

Doctors on Safari

Kisaki, September 2011

1. Introduction

To improve the health of a community on a long term scale, it is imperative to consider both preventative and curative methods of controlling disease. This report aims to be holistic in its approach to current barriers of health in Kisaki village. This includes not only the biological and practical aspects of healthcare, but also the sociological, political and cultural factors that influence both physical and psychological wellbeing in this region. The report will start with a background to Tanzanian health, specifically the Morogoro region and Kisaki village, followed by a service evaluation of Kisaki clinic. Finally, it will address recommendations for the dispensary, public health and the Doctors on Safari Programme.

2. Background

In recent years there has been a gradual trend of improvement in Tanzanian health. Between 2004 and 2007, average life expectancy increased from 48 years, to 52 years of age in mainland Tanzania.¹ Although figures indicate a gradual development in general health, progress seems diminutive. The rank of Tanzania in comparison to other countries in regards to life expectancy has remained extremely poor, at only 170/191 countries within the last ten years.² The number of healthy life expectancy years (HALE) (without a debilitating disease or health condition) remains at 36 years of age, causing Tanzania to rank at only 176 out of 191 countries.³ It is important to examine the causes of mortality and suffering to include both disease and current health care systems to enable efforts to be focused appropriately. Causative diseases as well as barriers to existing health are discussed below.

A) General Health in Tanzania

Population

The population of Tanzania is currently estimated at 42 million, 44% of which are children under 15 years of age.¹ Annual population growth rates are currently estimated at 2.47% however it is questionable how reliable these figures are as of the estimated 1600000 births per year, only 8% are registered.⁴ Figures show that on average a woman living in rural Tanzania will have 5.5 children in her lifetime. Men on the other hand are reported to have on average 16 known children in their lifetime. This signifies a growing problem for Tanzania. With over 66% of people living under the poverty line of \$1 a day, it is obvious that unless growth rates slow, families will find it increasingly difficult to sustain themselves.^{4,5}

Women and Children's Health

Maternal mortality rates in Tanzania are extremely high in comparison to the world average. 2008 WHO statistics report 9% of all women who give birth in Tanzania, die in childbirth.⁴ This figure does not include maternal mortality from illegal abortion which is estimated at one in four.⁴ In addition to this, 12.6% of children die in rural Tanzania before the age of 5, and many do not even manage to survive the neonatal period due to birth asphyxia. (*For other causes of death in infants and neonates see Figures 1 and 2 in Appendix A*)

The most influential factors affecting maternal and infant mortality rates are:

- a) The attendance of a healthcare professional during labour

A staggering 63% of births are unattended by a health care professional in Tanzania, resulting in the extremely high mortality rates as described above.⁵

- b) The educational status of the mother.

As seen in figure 3, the greatest factor influencing mortality of under 5 year olds is the educational status of the mother.^{4,5} Although it could be argued that this is due to the increased wealth accompanied with higher educated women, it appears that wealth has a relatively small influence on rates of mortality.⁴ This acts as sound evidence that through educating women about childbirth, sexual health and child health, considerable progress can be made in this field.

Although relatives and traditional medicine practitioners have basic knowledge of the mechanisms of labour, it is obvious that more training and health care education is needed in this field, as well as increased human resources to enable healthcare professionals to attend home births. Education should be provided to include mechanisms of labour, complications of labour, and risks of abortion to allow women to informed decisions regarding their health.

Adult Health.

The current life expectancy in Tanzania averages at 48 years of age. Figure 4 illustrates the main causes of death. These are also explained below.

Human Immunodeficiency Virus (HIV/AIDS)

In 2006, HIV prevalence amongst adults in mainland Tanzania was reported to be 7%, as opposed to Zanzibar where current HIV prevalence is 0.6%.⁶ Although HIV rates have decreased slightly in recent years as a result of increased diagnostic facilities and programmes to prevent mother to child transmission, HIV is still accountable for 9% of all deaths under 5 years.⁴ This then poses the question of what has caused the extreme difference between the HIV rates in Zanzibar and mainland Tanzania. New evidence is emerging which suggests that Gonorrhoea and Chlamydia facilitate HIV transmission during heterosexual intercourse.⁷ A current study reveals that an estimated 27% of all men in mainland Tanzania have either Chlamydia or Gonorrhoea, based on a sample size of 15000 males.⁸ With only 53% of males reported to use condoms when having sexual intercourse with a stranger, it is apparent that increased education is required in terms of sexual health.^{7,8} Cultural attitudes and beliefs stand as obstacles to current interventions. This will be discussed in more depth later in the report.

Malaria is the leading cause of death for children under five and accounts for 14% of all deaths in adults.⁴ In recent years, there has been a marked decline in Malaria incidence due to the free access of long lasting insecticide treated nets for vulnerable groups and the deployment of indoor residual spraying.⁵ However, many of these interventions have been deployed to Zanzibar, and rural villages such as Kisaki has had poor access to these facilities, causing Malaria incidence to remain stagnant.

Lower Respiratory Tract Infection.

Accounting for 16% of all adult deaths, and 12% of all infant deaths under 5 years, lower respiratory tract infections are reported to be the second highest diagnosis in health care facilities in mainland Tanzania.⁹ Pneumonia unassociated with measles causes 70% of all LRTI deaths; post-measles pneumonia, 15%; pertussis, 10% and croup, 5%.⁹ Factors increasing the prevalence of LRTI's in Tanzania are: large family size, crowding, low birth weight, malnutrition, lack of vitamin A, lack of breast feeding, asthma, and immunological complications, most notably HIV/AIDS.^{9,10} It is uncertain to what degree the prevalence of Chlamydia affects respiratory problems in offspring in Tanzania, as there have been no studies conducted yet in this region, however there is a known correlation elsewhere in the world between Chlamydia infection of the mother and respiratory problems within the child. Again this highlights the need for increased education concerning sexually transmitted infections and care during pregnancy.¹⁰

Diarrhoeal Diseases.

