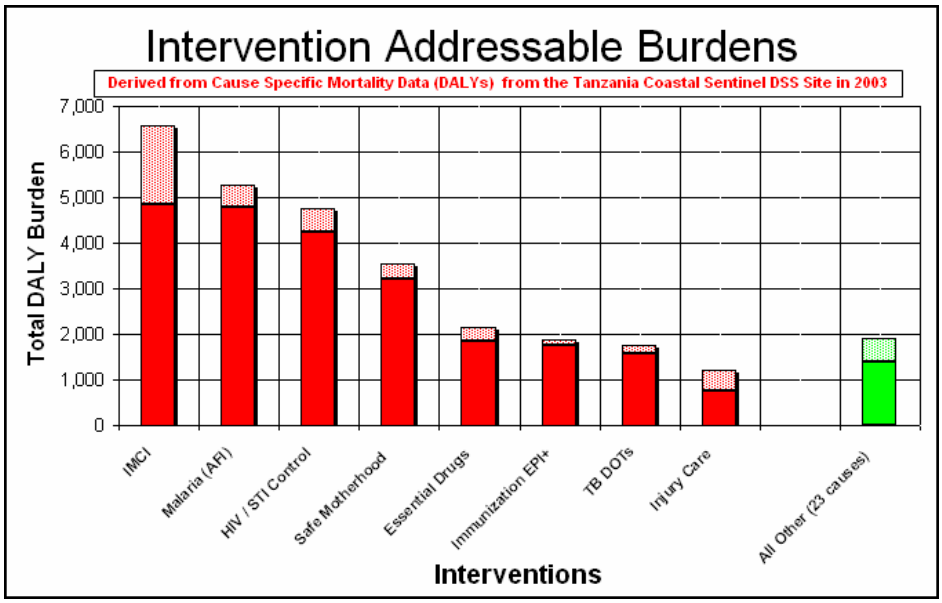
Tanzania

Ministry of Health

DISTRICT HEALTH INTERVENTIONS PROFILE 2004

An Illustrated Guide to Selected Health and Demographic indicators



A Source of Information for Council Health Management Teams for the 2004-2005 District Health Year and 2005 Planning Cycle

- For Tanzanian Rural Coastal Districts -
Lindi, Mtwara, Pwani and Tanga Regions

Based on the Coastal Sentinel Demographic Surveillance System

Data Source: Coastal Sentinel Demographic Surveillance System data from 2003
Tanzania Ministry of Health, HMIS National Sentinel Surveillance System (NSS)
Tool Version: TEHIP Burden of Disease Information Tool, Version 1.6
Document Version: Tanzania Coastal District Health Intervention Profile 2004: Version 1.6

DISTRICT HEALTH INTERVENTIONS PROFILE 2004
RURAL COASTAL DISTRICTS

Rufiji DSS Sentinel District Information for Districts of Lindi, Mtwara, Pwani and Tanga Regions

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DISTRICT HEALTH INTERVENTIONS PROFILE 2004

Coastal DSS Sentinel District Information for Districts of Lindi, Mtwara, Pwani and Tanga Regions

Part 1: Introduction

The purpose of this document is to simplify, package, and communicate complex information on vital statistics and the local burden of disease in a practical, accessible format for district health planning. It is intended for use by Council Health Management Teams who serve several million people in rural districts of the coastal zone of Coast, Lindi, Mtwara and Tanga Regions and other parts of Tanzania having socio-economic, cultural, and ecologic circumstances broadly similar to those of Rufiji District. This information should be considered as part of the situation analysis for the annual District Health Planning cycle. All information is provided in a graphical format with short explanatory captions and minimum text to provide "pictures" of the current demography and disease burden.

The source of this information is the Tanzania Ministry of Health's National Sentinel Surveillance System (NSS). The specific data in this profile comes from the TEHIP Coastal Sentinel Demographic Surveillance System located in Rufiji District for the year 2003. This sentinel profile is updated annually. In the year 2003, the Rufiji Demographic Surveillance System monitored a population of 88,000 people; recording 79,232 person-years lived in about 18,600 households. This sample is very much larger than the DHS and other national household surveys. In the year 2003, the system documented 3,109 births and 831 deaths, including the causes, rates and trends of these deaths.

Health reforms in Tanzania expect Districts to go beyond just managing diseases, to managing health systems from a perspective of health equity. It is difficult for health systems to target the poor accurately. However in all societies, the poor carry the heaviest burden of disease and it is possible to target major components of the Burden of Disease (BOD), thus increasing equity in resource allocation with more emphasis on the poor. For districts, this means a greater focus on cost-effective interventions that address the largest shares of the burden of disease. In Africa, 80% of the BOD[1] comes from premature mortality. The causes of this mortality also cause most of the disability that makes up the remaining 20%. Therefore we can use cause-specific mortality burden as a guide to setting priorities. Since most mortality occurs at home or outside of health facilities, we cannot rely on conventional, health facility-based, Health Management Information Systems' attendance data as the source of information on the burden experienced by communities and households. Instead we can use household derived demographic surveillance data from the National Sentinel Surveillance System for understanding the real burden and its trends in various parts of the country.

In **Part 2** of this document we convert current remaining disease-specific mortality into *intervention addressable* shares of the total burden of disease and present this in a pictorial format as follows:

Distribution of the total household burden of disease by:

- Broad causes (e.g. Communicable; Non-Communicable; and External causes);
- Main causes (e.g. Communicable; Perinatal, Maternal, Nutritional; etc.)
- Broad groups (e.g. under-fives, five and over, and women of child-bearing age);
- Cost-effective interventions available to CHMTs and rural district health services;
- Individual conditions addressed by cost-effective intervention strategies.

The above information is essential for identifying the most important health intervention priorities (as opposed to disease priorities) and in allocating appropriate and proportionate resources for the support of selected interventions at district level.

In **Part 3** we provide additional graphical information for planning the health system such as:

Distribution of births and deaths by:

- Month and season;
- Place of birth or death;
- Health seeking behaviour in the condition leading to death.

In **Part 4** we provide a demographic breakdown of the sentinel population structure by age, sex, current fertility and age specific mortality rates. These are applied to the current district populations to predict the numbers of births, infants, under-fives, pregnancies, and deaths to be expected at district level in the next planning year.

In **Part 5** we provide a one-page summary and conclusions, as well as contacts for further information on the NSS and the Rufiji (Coastal) DSS.

Part 2: Intervention Addressable Burden of Disease Graphics

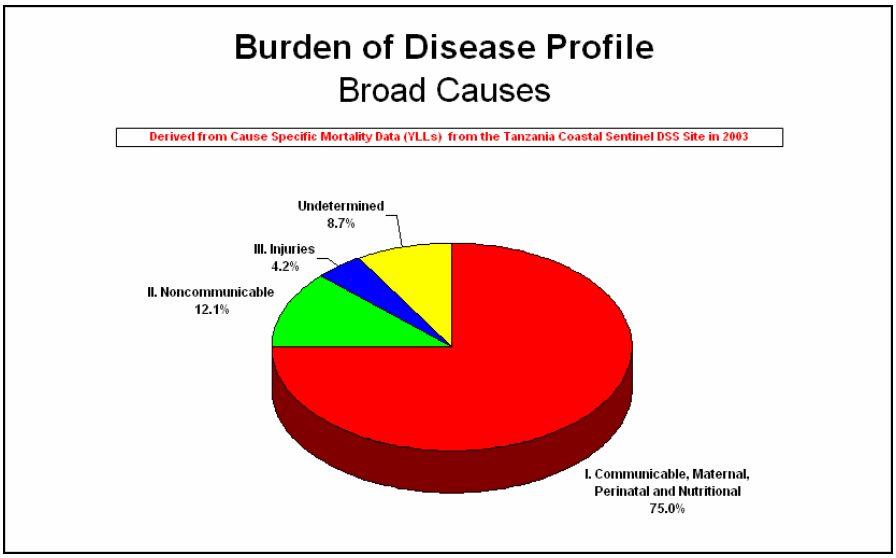


Figure 1. Broad Causes of the Burden of Disease in 2003
In Figure 1 above, the total burden of disease in the Coastal Sentinel is divided into three broad groups of causes. Group I (red) contains all communicable, maternal, perinatal and nutritional causes. In the Coastal Sentinel district, these account for 75% of the total burden. Group II (green) represents the non-communicable diseases and accounts for 12% of the total burden. Group III (blue) is all external causes such as injuries and contains about 4% of the burden. The remaining 9% of the burden is undetermined by available methods (yellow). This overall pattern indicates that the health transition towards non-communicable and life style diseases is not yet very advanced in coastal regions of Tanzania and that there is a large unfinished agenda of preventable conditions to address. The Coastal pattern is similar to the rest of Africa, except that the proportion due to injuries is much less. This is due to the current heavy burden of injury inflicted by war and civil conflicts in several African countries, which does not occur in Tanzania.

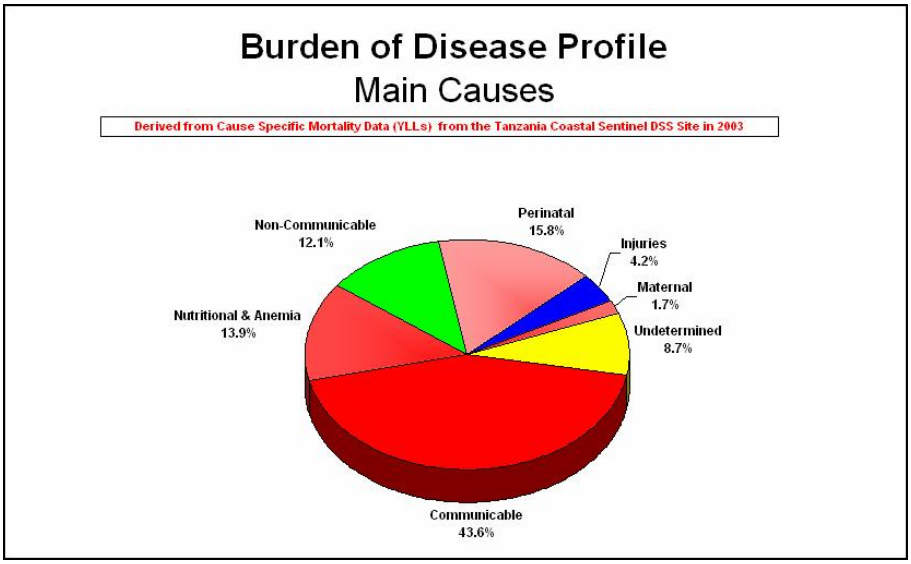


Figure 2. More Detailed Main Causes
In figure 2 (above), Group I (red) is further sub-divided into its components to show the communicable, perinatal, maternal and nutritional shares for the Coastal Sentinel district. Communicable diseases dominate the pattern and contribute over 43% of the total burden. Malnutrition as a direct cause of mortality is relatively uncommon in Tanzania, but it should be appreciated that malnutrition is a common underlying cause of other mortality and deserves more attention than this picture might suggest. The relatively large share (16%) of the burden of disease due to perinatal mortality is a cause of concern and emphasizes the importance of the **Safe Motherhood Initiative** and **STI Control.**

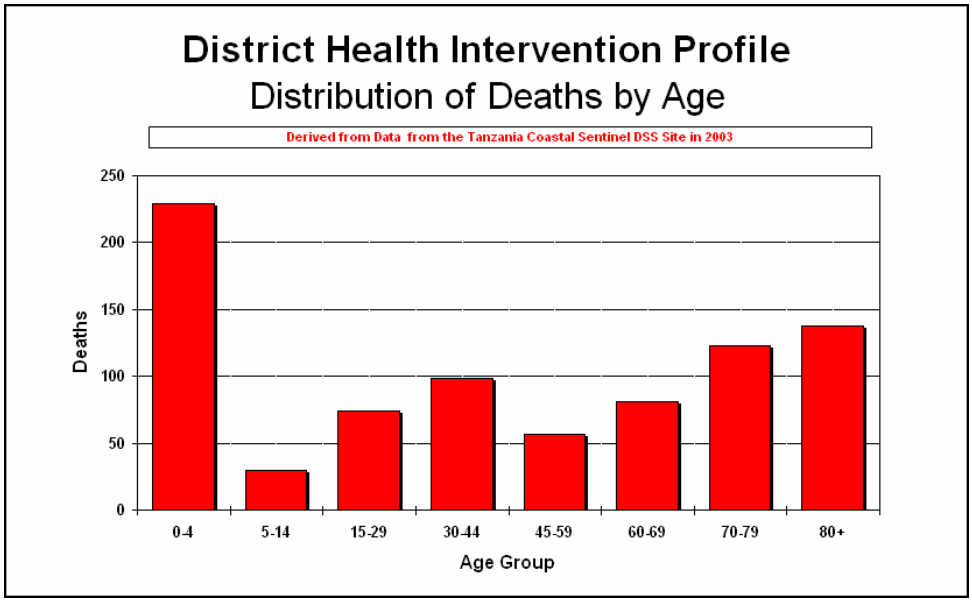


Figure 3. Mortality by Age Group
Figure 3 above shows that much of the total population's mortality is still experienced during the first five years of life. This is due to preventable child illnesses. A second preventable peak occurs in young adults and is largely due to the effects of HIV/AIDS and TB.

