

A Mining Health Initiative case study:

Kenmare Resources PLC and its health initiative in
Northern Mozambique:

Lessons in Partnership and Process

January 2013

FUNDING

The Mining Health Initiative is grateful to the following organisations and foundations for the financial support that made this project and this case study possible.



CONSORTIUM

The Mining Health Initiative is implemented by a consortium comprising the following organisations and institutions.



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ACRONYMS

ANC	Antenatal care
ARI	Acute respiratory infection
CHW	Community health worker
DHS	District Health Service
DHT	District Health Team
HANSHEP	Harnessing non-state actors for better health of the poor
HIV	Human immunodeficiency virus
I-SOS	International SOS
IPTp	Intermittent preventative treatment in pregnancy
IRS	Indoor Residual Spraying
KMAD	Kenmare Moma Development Association
LLIN	Long-lasting Insecticidal Net
MDG	Millennium Development Goal
MMR	Maternal Mortality Rate
MoH	Ministry of Health
MOU	Memorandum of Understanding
NGO	Non Governmental Organisation
NHS	National Health Service
PPP	Public-Private Partnership
PSI	Population Services International
RDT	Rapid diagnostic test
SEDE	Health and Development in the Workplace
STI	Sexually Transmitted Infection
TB	Tuberculosis
TBA	Traditional birth attendant

EXECUTIVE SUMMARY

Kenmare Resources plc is an international mining company whose primary activity is the operation of the Moma Titanium Minerals Mine in northern Mozambique. The company has been active in Mozambique since the mid-1980s, conducted feasibility studies on the Moma mine area in 2001, commenced construction of the mine in 2004, and turned its first profit in 2011.

Kenmare contracts service providers directly to ensure quality preventative and curative care is available to its workforce. International SOS (I-SOS) provides health services to Kenmare employees and contractors through a health centre at the Kenmare accommodation site. Medical evacuation is provided when necessary to South Africa. Employees also receive 2 long-lasting insecticidal nets (LLINs) per year and 1 can of insect repellent per month. Population Services International (PSI) have recently been contracted to provide HIV education and prevention services to employees. Kenmare conducts indoor residual spraying (IRS) within the Kenmare accommodation site. These employee services benefit an average monthly workforce of around 1,700 at an annual cost of approximately US\$880,980 or US\$513 per employee per year.

For the community in the locality immediately adjacent to the mine, called Topuito, Kenmare includes a health component within its wider social responsibility programme that also supports a well-developed livelihoods programme. Activities are run by sub-contractors which are managed by either Kenmare directly or, as is more often the case, by the not-for-profit independent organisation, Kenmare Moma Development Association (KMAD). Health services of the programme include: fortnightly medical and dental clinics at five Ministry of Health (MoH) health centres in Moma district; a new health centre currently under construction, which will become a formal MoH health centre and the only one in Topuito locality; community-based HIV awareness and prevention programming and IRS for malaria prevention. While good population data are unavailable, a best approximate cost of per person benefitting, given that all locality residents benefit in some way, is calculated at 20,152 people benefitting at an annual cost of US\$16 per person.¹

The case study is unable to explore the direct impact of the programme on the health status of those benefitting given a lack of data on the health of the communities or a sufficiently long period of data on the workforce. Kenmare plans to improve this data collection.

Strategic lessons can be drawn from the success the company has had in building partnerships:

1. The conception and design process should and can be responsive, balance community and company needs and promote sustainability

- Kenmare managed to achieve a balance in its programme design, recognising the need to respond to community and government priorities, yet also to address the likely health needs relevant to the company and assuming responsibility for the effects of the mine on surrounding areas.
- Kenmare deliberated carefully prior to finalising its health care programme, wanting to ensure sustainability of interventions through coordination and integration with the national

¹ Population figures for Topuito locality are calculated by the Moma District Administration

health system (NHS), and in consultation with communities. The new KMAD strategic plan has been an important opportunity to build on and clearly articulate this commitment to sustainability, though exit strategies remain to be defined in existing support and geographical areas. Scale-up needs also must be considered, taking advantage of the considerable lessons learned in the initial three years.

- Kenmare has prioritised strengthening the public health system with a view to the most likely route to sustainability. While they have prioritised the need for immediate impact on malaria above the need for sustainability - the IRS programme is not sustainable beyond Kenmare' support - they commit to continuing the IRS as needed as long as they remain operational in the area, which is expected to be in the long term.
- Attempting to build co-financing relationships with NGOs and fellow donors has shown some results. More may be shown in the medium term to be an effective way of widening the impact of the programme and improving sustainability of interventions.