Diarrhoeal diseases account for 8% of all adult deaths, 17% of all deaths under 5 years of age and is the fourth most common presentation within health care facilities in rural Tanzania.⁴ Incidence of diarrhoeal disease significantly increases during rainy seasons, with a subsequent fall during the dry season¹¹

Research currently identifies the factors that decrease likelihood of diarrhoeal disease in developing countries as: the distance away from a clean water source, access to a latrine, a higher number of siblings, and knowledge of food hygiene.¹¹ Low birth weight, malnutrition and breast feeding were found to have no correlation with incidences of diarrhoea.¹¹

Other research has also found that hygiene education amongst mothers has reduced morbidity from diarrhoeal disease.¹¹ Although this research was undertaken in Zaire and may not incorporate the barriers to health unique to Tanzania, educational intervention in the area of food hygiene could result in decreased morbidity from diarrhoeal disease.¹¹

B) Prevalent problems in the Morogoro region.

In addition to the conditions listed above, there are also unique health problems within each specific region. Research has shown that in the Morogoro region, although the conditions above are the greatest contributors to mortality, there are also compounding factors which are extremely prevalent. The problems listed above still remain the biggest killers within the Morogoro region, however the problems listed below are especially prevalent in the Morogoro region, to include Kisaki village

Nutritional Status during Pregnancy

A recent study on adolescent pregnancy in the Morogoro region found that 85.5% of all pregnant teenage girls are anaemic, with 55% having lower Haemoglobin concentrations than normal.¹² At time of birth, 54% of women were reported to be under 151 cm, with 27% reported to have muscle wasting.¹² Anaemia in these instances were thought to have been caused by inadequate intake of iron-rich foods, worm infestation, and Malaria.¹² There is a strong correlation between anaemia, low haemoglobin levels and low birth weight, which of course gives rise to other complications for the neonate and the mother.¹² Height below 151cm gives rise to increased complications during labour.¹² As discussed earlier, education has been show to be the most influential factor contributing to maternal and infant mortality. 98.9% of women in the Morogoro region have undergone primary education only. This does not include any sexual health education or education about pregnancy.¹² It is very likely that with adequate education, especially concerning care during pregnancy, nutritional status of pregnant mothers and hence mortality can improve.

Oral Health

Previous studies amongst primary school children (ages 7 -13) have shown that around 25% of have at least one dental cavity.¹³ Levels of gingival bleeding are estimated at 10% and calculus 12%.¹³ The report also highlights that over 90% of children in this region own a modern toothbrush, however some children use ash or charcoal instead of fluoride toothpaste.¹³ Although the sugar consumption in the area was low, many children valued eating sugary snacks.¹³ Although oral health may not seem like a priority, poor oral hygiene can consequently cause many medical complications, e.g. abscesses, and easy routes of infection.¹³ It is evident that more education is needed in terms of oral hygiene for children to cement good hygiene practises, to include knowledge surrounding the causes and consequences of oral disease.¹³

C) Public Health specific to Kisaki Village and Ranger camp.

Below are the specific medical conditions / incidences I have personally noticed in this area in terms of public health. It must be noted that exact diagnoses are unknown due to a lack of diagnostic facilities. Increased research should be undertaken in these areas in the future when access to diagnostic equipment is available.

Measles

Although there is a free MMR vaccine programme running in Kisaki and the surrounding areas, around 10% of presentations to the dispensary were children suffering from Measles. On further questioning, they had mother had missed the vaccine, due to not knowing the purpose of it.

African Trypanosomiasis

Due to the large numbers of Tsetse flies within Selous Game reserve, many people consequently suffer from African Trypanosomiasis (sleeping sickness). This disease can be fatal, however can be treated relatively easy if found early. Due to the nature of the initial symptoms, many people do not choose to seek medical attention as the symptoms can be very mild. Although currently preventative strategies are in place to control numbers of Tsetse fly in the game reserve, educating the community with regard to the signs and symptoms of this disease can only help to reduce morbidity.

According to the medical staff at the dispensary, hookworms were an extremely common problem in Kisaki. This is due to the spread of hookworm eggs through dirt, poor sanitation practise and lack of facilities. Although in many people hookworm can lie dormant without producing any symptomology, consequences of harbouring hookworm can be fatal. For example, having hookworm as a pregnant mother can lead to anaemia and low infant birth weight, which can result in death.¹² Other consequences are protein deficiency, severe vomiting, diarrhoea and cardiac failure.¹² Again education should include the early signs of hookworm infestation as well as the importance of being checked for hookworm in pregnancy.

D) Current Barriers to Health in Kisaki Village

Sociological Barriers to Health in Kisaki

- Gender Inequality

78% of women are reported to be unemployed in the Morogoro region, with a staggering 98.8% having primary level education only.¹⁴ This figure is a lot higher than with men, despite the cost of secondary education being the same for both males and females.¹⁴ This also indicates a great lack in education for women, consequently contributing to maternal and infant mortality.

The general attitude towards gender role is that the man has the more decisive and financial role, where the women have more of a homemaking and motherly role. Gender inequality in Tanzania is a major problem, with 90% of women completely financially dependent upon their husbands.¹⁴ This is a great problem for women who have health problems they are unwilling to discuss with their husbands, as they are then unable to access the finance for medication. It also means that women have a less influential and decisive role in terms of STI testing and contraception use.

- Attitudes towards Western Medicine.

Through talking with many women, the general attitude towards contraceptive pills and other forms of contraception such as the injection, and the implant, are that they cause infertility. Some women also reported that they thought it was a way of the 'white man keeping black numbers down,' or thought that by using it, it would cause cancer. Attitudes towards condoms however were very accepting, despite many not knowing how to use them. Information given regarding health in pregnancy and infant health were especially well received. Attitudes toward western medicine were also very accepting, especially in regards to curing symptomology. In fact, even some Masai report refraining from teaching their young traditional medicine due to increasing popularity for Western Medicine and the clinic.