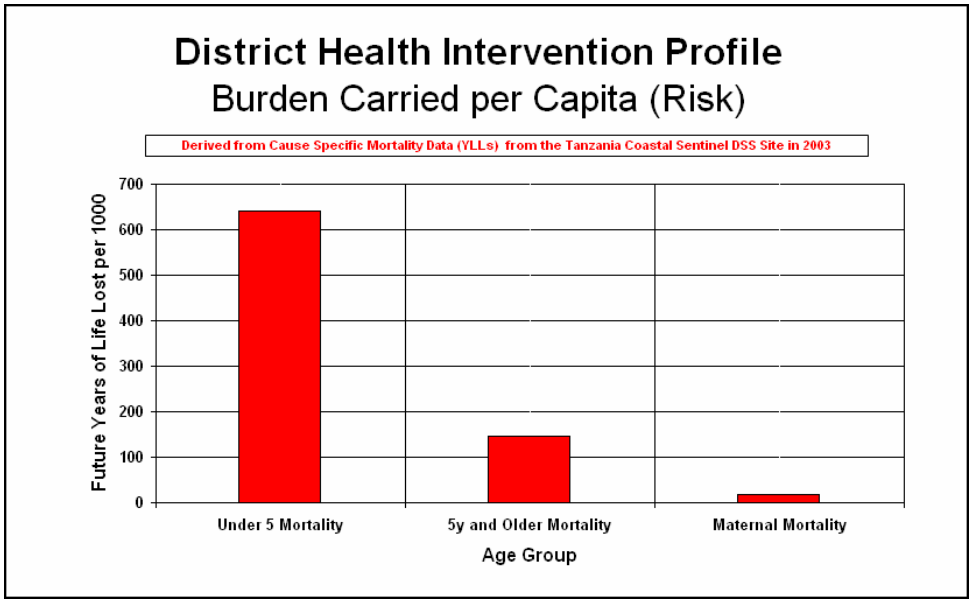


Figure 4. Per Capita Mortality Burden by Age Group
Both Figures 3 and 4 illustrate the disproportionately high risk of disease burden carried by children. Figure 4 shows the relative burden of disease (risk) on a *per capita* basis for each of the three categories. This graph adjusts for the fact that age categories are unequal in size. The under-fives represent a 5 year age class and contain only 17% of the population, yet carry about 48% of the mortality (YLL) burden. The 5-year and older age group spans over 80 years and includes 83% of the population but carries only 52% of the burden. Included in this group is the maternal age group that spans 35 years and includes 21% of the total population and suffers a loss of 1.7% of total life years due to maternal mortality. The *per capita* shares represent the relative risk of burden of disease for those in each age category. Under-five mortality clearly demands high priority. (Maternal mortality is is also part of the 5-year and older mortality).

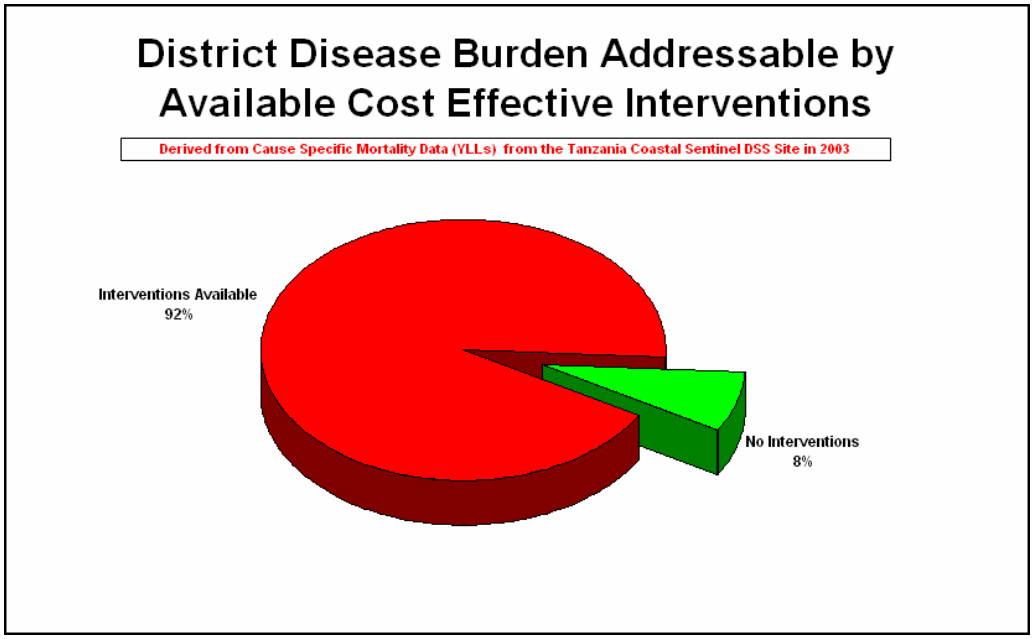


Figure 5. District Disease Burden Addressable by Available Cost-Effective Interventions
Although it is not possible to prevent all premature mortality, the above graph shows the good news that 92% of the year 2003 remaining disease burden can be addressed by cost-effective interventions available through Council Health Plans. As new cost-effective interventions become available for the non-addressed 8% of the burden, these can eventually be considered for inclusion in the National Package of Essential Health Interventions for rural districts.

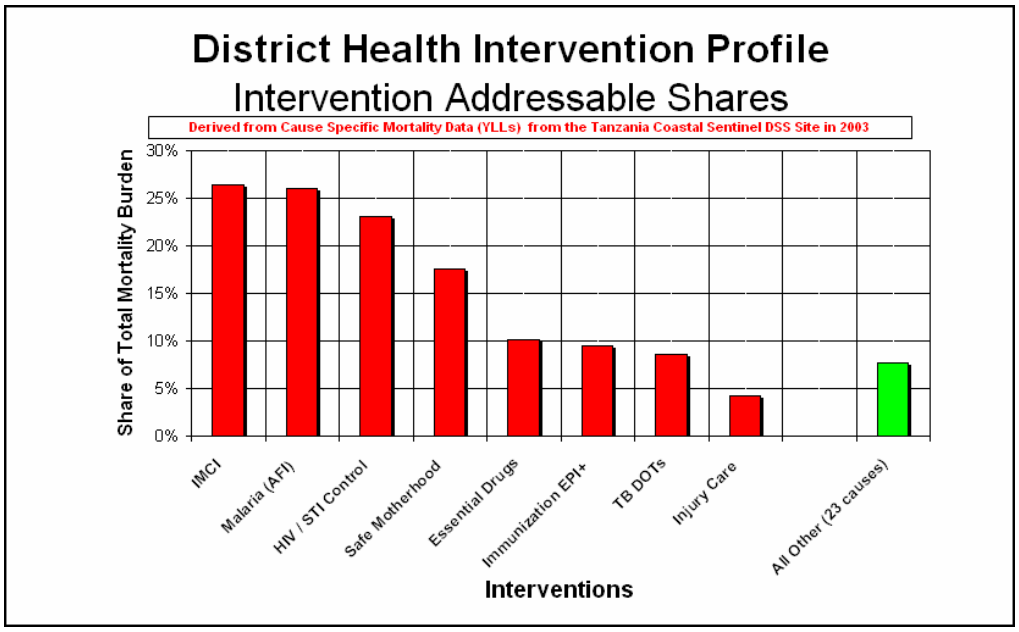


Figure 6. Intervention Addressable Shares of the Burden of Disease
The above graph shows how much of the total burden of disease is addressed by each individual cost-effective essential health intervention strategy currently available at District level. This core package includes all interventions that address at least 2% of the burden of disease and which are considered cost-effective. Together these represent a minimum package for such districts and include: **Integrated Management of Childhood Illnesses (IMCI); Case management and prevention for acute febrile illnesses (AFI) including malaria; Insecticide Treated Nets (ITNs) for prevention of malaria; Intermittent Presumptive Therapy (IPT) for Malaria in Pregnancy, STD Syndromic Management; Safe Motherhood Initiative (SMI); EDP; EPI; TB DOTS; and Injury Care**. Since some diseases are addressed by more than one intervention package, these shares add to more than 100%. The category labeled *All Other* (8%) is all remaining disease burden not yet addressable by any of the listed cost-effective essential health interventions (see below).

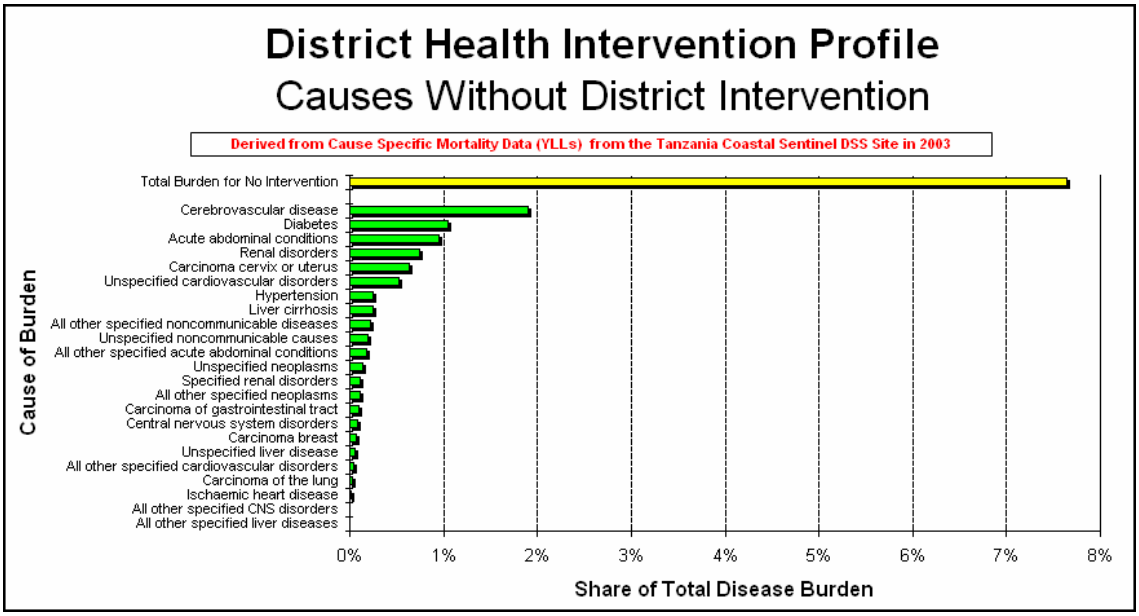


Figure 7. Causes without Cost-Effective District Intervention
The causes of death (23) that make up the 8% share that is currently not yet addressable by cost-effective essential health interventions at rural level are shown in the above graph. Most of these causes individually constitute less than 0.5% of the total burden of disease in the population and will be difficult to address cost-effectively without high opportunity costs.

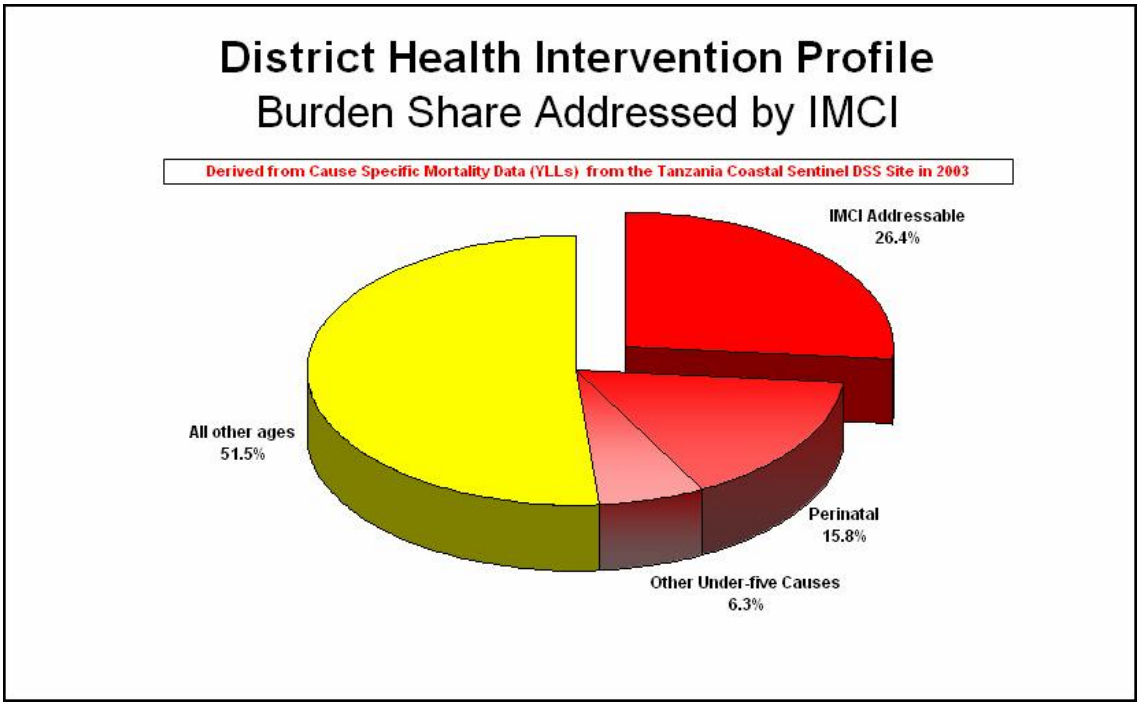


Figure 8. Disease Burden Share Addressed by Childhood Interventions
Children under the age of five carry the highest per capita share of the total burden. The above graph shows that if **Integrated Management of Childhood Illness (IMCI)**, an integrated, cost-effective essential health strategy targeted to under-fives, was the only intervention offered, it would address over one quarter of the total population burden of disease. No other single intervention addresses such a large portion of the burden of disease, thus this package merits intensive support to reach high levels of coverage. The total share of the burden addressable by IMCI has decreased from 41.3% in 1999 to 26.4% in 2003, possibly as a response to the wide access to IMCI that was achieved since 1999 in Rufiji District. Similar gains might be expected in other districts achieving similar coverage through use of Council Health Basket Funding as done in Rufiji.

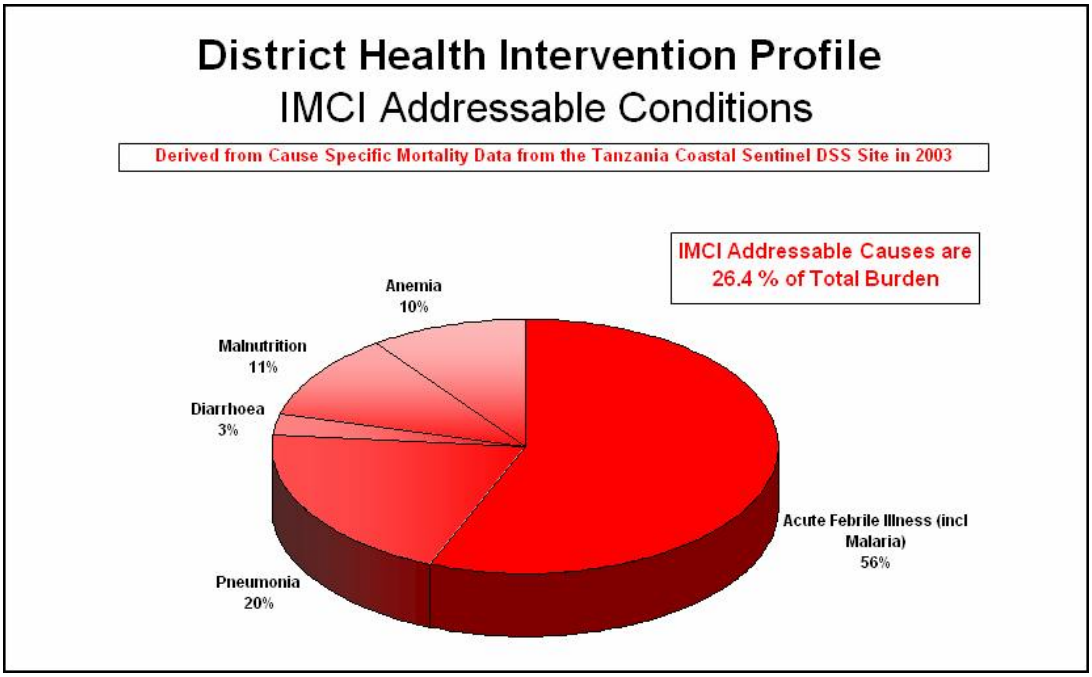


Figure 9. Integrated Management of Childhood Illness (IMCI) Addressable Conditions
The **IMCI** strategy addresses the largest single share of the District disease burden. The above graph illustrates the relative contribution of the individual component conditions addressed by IMCI. Acute febrile illness including malaria constitutes about 56% of the under-five burden and emphasizing the importance of providing efficacious preventive and curative interventions for malaria. The transition from chloroquine to SP has improved the effectiveness of IMCI.