2. Strong and effective partnerships can be built through careful fostering of relationships, clearly defined responsibilities and methods of holding partners to account

- In line with their desire for sustainability, Kenmare has forged a strong partnership with government at all levels from the outset. Including provincial and district health and administrative authorities from the planning stage, ensuring clear and mutually acceptable MOUs are in place and maintaining regularly contact shows how strong relationships can be built.

Useful lessons for best practice guidance can also be drawn from some of the gaps in Kenmare's approach:

1. Well thought through and designed monitoring and evaluation is important to support the case for rational and continued funding by the company or others.

- Collection of data on the relationship between workforce health and productivity, the health of the workforce and supported communities and the performance of cost-benefit analyses would be hugely valuable to Kenmare, KMAD, the NHS and the wider international health and development community.

2. Formal health impact assessments would add validity and assist in cost-benefit predictions.

- As a component of the strategic planning stage, would give robust information to allow rational decision making on the appropriate size of financial commitments to health interventions.

1. BACKGROUND AND PURPOSE OF THE CASE STUDY

The Mining Health Initiative has been commissioned by the ‘Harnessing non-state actors for better health of the poor’ (HANSHEP) group to build understanding of, and foster agreement on standards for, mining industry public-private partnerships (PPPs) which work to strengthen health services for underserved populations. The Mining Health Initiative will lead to enhanced understanding of on-going mining health PPPs and a set of good practice documentation of mining health programmes for wide dissemination and application.

The Mining Health Initiative had conducted a number of case studies of health programmes run by mining companies in sub-Saharan Africa. The purpose of the case studies is to document the reach and impact that has been achieved through such projects and examine the best ways in which these programmes can overcome practical challenges and achieve maximum effectiveness both in terms of costs and efficacy. The case studies have both descriptive and analytical components (Figure 1).

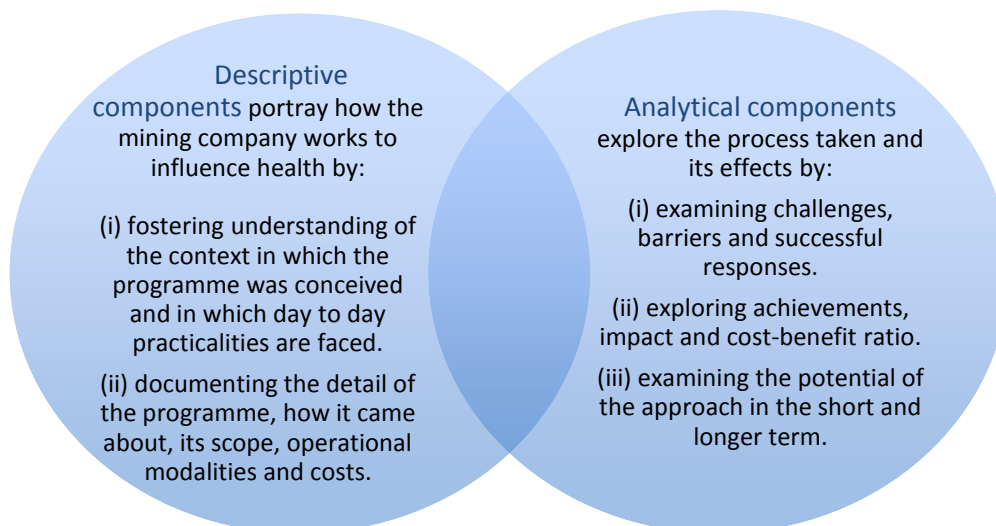


Figure 1. Objectives of the descriptive and analytical components of the case studies

There are a number of key audiences for the case studies with varying intended impacts:

- **The Mining Health Initiative and HANSHEP.** *Intended impact:* improved understanding of the scope, potential and most effective approaches for mining health PPPs; to inform the Mining Health Initiative’s Phase III.
- **The donor community.** *Intended impact:* increased awareness of the potential for mining health PPPs as approaches to improving the health of hard to reach populations.
- **The mining sector.** *Intended impact:* increased awareness of the range of potential approaches and the opportunities for increasing impact and cost-effectiveness.
- **Other health sector organisations.** *Intended impact:* increased awareness of the opportunities for mining PPPs and of how best such partnerships may work.

2. CASE STUDY METHODOLOGY

This case study was conducted by a team of two international public health experts. Data collection was undertaken through a i) review of documents, ii) review of health data national, local and company health centre, iii) key informant interviews with company and partner and iv) focus group discussions with community representatives. Details are shown in Annex A.