- Sexual Stigma

Many do not believe in sex before marriage in Tanzania, an attitude that transcends through government levels, resulting in NGO programmes providing free contraception only for the married.¹⁵ The general stigma surrounding sex prevents people seeking help for symptoms of STI's.¹⁶ This stigma also stops people discussing their knowledge of these diseases, resulting in a community that has very poor knowledge of the consequences of unprotected sex. Not one person I had talked to had ever heard of Chlamydia and therefore obviously did not know it led to infertility. Women used to have tribal initiation ceremonies where the elders would discuss sexual

issues; however, this tradition is dying out, with no replacement. This again highlights the need for greater education in terms of sexually transmitted infection.¹⁷

Environmental Barriers to Health

Unfortunately most of the environmental barriers to health in Kisaki are extremely hard to change, for example: numbers of Tsetse flies and mosquitoes. The food available to the community of Kisaki is also fairly limited, with diets consisting of mainly beans and vegetables, and far less meat than the typical Western Diet. This could also be a contributing factor to rates of anaemia and low birth weight.

Economical Barriers to Health in Kisaki

Kisaki village is predominantly a tourist and agricultural village. Much of the income is from nearby camps offering tourist visits to Selous Game reserve. In addition to this, many rangers from the nearby ranger post visit Kisaki on holidays and days off. Due to the nature of business in the village, it is reported that many prostitutes travel to Kisaki village in seasons where work elsewhere is scarce. This indicates that there is perhaps even greater need in Kisaki village for sexual health education than other parts of Tanzania.

Due to the tourist nature of the village, cost of living in Kisaki is reported to be high in comparison to other rural villages. This includes the cost of medication. Therefore it is imperative that interventions are put into place to improve financial accessibility medication and healthcare. From a curative perspective, the lack of resources and current level of the clinic/dispensary is also a major barrier to good health. This is discussed in more detail below.

3. Kisaki Clinic Service Evaluation

Currently health institutions in Tanzania are classified into four different groups. Regional hospitals, district hospitals, health centres and dispensaries.¹⁸ Each sub group has a criteria in terms of the medicine it should stock and the level of healthcare that should be accessible.¹⁸ These criteria are reviewed by the World Health organisation as well as the United Republic of Tanzania's Ministry of Health, however at the lower levels of healthcare, specifically health centres and dispensaries there is no evidence of audits taking place to maintain standards. It is therefore imperative that annual service evaluations and audits are conducted of clinics and dispensaries (*by organisations such as Doctors on Safari*) to improve current standards.

Kisaki clinic is a small government run organisation that is of dispensary status according to the United Republic of Tanzania's Ministry of health. Its objective is to supply the most basic of healthcare to around 10,000 patients a year. Currently its cost to patients is 5000TSH annually, which includes an unlimited number of consultations and medications that are needed. Alternatively, patients can pay 1000TSH per individual consultation. Healthcare to children under 5 and pregnancy mothers is free. Opening hours are 0800-1400 Monday to Friday; however the dispensary closes in the absence of patients.

Human Resources

Currently the dispensary employs one full time doctor and one full time nurse. The Doctor's role is to examine, diagnose and prescribe medication, as well as answer emergency calls for the village. The nurse's role is to aid with diagnosis, clean the dispensary every morning, fetch water for the clinic, and to take the place of the doctor whilst away.

The doctor appeared adequately trained for his role in terms of knowledge of disease. This was surprising as he had only 2 years training at a medical school, and was awarded a diploma rather than a degree (which would not be recognised in the UK as a medical qualification).

Unfortunately, attendance of the doctor is a major problem to the clinic with him reported being absent for around one quarter of every year. This is due to trips to the nearest town to apply for funding for medication, leaving the nurse as the sole employee in the hospital. The current training of the nurse is completely inadequate in terms of medical knowledge to carry out the role of a doctor, especially in terms of prescribing. Many of the drugs she prescribed seem completely random, as they did not correlate to the symptoms the patients were experiencing. On a positive note, the Tanzanian medical education system allows a nurse to train for an extra year to gain a medical diploma, creating an opportunity for a trained nurse to gain the same competencies as the doctor.

With the dispensary providing medical care for over 10,000 per year, increased human resources are of paramount importance to improve the current state of the clinic. The work demanded from the nurse each day is far too much for one person. This is reflected in the poor standards of hygiene in the clinic. There is also no outreach work, and not enough staff to be called for home births and community education.

Medication

The medication the dispensary had in stock at the time of visiting were as follows:

- Phenytoin
- Chlorpromazine
- Praziquantel
- Magnesium Sulphate
- Hyoscine Butylbromide
- Albendazole
- Vitamin A Complex
- Folic Acid
- Chloramphenicol
- Zinc Sulphate

This was around 4% of the expected medication a dispensary is supposed to stock according to the World Health Organisation and Tanzanian Ministry of Health regulations.¹⁹

Currently the consultation fee of 1000 TSH supposedly includes the price of any treatment the patient may require of dispensary standard (e.g. only medicines listed in the URT MOH regulations for dispensaries should be free.) When the dispensary does not have the relevant medication, patients choose not to attend, as they will have to pay the 1000TSH plus the extra money to get the relevant medicine from a private pharmacy. This highlights that this is the dominate problem within the clinic, and without sufficient medicine, there will be no patients, therefore all other resources at the clinic are wasted.

Equipment

Currently, the list of the equipment in the dispensary is as follows:

- 3 beds (in disrepair)
- 2 pairs of stirrups (for labour and obstetric examinations)
- 1 stethoscope
- 1 thermometer
- HIV testing kits

As seen above, it is obvious that the dispensary does not even have the basic equipment required to run effectively. Most diagnoses are purely derived through patient history, without any diagnostic tests being performed. This results in many antibiotics and anti-malarials being prescribed without a positive diagnosis, encouraging the growth of new resistant strains of disease.