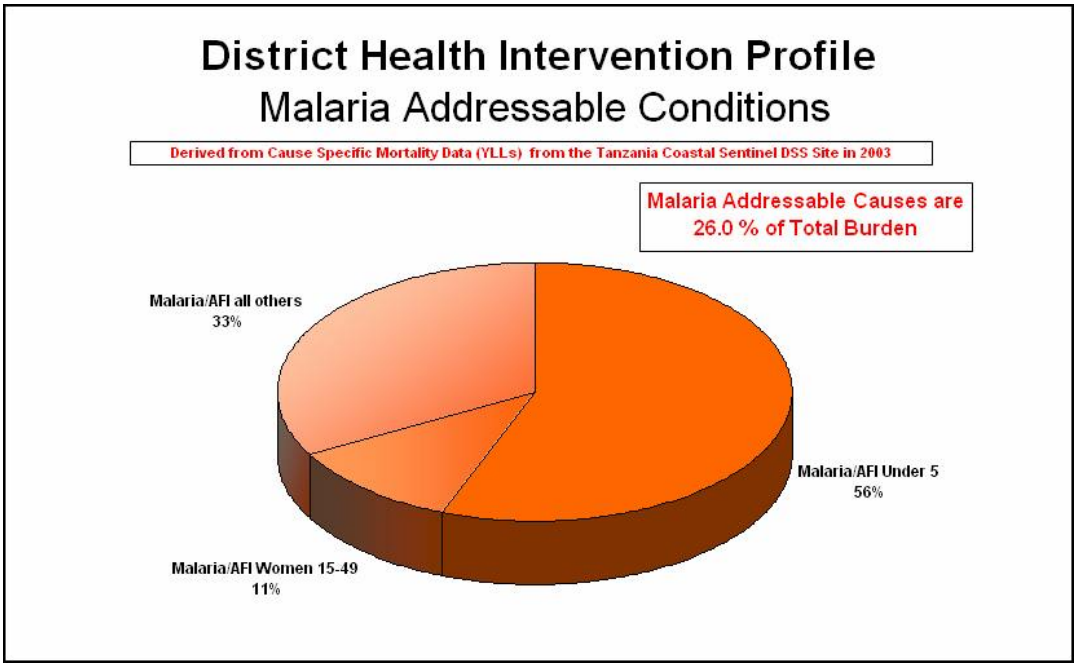


Figure 10. Malaria and Acute Febrile Illness Addressable Conditions
26% of the total burden of disease of the population is driven by acute febrile illness, predominantly malaria (down from 37% in 1999). Of this, about 56% is suffered by children under-five (also counted in IMCI). The other important risk group is pregnant women. Women 15-49 are 21% of the population and carry about 11% of the malaria burden. This risk increases during pregnancy. This illustrates the importance of prompt and effective **Malaria Case Management with SP** according to the new National Guidelines, and preventive interventions such as **Insecticide Treated Nets (ITNs)**, especially for mothers and young children, and **Intermittent Presumptive Treatment (IPT)** during pregnancy.

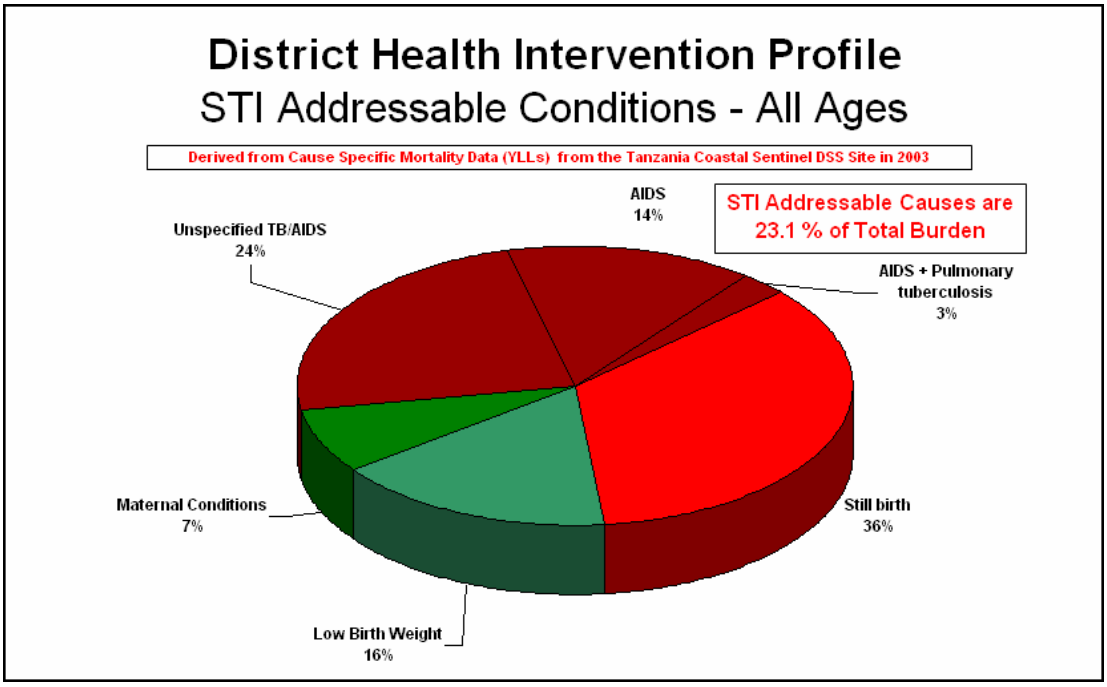


Figure 11. Sexually Transmitted Infection (STI) Addressable Conditions
Sexually Transmitted Infections (STIs), including HIV/AIDS, constitute about 23% of the total disease burden in 2003 (up from 14% in 1999). They are the third largest addressable component of the burden of disease. HIV/AIDS causes about half of the mortality due to STIs, either directly or through increasing the risk of TB. Other major contributors are stillbirths (mainly associated with syphilis), low birth weight, and maternal conditions (possibly associated with chlamydia and gonorrhoea). STIs can be partially addressed by carefully selected **Reproductive Health** interventions such as **STD Syndromic Management, RPR Screening in Pregnancy, Family Planning, Condom Promotion, Strengthening Blood Transfusion Safety, School Health and Youth Interventions, SMI,** etc**.**

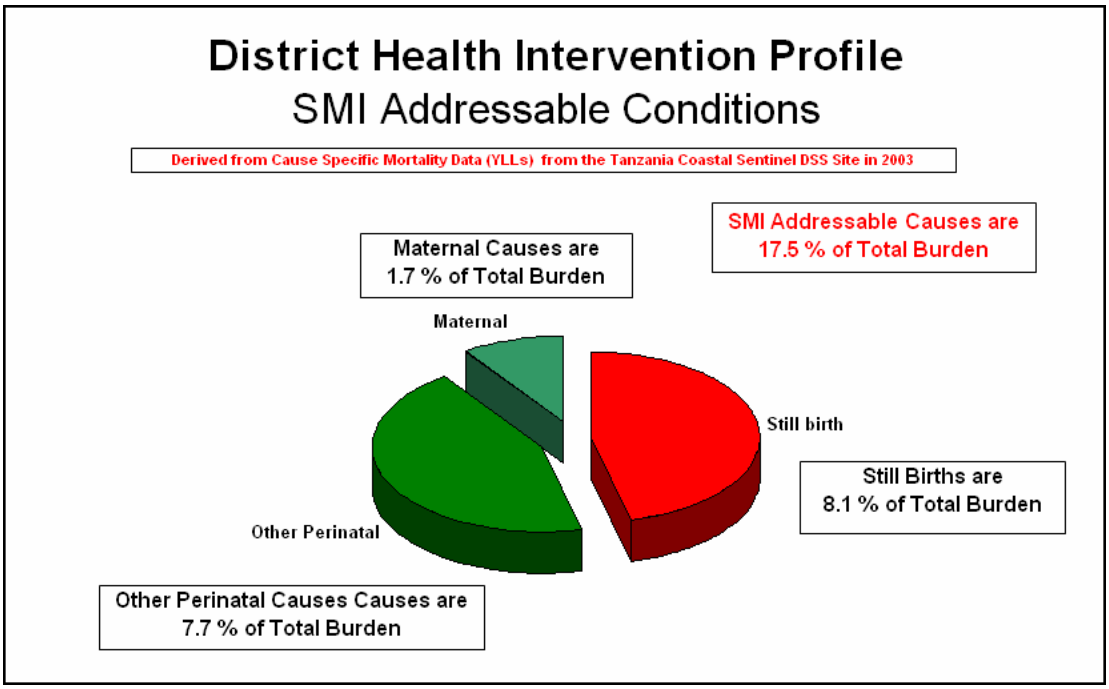


Figure 12. Safe Motherhood (SMI) Addressable Conditions
The above graph illustrates the portions of the burden of disease addressed by the **Safe Motherhood Initiative** that collectively addresses the fourth largest portion of the burden of disease (18%). This is composed of maternal mortality at 1.7%, stillbirth, at 8.1%, and other perinatal causes at 7.7% of total burden respectively. The next two graphs show the actual component causes within the maternal and perinatal burdens separately.

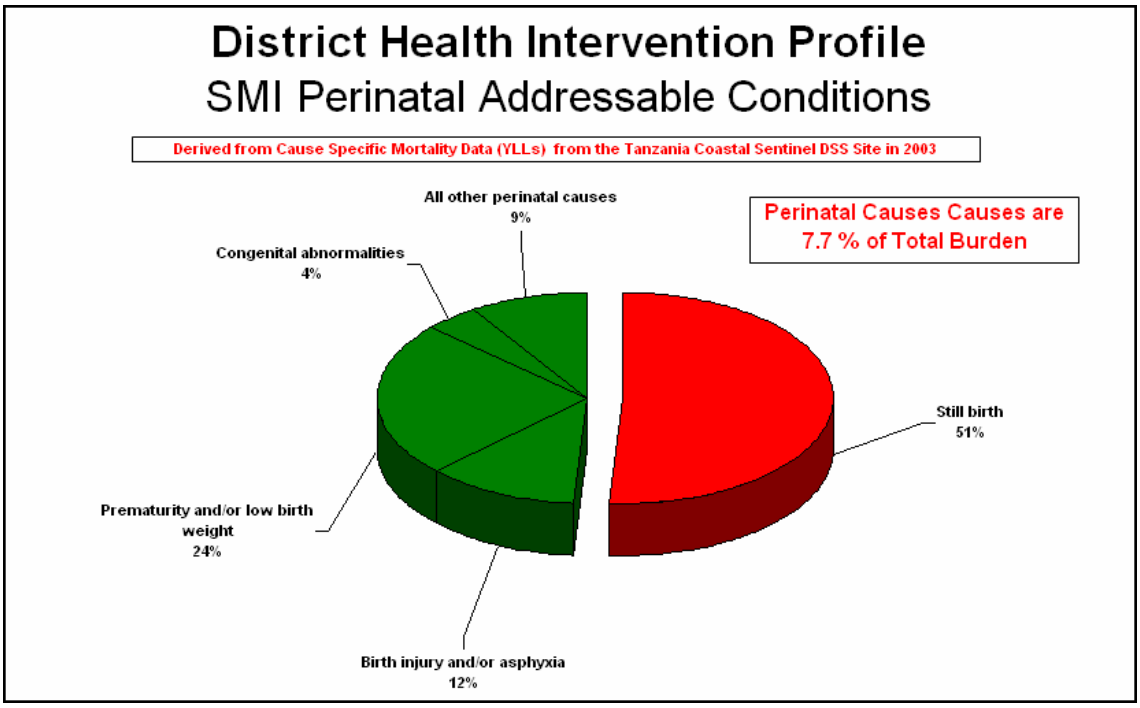


Figure 13. Safe Motherhood (SMI) Perinatal Addressable Conditions
The above graph shows perinatal mortality within SMI. Stillbirths are the largest share and are increasing, followed by prematurity or low birth weight, birth injury or asphyxia, and congenital abnormalities. Stillbirths can be partially addressed by **RPR Screening for Syphilis** during pregnancy. Neonatal tetanus was not observed, suggesting that **EPI** is performing well. Low birth weight demands further attention on both **maternal nutrition** and on malaria prevention in pregnancy (**IPT**). Birth injury demands more attention on **quality obstetrical care**. See below.