Facilities

- *Water*

There is currently no running water supplying the clinic. The nearest well is only a 10 minute walk away; however, often the nurse will have to queue with the other villagers, resulting in trips to fetch water lasting on average half an hour. In times when the doctor is fetching medication, this leaves the clinic completely unattended and increases patient waiting times.

- *Gas/Electricity*

Currently there is no electricity supply to the dispensary. Although there is a refrigerator which is normally used to store vaccinations and other medication that require low temperatures for the most part of each year the clinic cannot afford to supply the gas to run it. At the time of evaluation, the fridge was completely empty, as was the gas cylinder, and so no refrigerated medication was available.

Sanitation/Hygiene

The levels of hygiene and cleanliness in the dispensary were very low. As stated above, due to lack of staff, children often urinated inside the diagnosis rooms of the clinic without the nurse attempting at any point to clean it up. This was due to difficult access to water and the demands on the nurse, again highlighting the need for increased human resources in the clinic. Although the nurse used gloves when testing for HIV, at no other point did the doctor or nurse use alcohol gel or gloves during examinations as supply of both were scarce.

Health and Safety

An advantage of this clinic is that there is an effective sharps protocol in place. Sharps and other clinical waste are placed in heavy duty boxes which are then burnt in a designated place at the back of the clinic, within a metal container to keep the area safe from children. However the clinic could improve its health and safety protocol by

repairing many of the doors, as many looked like they were about to fall on patients. Again increased human resources are required to clean up spills to prevent falls and injuries.

It is obvious from the service evaluation above that Kisaki dispensary is not meeting standards set by WHO and The URT Ministry of Health for an institution of dispensary status, and therefore is unable at present to provide the most basic healthcare to the community. Although there are alternatives to the dispensary in the area, they are more costly and therefore financially inaccessible to the majority of the community.

Recommendations for Kisaki Dispensary.

In its current state, the list of recommendations for Kisaki dispensary would be endless. To reach the targets set by the WHO and the URT MOH currently, is entirely unrealistic due to financial restraints, however, the short term improvements I feel are both financially realistic and provide the greatest benefit to the community are listed below.

Primary Objectives

a) Supply of medication.

Financially, it is unrealistic to aim to provide all of the medication as set out by WHO and the URT MOH for a health institution of this status. Therefore I believe the objective should be to provide only the top 20 medications in demand, through a subsidized medication scheme where the patient pays a small fee to receive the medication required. The top twenty medicines are listed along with costs under figure 5 (Appendix A) and total an annual cost of £1407.24 after deducting community contributions which are estimated at £400 per year. (Prices were obtained from The Medical Stores Department, which is the supplier for many NGO and Government hospitals in Tanzania.) The benefits of a subsidised medicine scheme are that it will be much more sustainable in the long term than covering the entire cost of medicine, and will also promote a an attitude of responsibility for one's own health amongst the villagers.. The idea is that a new nurse which Doctors on Safari could fund (see below) can provide the medication from one of the empty rooms within the clinic.

With a universal fee of 500TSH per medication needed on one occasion (only with a prescription from the doctor), a minimum of £400 per year can be raised by the community to contribute to investment from Doctors on Safari. This allows more medication to be made accessible to the poorest of people. 500TSH appears a realistic figure for most families that on average only earn \$1 per day.

Suppliers

Currently, all health institutions in Tanzania receive their medication from The Medical Stores Department in Dar es Salaam which from a number of reviews, seems to be the cheapest source of medication in Tanzania, as it supplies government and NGO institutions. However, in order to buy medication at these baseline rates, the facility or organisation needs to be approved by the Ministry of Health. As Kisaki dispensary is a government facility, the doctor there is able to sign the relevant paperwork to give us access to these resources. Alternatively, correspondence will need to be instigated with the Ministry of Health to outline our intentions in order to gain approval for this project.

Further research is needed to examine the prices of certain medication from the private pharmacy before deciding how to price medications in this scheme. Also, pricing for transport costs and more information surrounding accessibility to the Medical Supplies Department is needed before implementing this scheme. Adjustments need to be made after further research is conducted to create a cost effective scheme. Alternatively, a pilot scheme should be implemented followed by review to create a sustainable and affordable system.

It cannot be stressed more that access to medication is the fundamental factor in improving this clinic. Without this foundation, investment into other areas of the dispensary is likely to be wasted, as no patients will attend for treatment.

b) Employment of nurses

Employing two new nurses for the dispensary would be an extremely cost effective way of benefiting patients and the wider community. At present there is not enough staff to cater for the number of patients attending the dispensary. However, I believe that by employing two new nurses to not only work within the clinic but to educate the community and attend births, community health of Kisaki could improve drastically.

The roles of the newly employed nurses would be as follows;

- To provide access to subsidised medication
- To attend home births (Research has shown the attendance of a healthcare professional during labour radically decreases maternal and infant mortality)
- To provide educational classes for the community (Please see Recommended Preventative interventions for more detail)
- To maintain standards of hygiene in the clinic
- To support the existing nurse in her job role when required.

Amongst speaking with the nurse and prospective employee's, a wage of £10 per week per nurse has been found to be extremely reasonable. Two nurses would cost per annum £1040, a figure which is not unrealistic for Doctor's on Safari to raise.

c) Purchase of a microscope

Purchase of a microscope is essential to this clinic for diagnosis of Malaria, and other parasitic disease which is extremely common in this area.

Through discussion with a number of microscope companies, the specification needed for a microscope of diagnostic quality (incorporating the fact that there is no electricity is available) is a basic monocular microscope with magnification of at least x500 up to around x 1000. The cost of this standard of microscope is typically £240 in the UK. Second hand microscopes are not recommended as there are often pieces missing. In addition to the microscope, there are other essential accessories needed for maintenance and diagnosis of certain disease. Please see cost list A (Figure 5 Appendix A)

At present as there is no microscope, all patients presenting with a fever are told to purchase anti-malarial from the local pharmacy. This means many patients are spending money on medication that may not be needed. IN addition to this, excessive use of anti-malarials promotes production of resistant strains of malaria.

In the future this could cause great problems as would mean that many of the drugs used currently to treat Malaria will no longer be effective.

d) *Doctor/Nurses relocation into newly built staff house*

Pressure should be placed on the local government for the doctor to move into the existing house that Tent for a View have built for the dispensary. Currently, there is no known reason why this has not occurred yet. If this does not happen in the near future, perhaps this house can act as accommodation for the two new nurses. Relocation of health care professionals into this house provides a place for people to go in case of Emergency situations.

e) *Other equipment*

A *sphygmometer* is the most basic of equipment costing only 62,000 TSH or £26.00. The dispensary would really benefit from this as it would be able to conduct general observations of patients in regards to blood pressure. This is especially important to monitor in pregnancy due to risk of pre-eclampsia.

A set of decent weighing scales costs roughly around £20.00 and would also be of extreme benefit to the clinic.

This equipment is extremely to acquire in the UK, and it should be put to the attention of future elective students to bring certain supplies and equipment.

The Full cost list for the Primary recommendations for Kisaki dispensary can be found in the Appendix A and totals to £2704.24. I feel this target would be achievable for Doctors on safari to raise within the first year. Money should be raised via contributions from tourists as well as contributions from medical students within the UK. Finance will be discussed in more detail in part 6.

Secondary Objectives

a) *Placing pressure on local government for the construction of water facilities.*

As Tent with a View contributes money to the local village government, pressure should be placed on them to build a well for the local clinic. Quotations for a price of a well from a local specialist in this area to include materials are listed in Figure 7 (Appendix A). As the company pays much more than the total cost for a well per annum, it has to be questioned what the village committee is spending their money on. These figures may help to place pressure on them.

b) *Other important medications.*

The second top 20 medications are listed in Figure 6 in Appendix A and total £565.04 per annum to include estimated deductions from community contributions of £400. If excess funding is secured, this should be the next objective in order to provide Kisaki and surrounding villages with as much access to medication as possible. Again the proposed idea is a subsidised medicine scheme as explained earlier.

5. Recommended preventative interventions

Education

Through education for women, children and the wider community, people are able to make more informed decisions regarding their own health. Maternal and Infant mortality has shown to decrease in the presence of health education due to knowledge about the mechanisms of labour, and information regarding maternal nutrition. Levels of diarrhoeal disease, sexually transmitted infection and oral health have also found to decrease after affective health education initiatives have been implemented.

Health education meetings can be held that can be run by one of the two nurses that could be employed by the Doctor's on Safari programme. The suggested topics as listed below were chosen as a result of research outlining the effectiveness of education amongst certain areas of health, as well as their effectiveness and need within Kisaki village.

Education for women

. Through employment of two new nurses through the Doctor's on Safari programme, a women's group can be run to educate women on the following topics.

- *Childbirth/Labour*
- *Care during pregnancy,*
- *child and adult nutrition,*
- *Abortion*
- *Sexually transmitted disease and infection,*
- *Contraception,*
- *Female Hygiene,*
- *Prevention of infectious disease,*
- *Childcare (recognising early warning signs of potentially life threatening disease)*
- *Importance of immunisation*
- *Basic health education to include recognising signs of specific disease, e.g. meningitis, measles and other childhood killers.*

As well as acting as an educational resource for women of the village, the group will also act as way of empowerment for women, and will provide a confidential service for women to come and discuss problems that may be present in their lives at the current time (e.g. abuse) By informing women of consequences of health choices and by offering support for psychological distress, we will hopefully see an improvement of quality of life for women in this area.

Education for children

The nurses can also visit the local primary school to promote oral health, disease and symptomology awareness and hygiene practises to prevent infectious disease.

Education for the general community

The topics to address whilst educating the community are as follow:

- *Recognising early signs of disease*
- *Disease prevention*
- *Contraception*

In addition to this, future elective students may wish to run First Aid classes for people in the village.

It must be noted that to overcome attitudes towards Western Medicine, teaching of the topics above must act only as a way to provide information to the villagers. The premise of this education should not be to force the community to act in particular ways nor to force western medicine upon them, but to act as a source of information. In this way, better choices can be made and quality of life can improve through reaching desired health outcomes by more informed decision making.

These groups can also act as an indirect way of informing the community how much Tent with a View contribute each year, and so hopefully will put pressure on the local government to build a well from the people of the village itself.

Reducing sexual stigma campaign

Displaying sexual health posters within the clinic and other public areas will reduce the stigma caused by talking about sexual issues, and will hopefully act as a discussion point to enable villagers to talk more freely about their knowledge of sexual health.

Improving Healthcare-Patient relationships

Other studies have found that the key factors deterring attendance to clinics regarding sexually transmitted infections are

- *The fear of being judged by the healthcare professional (reported to be high in Tanzania due to cultural stigma)*
- *The fear of consultations not being confidential*

It is therefore of paramount importance to bring these issues to the attention of healthcare professionals, in regards to how their interpersonal skills can affect health outcomes. Although the healthcare professionals may not take these points on board, knowledge of these factors can only highlight the importance of being non-judgemental and accepting of young pregnancy and sexually transmitted diseases.

The Need for Further Research

Further research is need in the epidemiology of disease in this region to be able to manipulate interventions accordingly. Increased record keeping within the clinic is required in regards to presentation of symptoms, as well as qualitative research to monitor community barriers to accessing healthcare. As discussed below, the need for further research could be satisfied by medical students, who are allowed to undertake a research project in their fourth year and who could also financially contribute towards the dispensary.