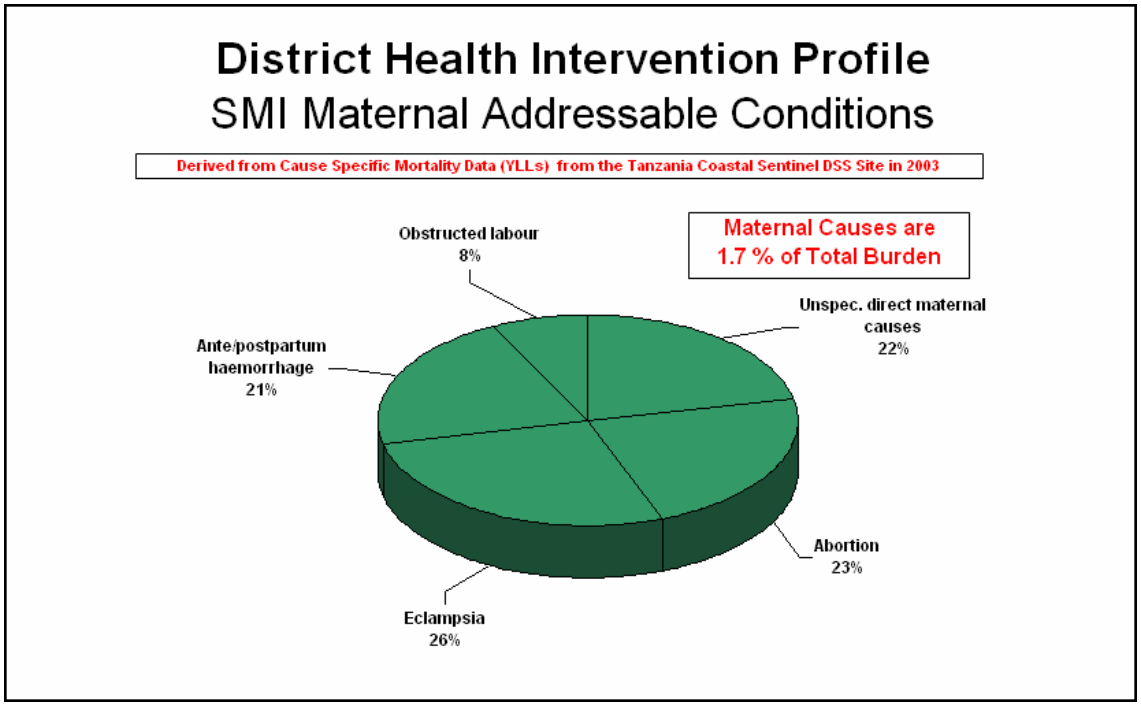
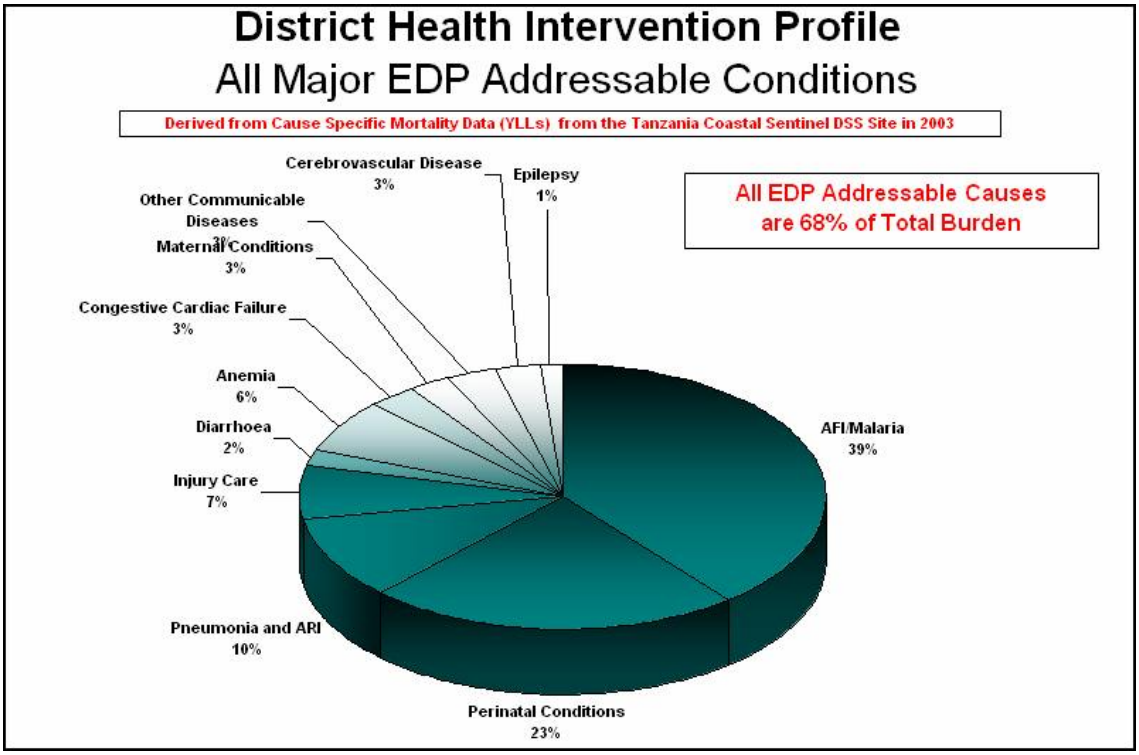


Figure 14. Safe Motherhood (SMI) Maternal Addressable Conditions
The above graph shows the causes for the 1.7% of total burden due to maternal mortality. These are usually sepsis, eclampsia, unsafe abortions, haemorrhage, and obstructed labour. Malaria, anemia and HIV/AIDS are also indirect causes. These can be addressed by **Life Saving Skills, Family Planning, Antenatal Care, IPT for Malaria, STD Syndromic Management, Postpartum Care, Post-abortion Care** and **Quality Emergency Obstetric Care** including essential obstetric drugs (e.g. oxytocins), equipment (e.g. resuscitation), and supplies (e.g. oxygen and blood) and **TBA Training**.



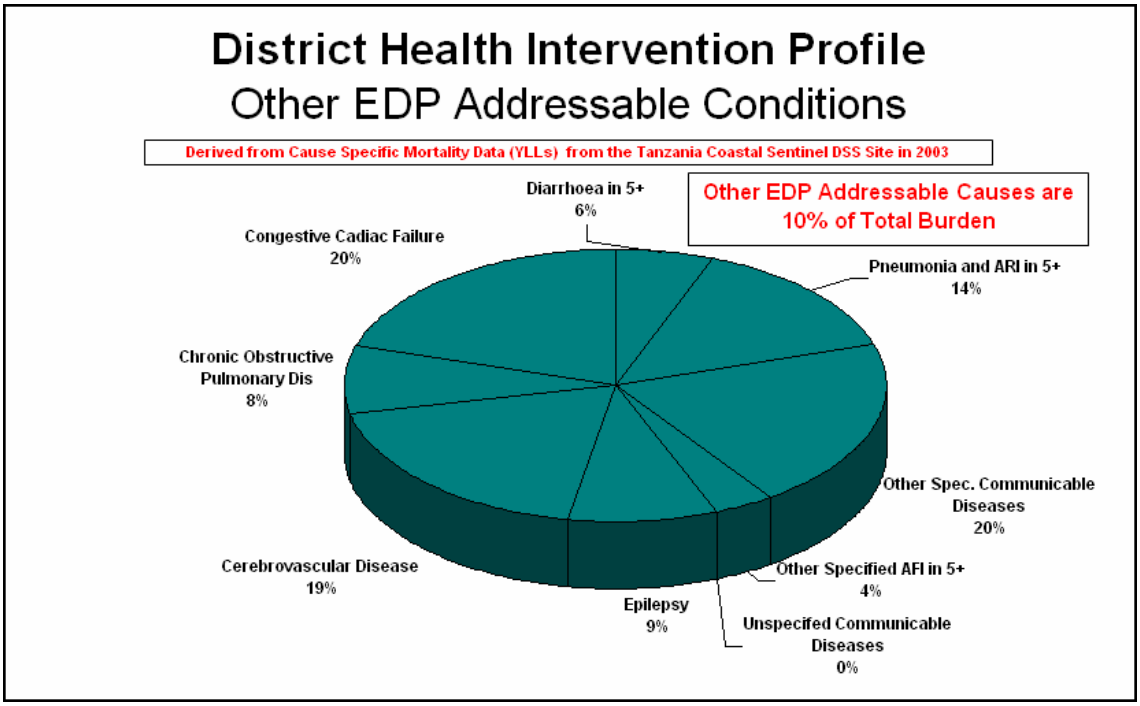


Figure 15. Essential Drug Program (EDP Lists for Kit or Indent) Addressable Conditions
Here we show two graphs for essential drug lists to emphasize the profound importance of maintaining adequate supplies. The EDP kit for Tanzania has been well designed for the existing burden of disease and addresses 68% of the total burden (top graph). Most essential drugs are delivered through essential health interventions already listed in this document, but some have no specific package. This remainder of the EDP kit contains drugs and materials useful for additional care aimed at morbidity reduction and mortality. These additional causes amount to about 10% of the total burden of disease (bottom graph) and include diarrhoea, pneumonia and ARI in people five years and older as well as a number of communicable and non-communicable diseases such has **helminthic infections, epilepsy, hypertension and cardiovascular conditions.** These considerations are important to bear in mind for those districts converting to the Indent system for essential drugs.

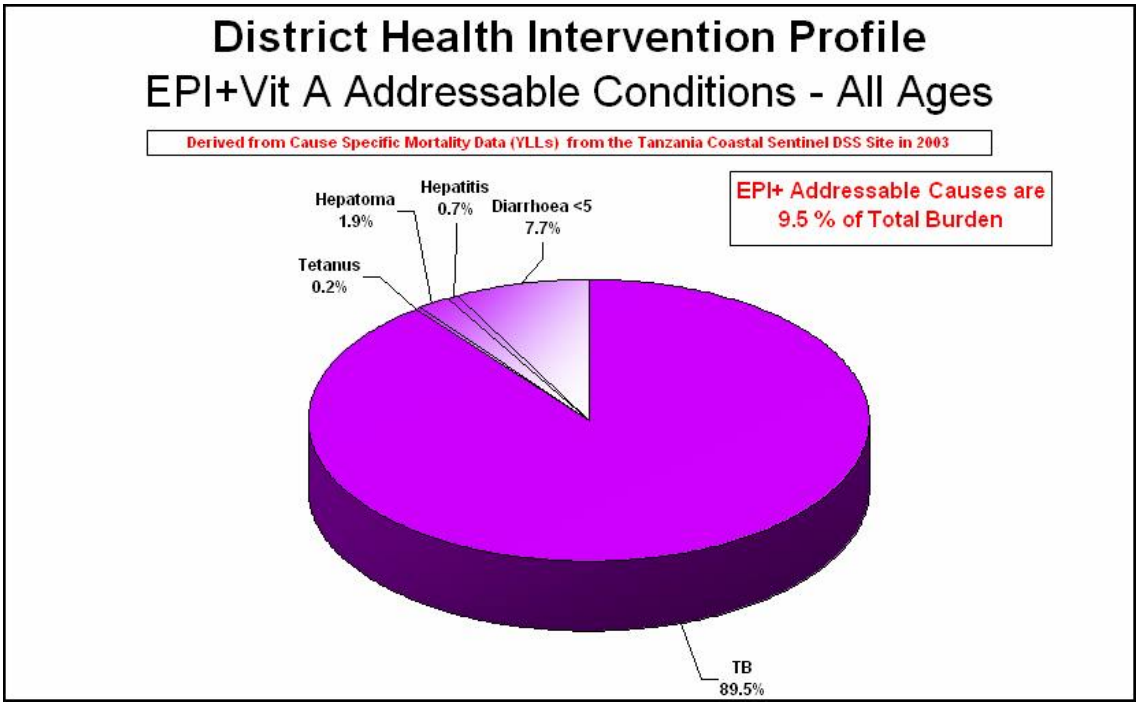


Figure 16. Expanded Program on Immunization Plus (EPI+) Addressable Conditions
The above graph illustrates the success of **EPI+** as an essential health intervention. The current high coverage of **EPI+** has reduced a previously high burden to only 9.5% of the total burden. Remaining causes are tetanus, and hepatitis, however TB is rising due to HIV. This illustrates the importance of maintaining **EPI+** at high coverage and supporting additional interventions for measles (e.g. **IMCI**), Tetanus (e.g. **SMI**), TB (e.g. **TB DOTS**) and **EPI+ with Vitamin A Supplementation** for diarrhoea and measles mortality reduction in under-fives.

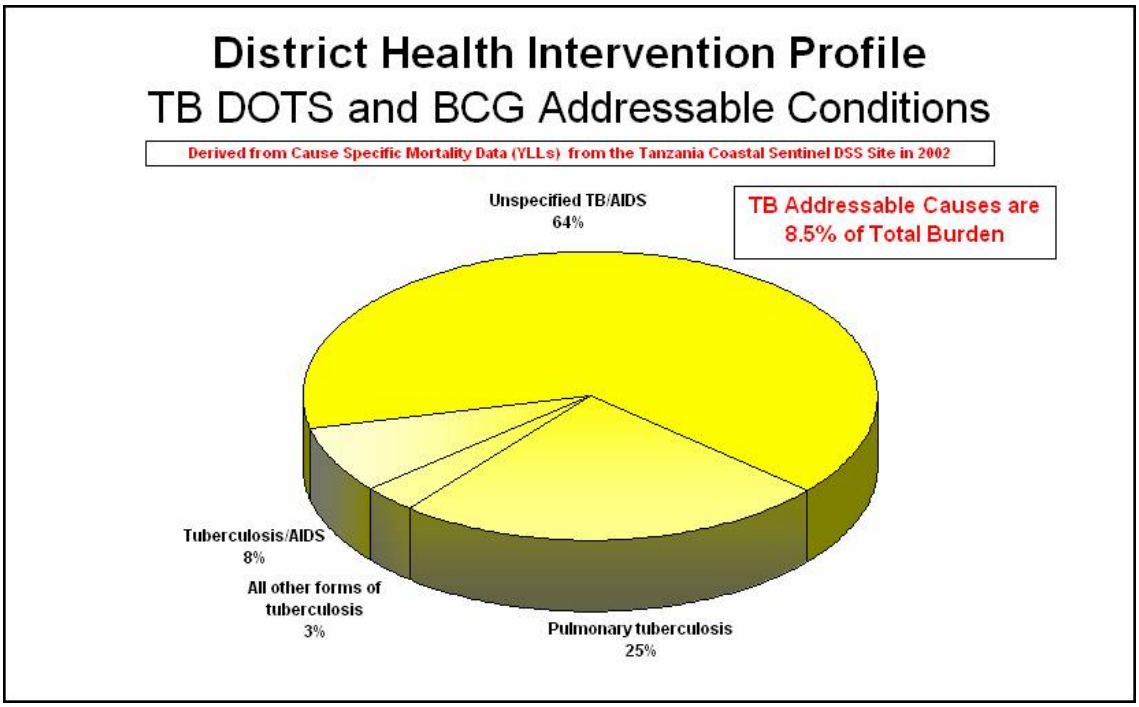


Figure 17. TB Directly Observed Treatment – Short Course (TB DOTs) addressable conditions
TB accounts for 8.5% of the burden of disease in 2003, up from 5% in 1999. HIV is believed to increase the risk of TB mortality. This illustrates the importance of increasing the coverage and integration of TB **DOTS** and **STD Syndromic Management** as well as maintaining high **BCG** immunization coverage in newborns.