6. Recommendations for The Doctors on Safari Programme.

Cost of elective.

The cost of elective for future students should be priced at £1000 per 8 week placement. This figure is much lower than companies specializing in Elective placements, which currently costs on average £2700 per 8 week placement in rural Tanzania.

Number of students

Sable mountain lodge should aim for at least 2 elective students per year, averaging an income for the project of £2000, in addition to this however, further funds should be made from donations and from allowing one research student to stay at the lodge.

Student Gender.

It is important that both a male and female medical student are placed at Sable mountain lodge. Due to the culture, it seems many women here feel much more comfortable talking to another woman in regards to women's health problems and childbirth. As many of the Doctors in Tanzania are men, I feel it is imperative to allow women the opportunity to talk with a female medical student about issues that would otherwise be uncovered. This recommendation was also backed by general feedback from the women's health talk at the Ranger camp (where they requested that no men were present)

Equipment list

An equipment list should be sent out to all future elective students so that they are able to get second hand equipment from the UK to take to Kisaki. For 2012, this list is as follows

- Sphygmometer
- Thermometer
- Weighing scales
- Disposable gloves
- Suture packs
- Bandages.
- Pregnancy tests
- Urine dipsticks

Opportunities for other finance

Research Students

As all medical students have to undertake a research project in their fourth year, and are able to do this abroad, advertising the Kisaki area as a place to conduct research would:

- Put the needs of this area on 'the map' for other health care professionals. (Medical students have to present their project to consultants and many projects end up getting published in medical journals and magazines.)

- Raise more money for the project, if a charge of again £1000 per 8 week stay was implemented
- Increase our knowledge of the epidemiology of the area
- Give us more information in terms of need.
- Give us more evidence if we were to lobby in regards to particular issues (death via abortion)
- Give potential investors hard statistical evidence specific to the area that could aid their decision to invest in the project.

Online donations

A link to a website that would allow customers and others interested in the project to donate online would also be extremely beneficial, especially if plans with the clinic and more information about Doctor's on Safari were made available online. As the project is relatively small, it is much easier to keep everything transparent, encouraging people to donate more money as they know exactly what the money will be used for.

Donation box at Sable Mountain Lodge

Whilst at Sable, I found some customers who wanted to donate money to the project but did not know how, meaning in the end no money was exchanged. There needs to be a simple and effective way in which tourists can donate towards the scheme. I suggest a donations box that can perhaps be placed in the bar area.

7. Conclusion

To improve the health of community, efforts should be applied in a holistic way. Although the recommendations above do not necessarily focus purely on the treatment of disease, it is imperative that they are carried out as to reduce morbidity and mortality from a both a preventative and curative approach. Through small projects such as those run by Doctors on Safari, needs can be identified for specific regions in Tanzania, meaning investment into recommendations are more likely to be cost effective in terms of improving health. Around £3000 needs to be raised in the next year in order to meet primary objectives which will hopefully make a relatively big impact in Kisaki health.

As with any sustainable development, The Doctors on Safari programme is beneficial to all involved: the community, the company and medical students. The small scale on which this Doctor's on Safari project is run is easily replicable amongst other tourist operators and private companies throughout Africa. Through increasing awareness of health problems in somewhere such as Kisaki, medical students can not only improve the Kisaki area but bring a different perspective to medicine in the United Kingdom.

Appendix A

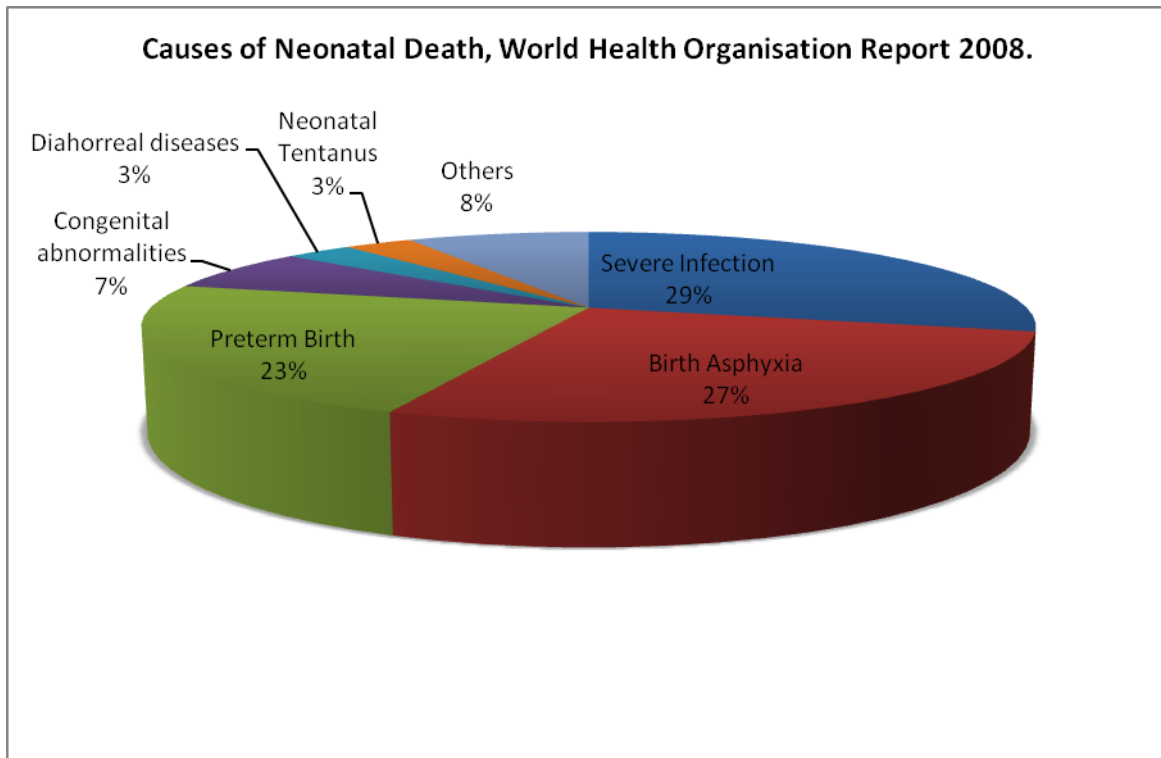


Figure 1: Causes of Neonatal Death, World Health Organisation Report 2008⁴.

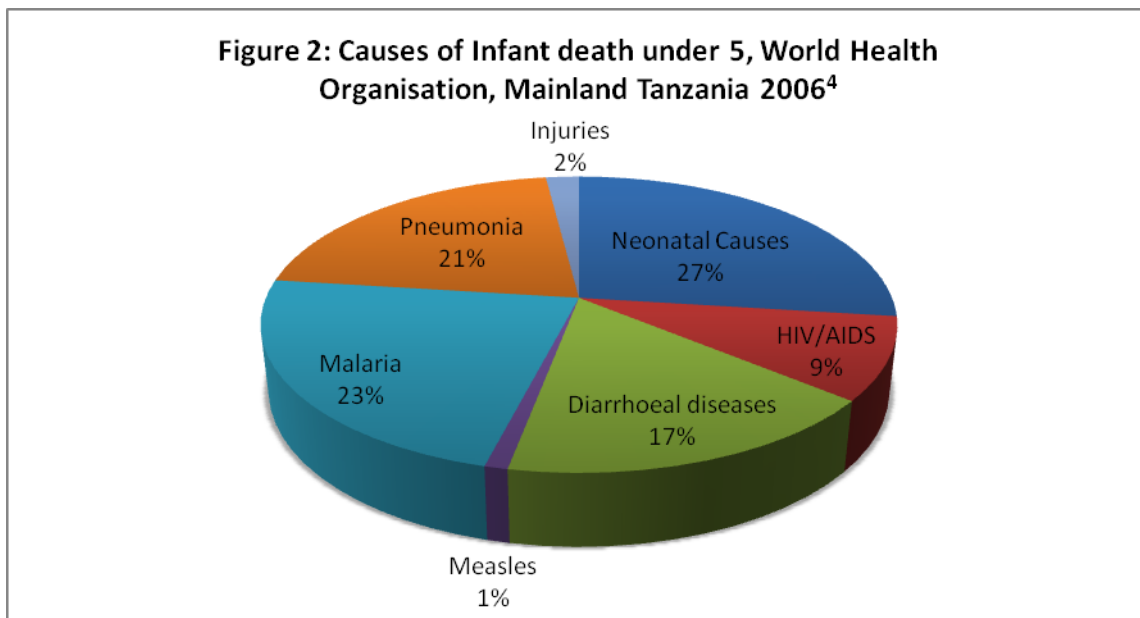


Figure 2: Causes of Infant death under 5, World Health Organization, Mainland Tanzania 2006⁴

Under 5 mortality for highest and lowest quintiles. United Republic of Tanzania, DHS 2006			
Wealth	Lowest	Highest	Ratio
	160	135	1.2
Sex if child	Males	Females	Ratio
	172	150	1.1
Urban/Rural	Rural	Urban	Ratio
	166	142	1.2
Mother's education quintiles	None	Higher	Ratio
	165	63	2.6

Figure 3: Under 5 Mortality for Highest and Lowest Quintiles. United Republic of Tanzania. DHS 2006 ⁴

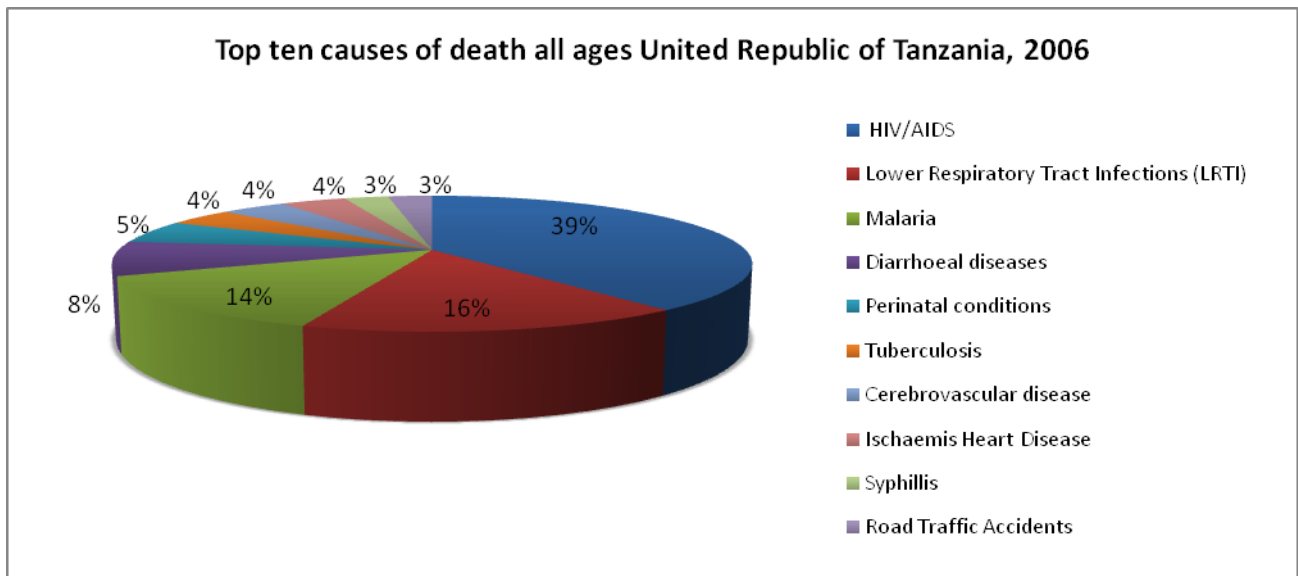


Figure 4. Top ten causes of Death in all ages. United Republic of Tanzania 2006 ⁴