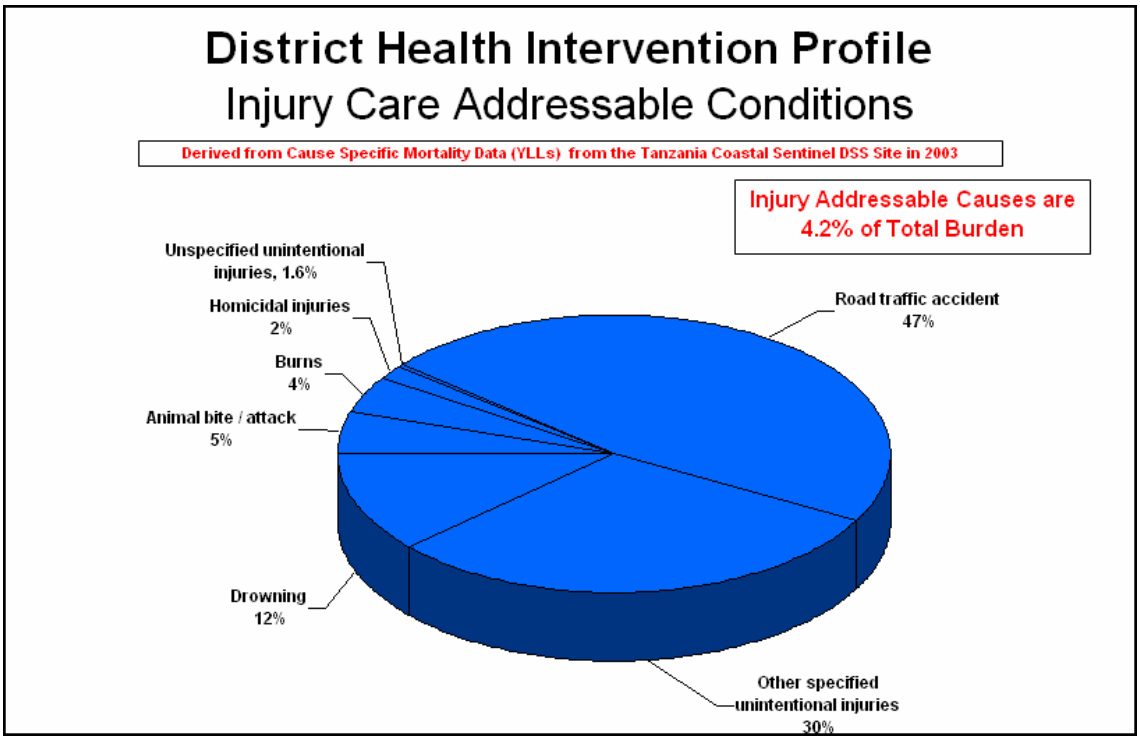


Figure 18. Injury Care Addressable Conditions
The above graph illustrates the relatively low (4.2%) but important burden of disease that can be addressed through life-saving interventions for injuries through adequate risk avoidance and injury care. This shows the importance of maintaining a regular supply of **Essential Drug Kits** and other supplies that include materials for **Injury Care**. It also suggests the need for appropriate **Inter-sectoral Interventions**, e.g. to address the risk of road traffic accidents. The pattern of injuries will vary greatly between districts depending on the nature of roads, which affects road traffic accidents, and the proximity to wild life, which determines risk of animal attacks. Drowning is a common cause of fatal injury in the Coastal Sentinel. **School** Health Programs should consider rescue, first aid, and swimming instruction at primary school level. The fatal animal attacks in the DSS area include snakebite. Adequate stocks of anti-venom should be kept available at dispensaries. In districts where suicide or homicide are occurring, health planners may need to consider mental health interventions.

Part 3: Other DSS Data Useful for Planning Purposes

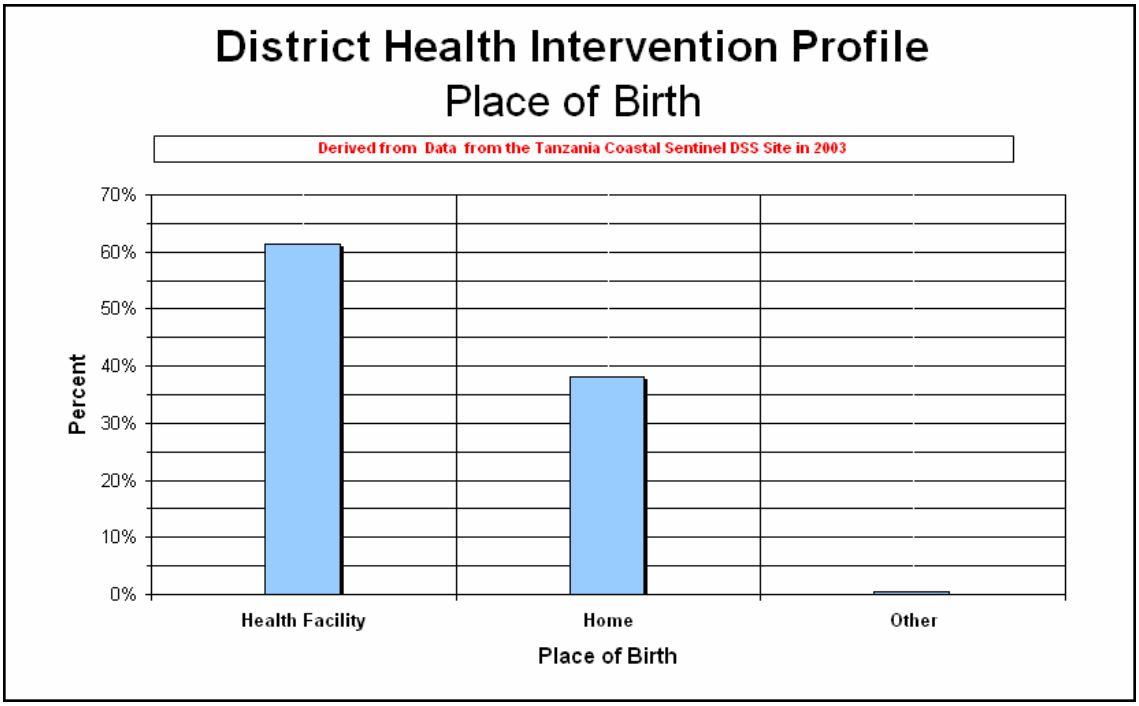


Figure 19. Place of Birth
The above figure illustrates that over one half of births occur in health facilities and about 40% at home. This rate of births in health facilities is higher than the national average of 44% for rural mainland Tanzania recorded in the 1999 Tanzania Reproductive and Child Health Survey (DHS / TRCHS).

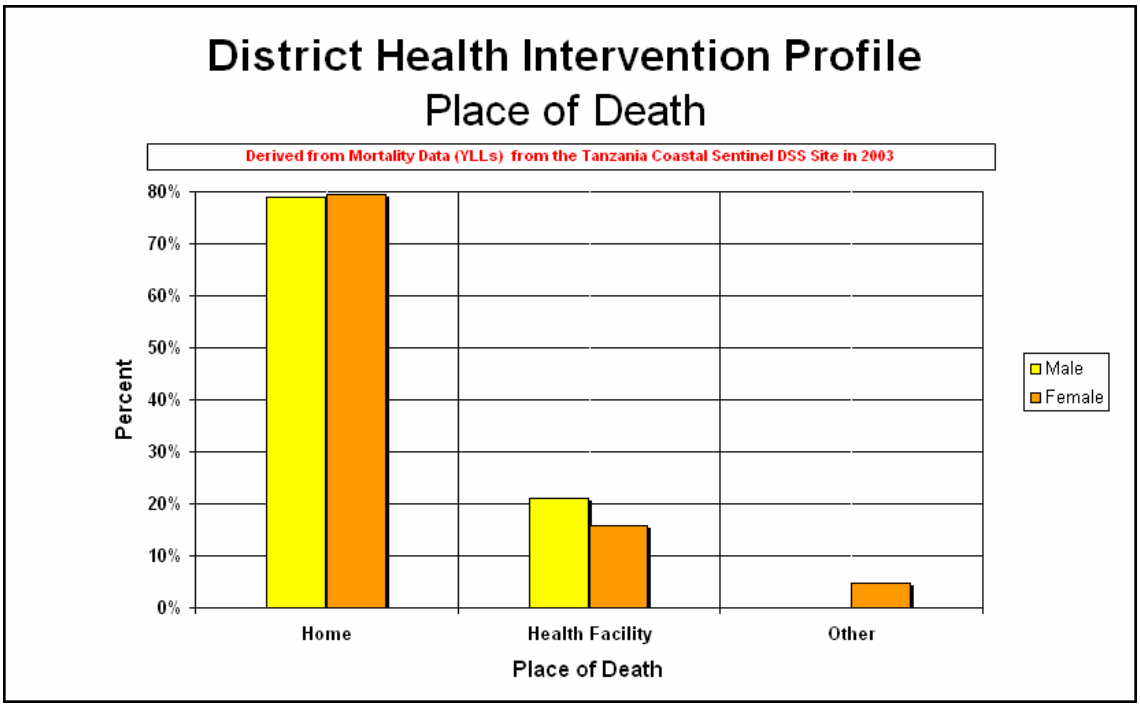
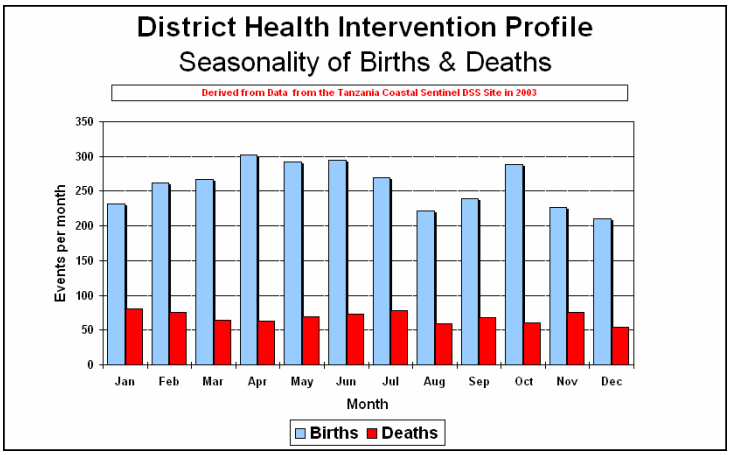
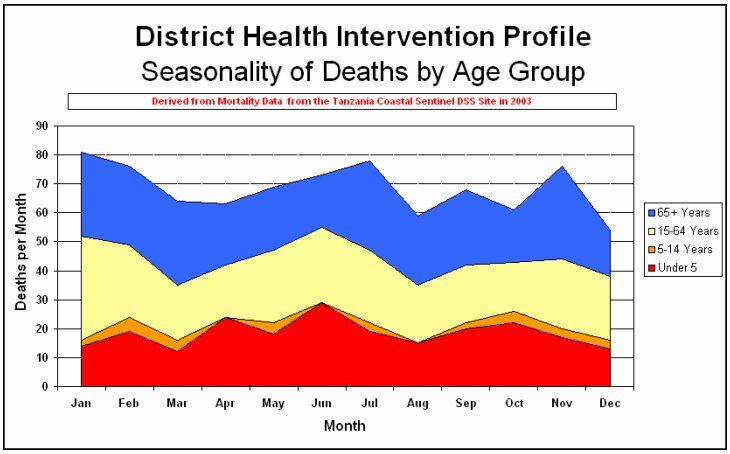


Figure 20. Place of Death
The above graph shows that about 80% of all deaths occur at home. This emphasizes the need to consider household-based data when assessing the burden of disease in the population, and not only HMIS health facility data. There is no gender difference.





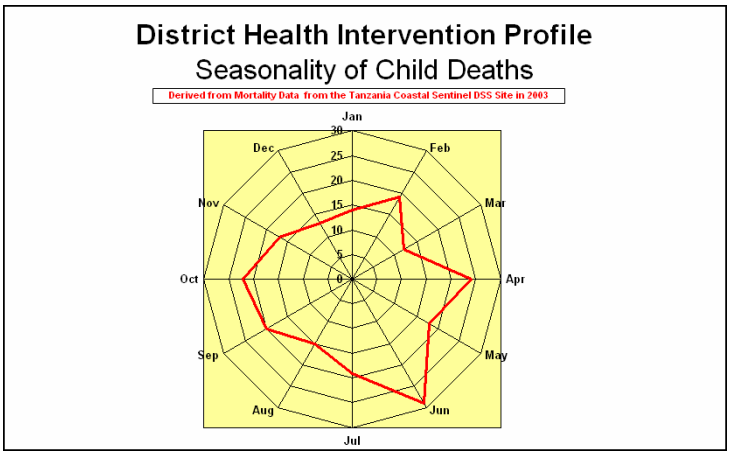


Figure 21. Seasonality of Births and Deaths

The top figure above shows monthly births and deaths in 2003 where the DSS area recorded an average of 258 births and 70 deaths per month. The second shows monthly deaths in children under 5 years; school aged children 5-14 years; adults 15-64 years; and the elderly 65 years of age and older. The third figure shows mortality in children under five which rises to a peak during and at the end of the long rains and declines in the dry season. This general pattern is consistent with malaria as the single largest disease component contributing to the burden of disease in children, which also peaks during the rains. Mortality in other ages is relatively constant over the year. The seasonal peaking in the rainy season was less visible in 2003 due to the failure of the long rains and consequent less risk of malaria and pneumonia.

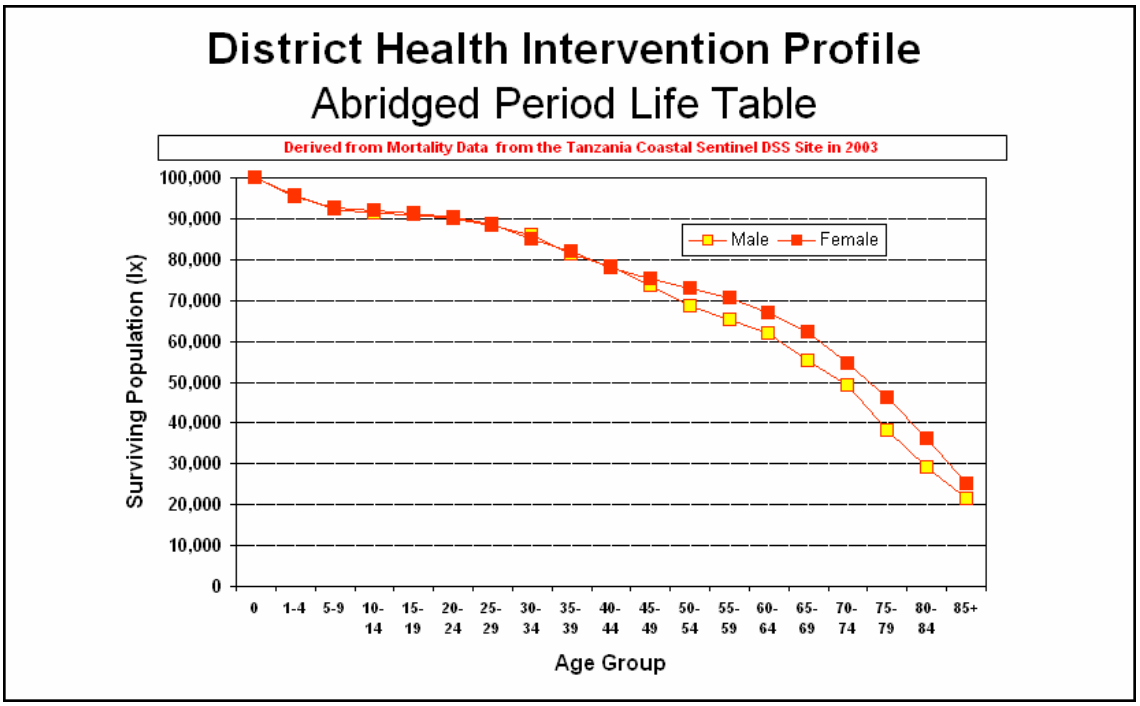


Figure 22. Abridged Life Table Survival Curve for Males and Females in 2003.
The above figure shows the survival of a hypothetical cohort of 100,000 males and 100,000 females, if born in 2003 and exposed to current risks of mortality. Males and females have similar survival until age 45 when the biological survival advantage of women over men becomes evident.

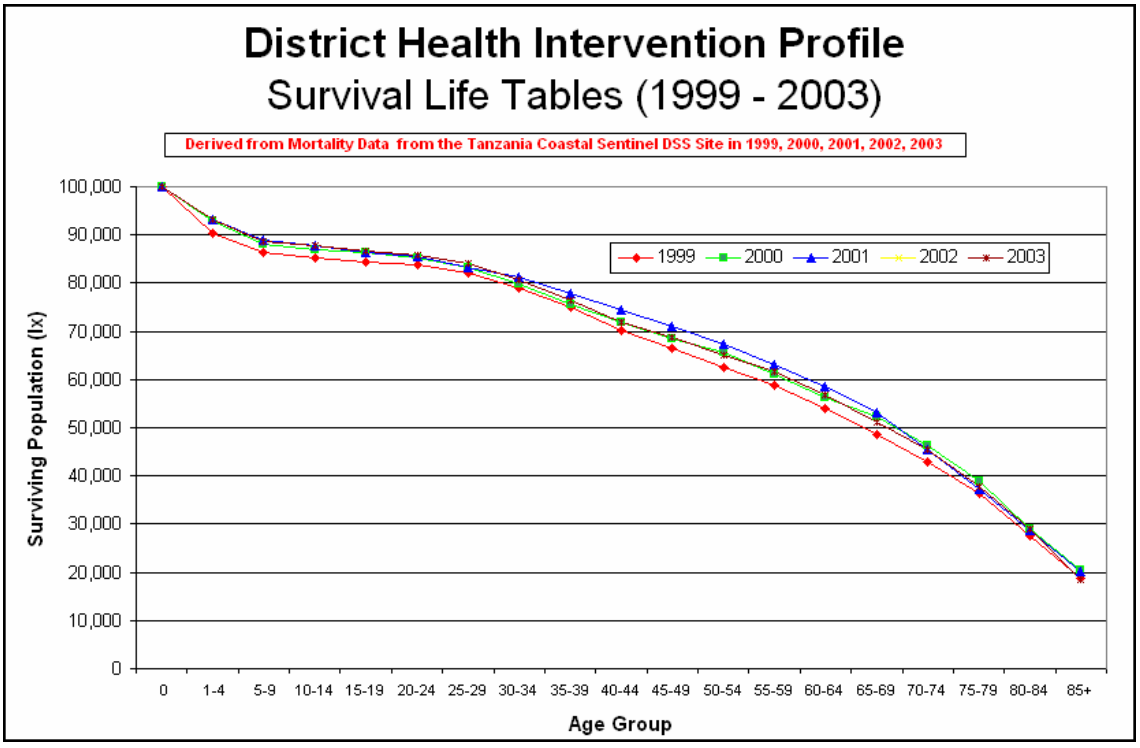


Figure 23. Abridged Life Table Survival Curves for 1999, 2000, 2001 and 2003.
This figure shows the abridged total population life table (males and females combined) for each of the past five years, showing a slowly improving situation for survival across all ages.

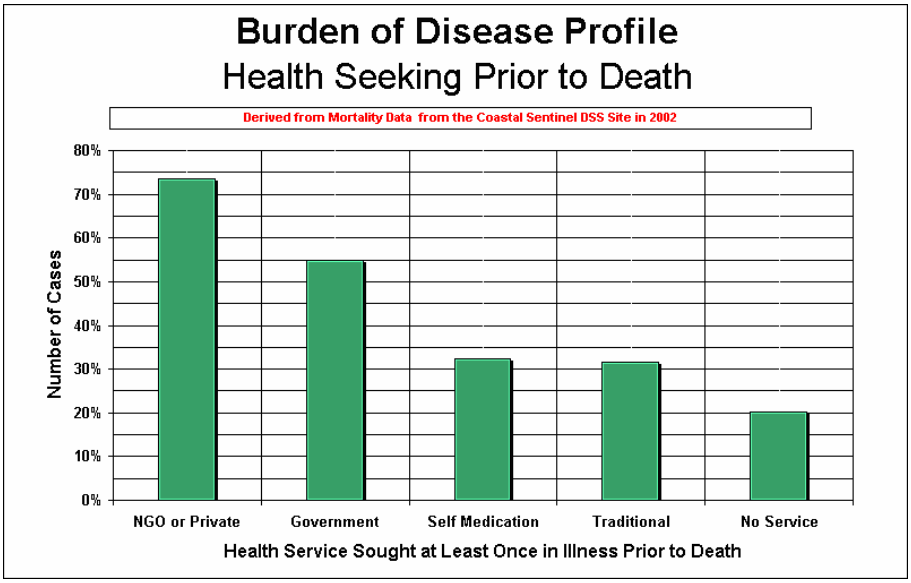


Figure 24. Main Types of Health Services Sought in the Illness or Condition Leading to Death
People often seek health services from more than one source. For serious illness or conditions leading to death, the above graph illustrates the distribution of services sought at least once. **Most deaths included formal or modern health seeking behaviour** (government, non-government, or private hospitals, health centers, dispensaries, pharmacies and/or village health workers). Fewer included informal (self-medication, shop keepers) or traditional services (traditional medicine, traditional healers) while 20% used no service at all. This pluralism in household level health seeking during life threatening illness illustrates the need for a comprehensive District Health Plan engaging all partner providers to ensure that the population has acceptable access to essential health interventions and information. This also illustrates the need to consider information from a broad range of health providers in the new design for a facility-based information system as part of the District's Health Management Information System (HMIS).

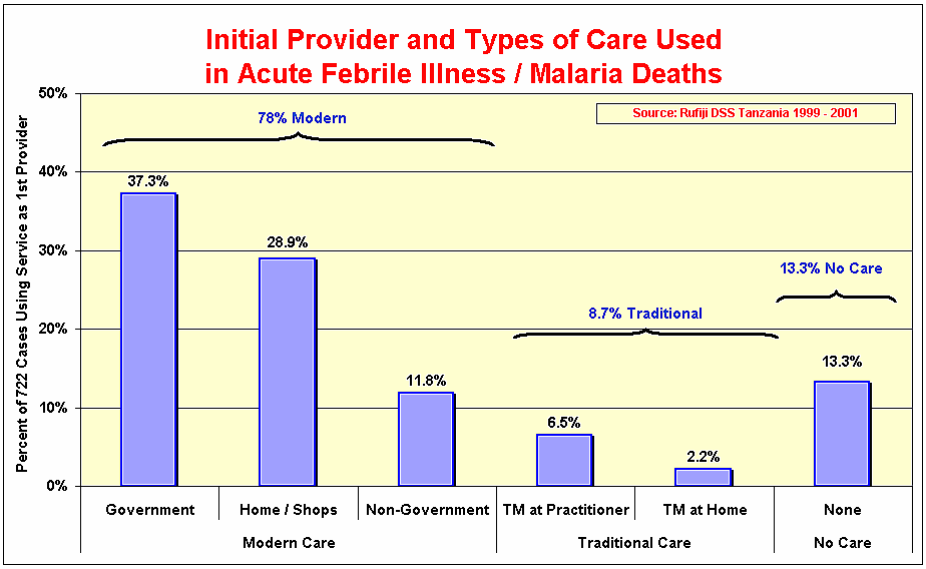


Figure 25. Initial Care Seeking for Fatal Acute Febrile Illness and Malaria.
Care seeking patterns are dependent on many factors, including the nature of the illness itself. Here we show initial (first choice) care seeking patterns for any deaths syndromically diagnosed as acute febrile illness or malaria. It shows that **modern care from government providers is the predominant choice** in rural areas and emphasizes the need to ensure high quality services when patients arrive, and to promote recognition of danger signs at home, appropriate home care, and prompt care seeking when required.

Part 4. Projecting DSS Sentinel Data to Other Districts

The information provided in Parts 2 and 3 can be used by Districts with socio-economic, epidemiologic, and health service profiles similar to Rufiji District. In Part 4, Rufiji District DSS rates are applied to the expected populations of Rufiji and other similar districts to derive district specific estimates in Coast, Lindi, Mtwara, and Tanga Regions. This section summarizes some key indicators generated by demographic surveillance that can be used for estimating local populations at risk of particular disease burdens, or in need of particular interventions.

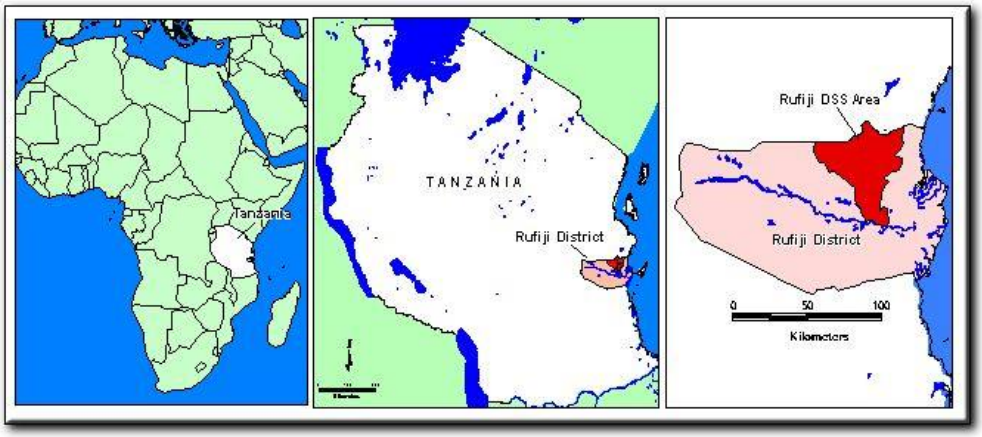


Figure 26. Map of Location of the Rufiji DSS Sentinel Area.
The above map indicates the location of the area in which the Rufiji DSS operates. The entire population of over 88,000 people in 18,600 households in this area is monitored continuously for births, deaths, in-migrations and out-migrations, with verbal autopsies on all deaths. This area is at the mid-point of the coastal border of Tanzania and is selected to be representative of rural coastal districts of the country. See also the figure, below.

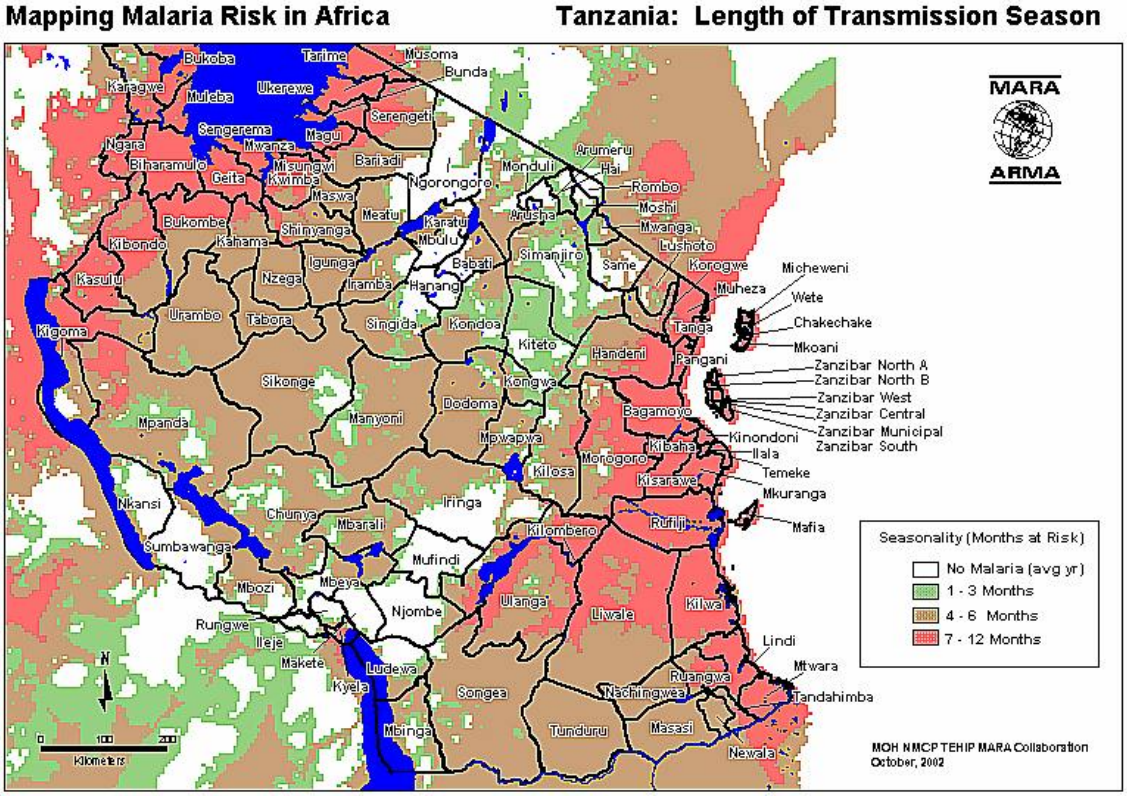


Figure 27. Map of Malaria Transmission Risk in Tanzania
The above is a map of Tanzanian rural coastal districts with respect to risk of malaria transmission. Malaria is the single largest component of the burden of disease in the Rufiji DSS sentinel data. This adds weight to the relevance of sharing Rufiji DSS data with other coastal districts.