Fig 5: Cost List A (Primary Objectives)

1. Top 20 Medications required per 3 months							
Name of Drug	Quantity of tabs/ caps per unit	Dosage	Quantity per 3/12 (units)	Price per Unit	Total Amount in TSH	Total amount GBP	
Tabs Paracetamol	1000	500mg	10	6900	69000	£25.16	
Caps Amoxicillin	1000	250mg	6	30000	180000	£65.63	
Tabs Phenoxymethyl Penicillin	1000	250mg	6	24000	144000	£52.50	
Tabs Cotrimoxazole	1000	400mg	6	15000	90000	£32.81	
Tabs Hyoscine N Butylbromide	500	10mg	4	17000	68000	£24.79	
Tabs Erythromycin	1000	250mg	3	32000	96000	£35.00	
Tabs Metronidazole	1000	200mg	5	6000	30000	£10.94	
Tabs Diclofenac	100	50mg	20	700	14000	£5.10	
Caps Cloxacillin	1000	250mg	2	32000	64000	£23.33	
Tabs Ciprofloxacin	100	500mg	10	5000	50000	£18.23	
Tabs ferrous Sulphate	1000	200mg	5	53000	26500	£9.66	
tabs Chlorpheniramine	1000	4mg	4	1200	4800	£1.75	
Tabs Quinine Sulphate	1000	300mg	2	69000	138000	£50.31	
Sulphadoxine and Oyrimethamine	25	500mg	2	14000	28000	£10.21	
Omeprazole	100	20mg	10	1700	17000	£6.20	
Amoxicillin Granules	24	125mg	4	15000	60000	£21.88	
Cotrimoxazole suspension	24	200mg	4	12000	48000	£17.50	
Procaine Penicillin fortified		4MU	3	16000	48000	£17.50	
Benzyl Penicillin	50	5MU	3	15000	45000	£16.41	
Clotrimoxazole Cream	24	20 mg 1%	4	6100	24400	£8.90	
				Total Quarterly price	1244700	£453.81	
				Total annual price	4978800	£1,807.24	
				Minus community contributions	-£400.00		
				Total Cost to Doctors on Safari per annum		£1407.24	
2. Employment of Nursing Staff							
	2 x £520 per annum (£10 per week)						
				Total cost to Doctors on Safari		£1040.00	
3. Microscope Accessories							
Monocular microscope with mirror x 500 magnification					658276	£240	
25 mg Oil			1		5000	£1.82	
50 mg Methyl Blue			1		5000	£1.82	
25 mg Neutral Red			1		11000	£4.01	
Slides x 50			100		206	20600	£7.51
Pipettes x 20			1		1	2200	£0.80
Cover slips x 100			3		1000	3000	£1.09
				Total cost	705076	£257.00	
				Total Cost to Doctors on Safari		£257.00	
Overall Cost for Prioritised Recommendations:							
£2,704.24							

Fig. 6

Cost list B

(Secondary Objectives)

Other high priority medications.				
Name of Drug	Quantity per 3/12 (units)	Price per Unit	Total Amount in TSH	Price GBP
Povidine Iodine 10% 80In 250mls	6	1300	7800	£2.84
Artemether/Lumefantrine 20/120MG 180T Pack of 30	6	15000	90000	£32.81
Artemether/Lumefantrine 20/120mg 360T Pack of 30	6	15000	90000	£32.81
Artemether/Lumefantrine 20/120MG 720T Pack of 30	6	15000	90000	£32.81
Artemether/Lumefantrine 20/120MG 540T Pack of 30	6	15000	90000	£32.81
Ceftriazone Powder Injection 250mg 20 vials	3	10500	31500	£11.48
Promethazine tabs 25mg Tin of 1000	3	5000	15000	£5.47
Phenoxyethyl penicillin syrup 125mg/5ml (100mls x 24)	2	15000	30000	£10.94
Calamine lotion cream (100ml x 24)	2	5600	11200	£4.08
Benzyl Penicillin Emulsion 25% w/v (100mls x 12)	3	8300	24900	£9.08
Propranolol 40mg Tin of 500	2	14000	28000	£10.21
Chloroamphenicol 250mg tin of 1000	1	27000	27000	£9.84
Acetylsalicylic acid (aspirin) 300mg Tin of 1000	4	3200	12800	£4.67
Oxytetracycline Eye ointment	20	800	16000	£5.83
Aminophylline tabs 100mg Tin of 1000	2	4900	9800	£3.57
Epinephrine Injection mg/ml 10 vials	3	3200	9600	£3.50
Ephedrine 30 mg. Tin of 1000	3	5400	16200	£5.91
Phenobarbital 100mg Tin of 1000	2	9200	18400	£6.71
ORS Sachets 100 packets	3	9200	27600	£10.06
Lignocaine 2% 10 x 50mls	1	16000	16000	£5.83
		Total 3/12:	661800	£241.26
		Total Annual Price		£965.04
		Minus community Contributions		- £400.00
Total Cost to Doctors on Safari £565.04				

Fig 7.

Price List for Well

(To show Local Government)

Materials/labour	Quantity	Price per Unit	Price (TSH)	Price (GBP)
Labour			4800000	£1,667
Cement	53	16000	848000	£353
12mm Metal Pipes	16	20000	320000	£133
Sand	400	500	200000	£84
Chippings	500	1000	500000	£209
Oil			28000	£10
Binding Wire			28000	£10
Empty Plastic Buckets	6	3000	18000	£6
	Total		6742000	£2,472

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