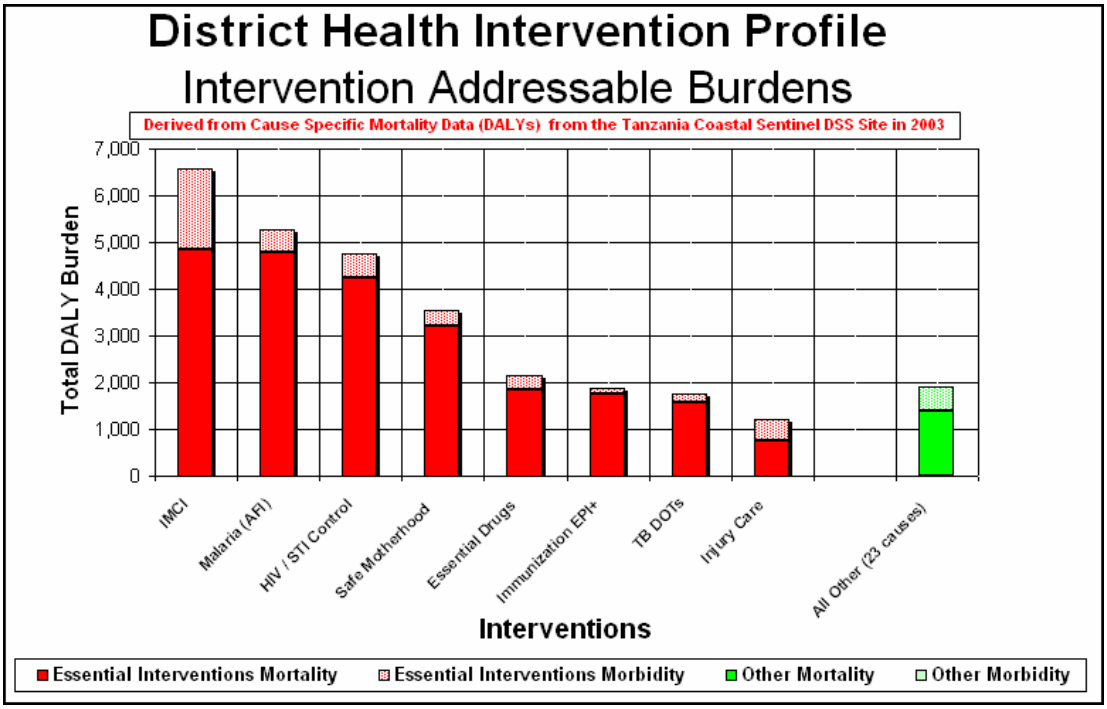


Figure 28. The effect of including disability.
This graph shows the effect of including disability as well as mortality in determining the relative shares of the burden of disease addressed by each intervention. Mortality is relatively easy to measure objectively and has been used as the basis of these profiles. Morbidity is much more difficult and costly to measure. In this graph we have modeled the expected morbidity for each cause of mortality to derive an estimate of the Disability Adjusted Life Years (DALYs)(see End Note). The ratio's used in the model are from the WHO Burden of Disease analysis for 2002 for AFRO E countries (those with very high child and very high adult mortality). In comparing the pattern in this graph to that in Figure 5 which uses only mortality data, there is no difference in the relative ranking in disease burdens addressed by each intervention. Hence we can, for the moment and for these purposes, continue to use years of life lost due to mortality in place of the full DALY. It should be noted that any large, non-fatal burdens of disease that are not associated with mortality will be missed by this approach (e.g. mental health, depression).

Table 1. Trends in Indicators and Statistics in the Rufiji DSS Sentinel area.
The table below compares a selection of demographic measures obtained in the Rufiji DSS Coastal Sentinel area to those obtained in previous years in Rufiji and in the most recent national DHS survey for rural mainland Tanzania.

Selected Rates, Statistics and Trends from the Tanzania NSS Coastal Sentinel DSS Area

Indicator	Units	Rural Tanzania Value** 1995-99	Coastal DSS Value* 1999	Coastal DSS Value* 2000	Coastal DSS Value* 2001	Coastal DSS Value* 2002	Coastal DSS Value* 2003
Crude Birth Rate	Births per 1,000 population	41	42.3	41.6	41.3	39.9	39.2
Crude Death Rate	Deaths per 1,000 population	13.0***	15.4	13.3	12.8	13.1	10.5
Crude Rate of Annual Increase	Change per 100 population excluding migration	2.8%	2.7%	2.8%	2.9%	2.7%	2.9%
Still Birth Rate	Still births per 1000 live births	n/a	12.9	14.9	13.4	16.6	14.5
Infant Mortality	Probability of dying before 1st birthday / 1,000 (1q0)	113.4	107.8	75.6	69.0	69.3	46.3
Under Five Mortality	Probability of dying between birth and 5th birthday / 1,000 (5q0)	166.8	135.5	118.5	110.1	114.3	75.4
Adult Mortality	Probability of dying between age 15 and age 60 / 1000 (45q15)	n/a	312.6	297.4	282.3	289.6	257.4
Maternal Mortality Ratio	Maternal deaths per 1000 live births	5.3***	5.2	5.7	2.5	5.1	3.5
Life Expectancy	Life expectancy at birth in years	53.0***	55.8	58.0	58.1	58.1	62.1
Total Fertility Rate	Children per woman 15-49 years old (avg)	6.5	6.2	6.2	6.1	5.8	5.8
Dependency Ratio	People <15 years or >64 years per 100 people 15 to 64	104	112	111	109	110	111
Average Household Size	People per household	5.0	4.8	4.9	4.2	4.7	4.7

* Source: Rufiji Demographic Surveillance System data for 1999, 2000, 2001, 2002 and 2003 (Part of the National Sentinel Surveillance System)
**Source: National Bureau of Statistics, and Macro International Inc. Tanzania Reproductive and Child Health Survey, 1999 (TRCHS DHS)
***Source: National level values from Population Reference Bureau, 2001 World Population Data Sheet, Tanzania (PRB)

Table 2. Trends in Mortality in the Rufiji DSS sentinel area.

There are many ways to express mortality indicators. Here we show a variety of measures. They are internally consistent with the fact that infant, under-five and adult mortality has declined in the Rufiji DSS area by about 54%, 47%, and 18% respectively since 1999. This indicates movement in a good direction despite the increasing prominence of HIV/AIDS and TB mortality in the District. The large drop in 2003 may have been assisted by the lighter than average rainfall that year and may rebound in 2004.

Infant Mortality in Rufiji District (excluding still births)

Type of Measure	Definition / Units	(1998)	1999	2000	2001	2002	2003	%Change
Probability	of infant death by age 1 (1q0) per 1000 children at birth	113.4	97.8	72.0	69.0	69.3	46.3	52.7%
Ratio	of infant deaths per 1000 live births	n/a	100.1	66.5	66.5	68.1	46.6	53.4%
Rate	of infant deaths per 1000 infant person years	n/a	107.8	75.6	72.2	72.7	47.7	55.7%
Source: Coastal (Rufiji) DSS except for 1998 from the TRCHS (DHS) of 1999.			Average decrease since 1999					53.9%

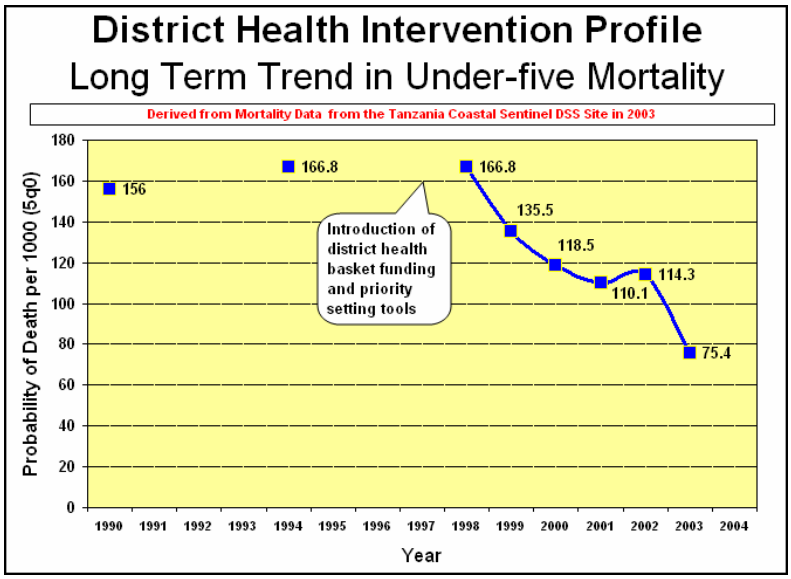
Under Five Mortality in Rufiji District (excluding still births)

Type of Measure	Definition / Units	(1998)	1999	2000	2001	2002	2003	%Change
Probability	of death by age five (5q0) per 1000 children at birth	166.8	135.5	118.5	110.1	114.3	75.4	44.4%
Ratio	of under five deaths per 1000 live births	n/a	131.5	102.6	102.6	108.3	74.0	43.7%
Rate	of under five deaths per 1000 under five person years	n/a	34.0	25.1	25.1	26.1	16.5	51.4%
Source: Coastal (Rufiji) DSS except for 1998 from the TRCHS (DHS) of 1999.			Average decrease since 1999					46.5%

Adult Mortality in Rufiji District

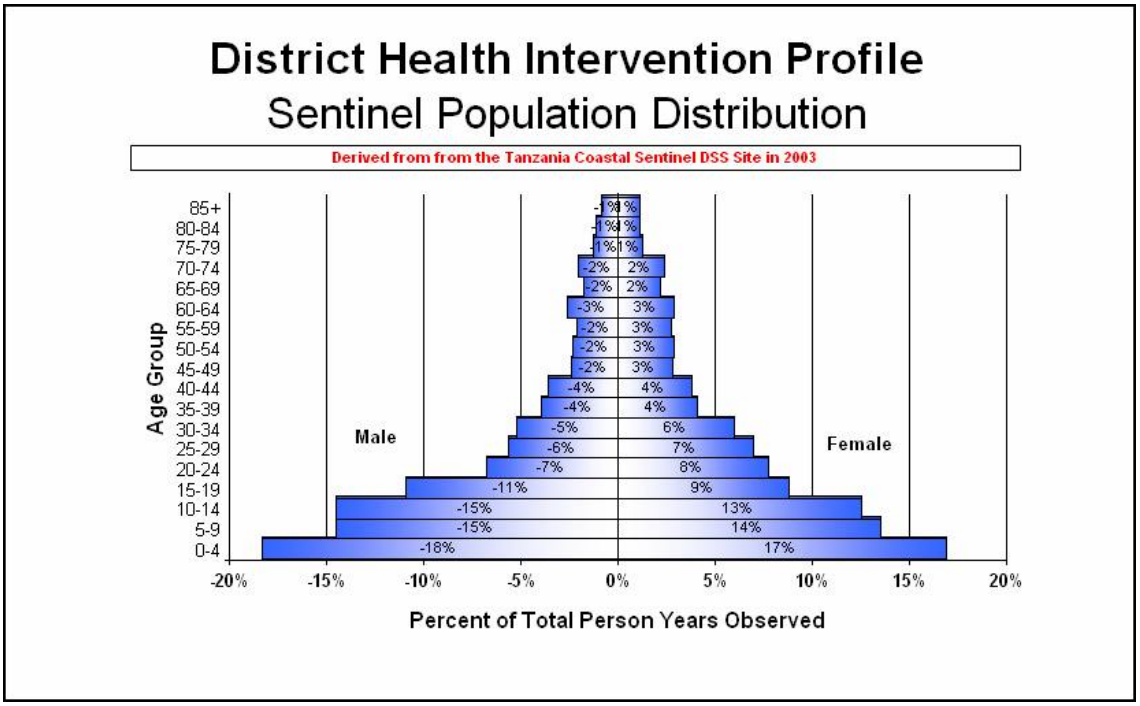
Type of Measure	Definition / Units	(1998)	1999	2000	2001	2002	2003	%Change
Probability	of death between age 15 and 60 (45q15) per 1000	n/a	312.6	297.4	282.3	289.6	257.4	17.7%
Source: Coastal (Rufiji) DSS except for 1998 from the TRCHS (DHS) of 1999.					Decrease since 1999			17.7%

Figure 29. Long-term trend in child mortality in the Coastal sentinel DSS area.



This figure shows one example of the trend in mortality in this sentinel DSS area. The points between 1990 and 1998 are taken from the 1992, 1996 and 1999 DHS surveys for the rural coastal zone. The points from 1999 onward are from the Coastal Sentinel DSS in Rufiji District. Like much of Tanzania, mortality declines stagnated in the early 1990's. However, soon after the introduction of pilot **District Health Basket Funding** in 1997 in Rufiji (now available in all other districts), mortality began to decline again. At this rate of decline in Rufiji, the **Millennium Development Goals** for child mortality will likely be met well ahead of schedule. In Rufiji, this has been achieved by using incremental basket funding for **scaling up coverage of essential health interventions and for health system strengthening**. This strengthening included access to these annual District Health Intervention profiles for priority setting as well as the use of tools for budget mapping in the planning cycle to align plans with priorities.

The question is often raised that because mortality is changing in the sentinel area, the profile may no longer have **relevance to other districts**. In response, it should be appreciated that the profile focuses on proportional mortality and not absolute mortality. Hence the relative priority of interventions changes very slowly even though mortality can drop quickly. The ranking of the top 10 interventions in 2003 is almost exactly the same as it was in 1999 before the mortality started to drop. The proportional burden addressable by IMCI (which has contributed much to the success in the mortality reduction) has decreased from 41% to 25%, but it is still the first ranked intervention. Malaria interventions have dropped in share from 37% to 26% but still have the same rank. The only other intervention in the top ten that has changed place is that for HIV which has steadily moved higher in addressable burden shares. Hence the priorities as determined by this approach are broadly generalizable to other rural districts in coastal Tanzania.



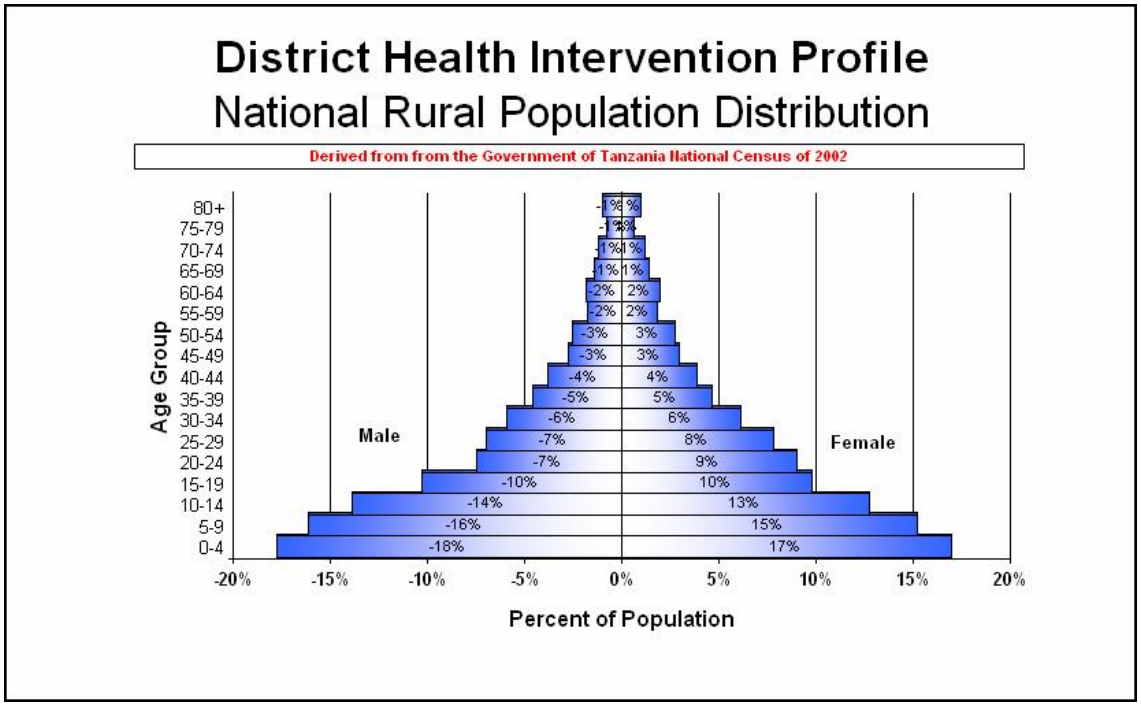


Figure 30. Population Distribution by Sex and Age by 5 year Age Groups
The above graphs display the age and sex distribution of the sentinel population during the year 2003 in the Rufiji DSS area and the national rural population from the 2002 census. These graphs reflect the combined impact of births, deaths and migration over the past 100 years on the structure of the currently living population. The wide base of the pyramid is characteristic of a population with a combination of both high fertility and high child mortality. It indicates that the majority of the population is children, and that there is a high dependency of large numbers of children and, to a much lesser extent, the elderly on a relatively small adult population. Because of their large numbers, child and young adult health problems will continue to dominate the public health priorities of this area for many years to come. It can also be seen that most of the child mortality occurs in the first years of life. It can also be seen that the **Rufiji sentinel DSS population has similar structure to the rest of rural Tanzania**. Extrapolations from this structure can be used to estimate district-wide populations in different age groups in need of specific public health services. These are provided in Table 3 below.

Table 3. Projecting the Sentinel DSS rates to other rural Coastal Districts for 2005.

Demographic Projections for 2005 based on the Tanzania NSS Coastal DSS Sentinel for Other Rural Coastal Districts*

Indicator	Demographic Projections to Rural Coastal Districts (North to South)										
	Muheza	Pangani	Bagamoyo	Kibaha	Kisarawe	Mkuranga	Rufiji	Mafia	Kilwa	Lindi	Mtwara
District Population*	294,787	46,505	242,440	138,964	100,932	197,926	213,887	42,943	181,123	227,528	216,170
Projected Population of Infants	11,202	1,767	9,213	5,281	3,835	7,521	8,128	1,632	6,883	8,646	8,214
Projected Population 0-4 years (Children)	51,735	8,162	42,548	24,388	17,714	34,736	37,537	7,536	31,787	39,931	37,938
Projected Population 5-14 years (School Aged)	81,037	12,784	66,647	38,201	27,746	54,410	58,798	11,805	49,791	62,547	59,425
Projected Population 15-64 years (Adult)	139,493	22,006	114,723	65,758	47,761	93,659	101,211	20,321	85,707	107,666	102,292
Projected Population 65+ years (Elderly)	22,492	3,548	18,498	10,603	7,701	15,102	16,320	3,277	13,820	17,360	16,494
Projected Population Female 15-49 years (Maternal)	61,640	9,724	50,694	29,057	21,105	41,386	44,724	8,979	37,873	47,576	45,201
Projected Number of Births	11,567	1,825	9,513	5,453	3,961	7,767	8,393	1,685	7,107	8,928	8,483
Projected Number of Deaths	3,092	488	2,543	1,458	1,059	2,076	2,244	450	1,900	2,387	2,268
Projected Number of Under Five Deaths	780	123	642	368	267	524	566	114	479	602	572
Projected Number of Maternal Deaths	41	6	34	19	14	27	30	6	25	32	30

* Note: Projected District Populations are the official district populations for 2004 for Council Health Basket Allocations as set by the Ministry of Health for 2004/05. All other projections are based on the Rufiji sentinel population structure and rates.

Part 5. Summary and Conclusions

Selecting from the National Package of Essential Health Interventions. This burden of disease profile from a typical rural coastal district in Tanzania demonstrates the importance of investing in a core group of Minimum Essential Health Interventions.
For such rural districts, these include:

- **IMCI** (Integrated Management of Childhood Illnesses) for under fives;
- **Malaria Case Management** (using the new National Guidelines including IPT as below);
- **IPT** (Intermittent Presumptive Therapy) for malaria control in pregnancy;
- **ITNs** (Insecticide Treated Nets) for malaria prevention for all, especially children and mothers;
- **STI / HIV Control** (Sexually Transmitted Infection Syndromic Management), including condom promotion, strengthening Blood Transfusion Services, School Health Education and Youth; Interventions for in-school and out-of-school youths, Sex Worker Interventions, etc.);
- **SMI** (Safe Motherhood Initiative) including ante and postnatal care, IPT as above, delivery care, family planning, etc.;
- **EDP** (Essential Drugs Program) kits or Indent;
- **EPI Plus** (Expanded Program on Immunization with Vitamin A Supplementation);
- **TB DOTs** (Tuberculosis Directly Observed Therapy)
- **Injury Care** (Rule of Rescue, School Health Programs, etc.)

Disease elimination programs are also highly cost-effective, even though the remaining burden of disease may be too small to appear significant in a burden of disease approach. Where there are national programs for disease elimination (e.g. **lymphatic filariasis, onchocerciasis, polio, trachoma**, **iodine deficiency disorder,** etc) available in the district, these should also be considered essential health interventions and deserve high priority, along with the interventions listed above.

It must be stressed that the burden of disease reflected in this profile is the burden remaining in the face of the current health system and interventions at their current levels of coverage. Where coverage of preventive interventions is high (such as with EP) the remaining burden is low. Despite the low burden, such interventions must be maintained at high coverage, or the previously averted burden will return. Where other intervention coverages are low, such as with IMCI for under-fives, ITNs for malaria, and interventions for HIV/TB, the remaining burden is still high. This illustrates the importance of using any new funding (e.g. Council Health Basket Grants) for such purposes, rather than redirecting funding from previously successful preventive interventions.

Potential Gains. Collectively, these essential interventions will address about 92% of the total burden of disease of the population. If coverage of these ten strategies can approach 80% of those at risk, substantial reductions in the burden of disease can be expected. Conversely, investing in interventions that do not address these conditions, or investing in less cost-effective interventions that target these high-burden conditions, will have only marginal impact on the overall burden of disease and will dilute and distract human and fiscal resources from more cost-effective interventions. In most cases, this will also divert resources away from the interventions that primarily benefit the poor and neediest and towards those that primarily benefit the relatively better-off members of the community. In other words, such investment decisions will usually be inequitable as well as inefficient.

Recent Trends. In Rufiji District, coverage of EPI and IMCI is high, while coverage of ITNs is moderate but increasing. Health services are improving due to judicious use of health basket funding. Mortality in children is falling. Between 1999 and 2003 there was a 47% reduction in all-cause under-five mortality and a 54% reduction in infant mortality. Coverage of interventions for adults is unknown and is probably low for STI Syndromic Management and TB DOTS. The burden of disease from HIV and TB is increasing. This has retarded some of the health gains; nevertheless, the net effect of improved services is that adult mortality has declined 18% over the past five years. The overall burden of disease for the whole population has declined by about 30% (from 333 YLLs per 1000 person years observed in 1999 to 232 YLLs per 1000 person years observed in 2003). As a consequence, life expectancy is increasing (53.0 years in 1999; 62.1 years in 2003). It should be noted that although child mortality is declining, it is still unacceptably high and is 21 times higher than maternal mortality, even though maternal mortality is also unacceptably high. It is increasingly likely that the decline in mortality is due to health system interventions although it may also be due to the variation in mortality risks moderated by climate, food security, or other socio-economic determinants. These figures will be compared with other DSS sites, and will be followed annually over time to build up a stronger picture of trends. The above observations point to the growing importance of including estimates of intervention coverage in the HMIS data set. Such information should prove an invaluable addition to burden of disease information in guiding the investment efforts necessary to extend the reach and access of essential health interventions to those in greatest need.

Part 6: Links for Further Information

For further information on this District Health Intervention Profile, contact:
IFAKARA HEALTH RESEARCH AND DEVELOPMENT CENTRE (IHRDC)
Box 78373
Dar es Salaam, Tanzania
Tel: 255 22 277 1714
Eml: hmasanja@ihrdc.org, honorati.masanja@unibas.ch or masanja@tehip.or.tz
Attn: Mr. Honorati Masanja

For further information on the use of DSS mortality data for other districts in the National Sentinel Surveillance System (NSS), contact:
HEALTH MANAGEMENT INFORMATION SYSTEM
Department of Policy and Planning
Ministry of Health
Box 9083
Dar es Salaam, Tanzania
Tel: 255 22 216 0261

For further information on the Rufiji Demographic Surveillance System regarding characteristics of the population monitored, the methods used, and the basic outputs see:
Mwageni, E., Momburi, D., Juma, Z., Irema, M., and Masanja, H. et.al. (2002). **The Rufiji Demographic Surveillance System.** In*: INDEPTH Monograph Series: Population and Health in Developing Countries, Volume 1: Population, Health and Survival at INDEPTH Sites*. International Development Research Centre, Ottawa, Canada.

Or contact:
RUFIJI DEMOGRAPHIC SURVEILLANCE SYSTEM
Station Manager
Box 40
Ikwiriri, Rufiji District, Tanzania
Tel: 255 023 999 (ask for 31)
Eml: mwageni@suanet.ac.tz or hmasanja@ihrdc.org
Attn: Dr. Eleuther Mwageni or Mr. Honorati Masanja

End Notes:

[1] Since premature mortality represents almost 80% of the expected burden of disease in sub-Saharan Africa as estimated by the Disability Adjusted Life Year (DALY), the Burden of Disease Profile uses the mortality portion of the DALY (future years of life lost due to mortality or YLLs) as a proxy measure of the distribution of the burden of disease. All graphics showing the shares of the burden of disease are based on YLLs. These YLLs use standard DALY age weighting and discounting (3%). Cause specific mortality and associated YLLs are generated through longitudinal demographic surveillance in Rufiji District using the HRS Household Registration System and the NSS/AMMP verbal autopsy classification. The graphic on the front cover shows actual YLLs, and modeled YLDs to estimate the total intervention addressable DALYs. YLDs are modeled from the WHO 2001 YLL:YLD ratio for Africa E countries with very high child and very high adult mortality. It shows that adding disability does not change the intervention priorities as determined by YLLs alone.

[2]The next annual Coastal Health Intervention Profile for the year 2005 will be available by June 2005. The Rufiji DSS is a member of the INDEPTH Network of Demographic Surveillance System sites and as of March 2004 is managed by the Ifakara Health Research and Development Centre.

[3]The Tanzania Essential Health Interventions Project (TEHIP) and Ifakara Health Research and Development Centre (IHRDC) are funded in part by grants from the International Development Research Centre, Canada (IDRC) and work in collaboration with the Tanzania Ministry of Health. TEHIP and IHRDC gratefully acknowledge the staff of the Rufiji DSS and the verbal autopsy coders for their efforts in producing the data on which this profile is based.

Visit: www.indepth-network.net for the INDEPTH Network
Visit: www.ihrdc.org for the Ifakara Health Research and Development Centre
Visit: www.idrc.ca/tehip for the Tanzania Essential Health Interventions Project
Visit: http://web.idrc.ca/en/ev-64454-201-1-DO_TOPIC.html to view a short video on the Rufiji DSS site.

[4]**Poverty Monitoring.** The Demographic Surveillance Systems in Tanzania can also report all indicators disaggregated by socio-economic status in order to determine both access to health services, and health outcomes of the poorest quintile in comparison to the rest of the population. Such results are specific to the setting in which they are collected and are therefore not included in this profile. Contact IHRDC and TEHIP for specific reports on health inequalities as determined by DSS.