3. SITUATION ANALYSIS

3.1. Company profile

Kenmare Resources plc is a member of the FTSE 250 Index and has a primary listing on the London Stock Exchange and secondary listing on the Irish Stock Exchange. Kenmare operates the Moma Titanium Minerals Mine, located in Topuito locality, Moma District, Nampula Province, on the north eastern coast of Mozambique (Figure 2).

The mine contains reserves of heavy minerals, including titanium minerals ilmenite and rutile (used in the production of paint and plastics) and the relatively high-value zirconium silicate mineral, zircon (used in the production of ceramics and tiles). Annex B includes further details on the Kenmare mine production process.

Following feasibility studies in 2001 and subsequent negotiations with the Government of Mozambique, Phase I of mine construction began in August 2004. Low capital and operating expenses, due in part to a dedicated port facility immediately adjacent to the mine, have allowed Kenmare to progress rapidly to Phase II, a 50% expansion currently under construction. The expansion is expected to be commissioned in the last quarter of 2012, with expanded capacity coming online during 2013. Phase III pre-feasibility studies are underway. Given the size of the ore reserves and projected production following Phase II, Kenmare could mine in Moma for a further 160 years; no phase out of operations is currently under discussion.

In 2011, revenue from the mine was US\$167.5 million, with profit after tax of US\$23.7 million – Kenmare’s first profit on the mine. However, due to heavy investment and start-up costs, Kenmare carries extensive current and non-current liabilities.

There are considerable monthly fluctuations in staffing levels depending on the number of subcontractors employed. At the end of March 2012, Kenmare’s mine staffing levels stood at 1,037 employees, of which 898 were national staff and 139 international staff. A further 678 were employed by sub contractors, most of who are working on the mine expansion project. Small offices are maintained in Maputo (6 staff, including the country manager) and the provincial capital, Nampula (5 staff).

3.2. Demographic profile

Box 1 shows basic demographics (see Annex C for details).



Figure 2. Location of Kenmare Moma Titanium Minerals Mine

Population Figures :	
Mozambique National:	23.7m
Nampula province:	4.6m
Moma district:	348,101
Topuito locality:	20,152 ¹
<i>2012 extrapolations from 2007 census</i>	

National growth rate:	2.3%
National % urban-dwelling:	28% ²

¹Moma District Office; ²UNICEF Mozambique.

In Moma district, Macua is the predominant language. Portuguese is taught in schools, but only 7 per cent of women and 28 per cent of men speak it.

Illiteracy remains high, at 64.5 per cent of those aged 15 and older (95 per cent of women and 75 per cent of men).

Of the economically active population, 96 per cent are engaged in informal work or family farming, with only 4 per cent earning a salary. Women comprise only 4 per cent of this salary-earning figure.

Development status

Since peace was established in Mozambique in 1992, political stability and rapid economic growth (average growth rate of 8% over the last 15 years) have characterized Mozambique's development. Nevertheless Mozambique is ranked 184 out of 187 countries on the UNDP Human Development Index². Reductions in extreme poverty and hunger (Millennium Development Goal or MDG 1) are being achieved, with the proportion of Mozambicans living below the national poverty line dropping from 69 per cent in 1997 to 54.7 per cent in 2009³.

However, this is lower than the country's 2009 target in its poverty reduction strategy and may mean Mozambique is unlikely to reach the 2015 goal. As measured by the national poverty index, the level of food poverty is slightly below 55% of the population. Nampula province is in line with the national average with 54.7 per cent food poverty. Universal primary education (MDG 2) is unlikely to be achieved nationally⁴ and in the programme area in 2005 only 21 per cent of the district population was attending or has attended school.⁵



Figure 3. Typical rural house in Moma District

Transport access and community infrastructure

Moma district relies on the regional road links to the provincial capital and Angoche district, which are partly tarmac but have not been maintained. All other link roads in the district are non-classified, in very poor condition and not maintained.

A typical rural house (Figure 3) has a pounded earth floor, thatch roof and walls of reed or sticks and no electricity.

93.6 per cent of families in Moma district have no access to a latrine, and 74 per cent access water through open wells. Inequalities in access to basic social services are seen between urban and rural areas, by gender and socio-economic status. Women, children, the elderly, disabled and chronically-

² UNDP Human Development Indicators. <http://hdrstats.undp.org/en/countries/profiles/MOZ.html>. Accessed 3 May 2012.

³ Plano de acção para redução da pobreza (PARP) 2011-2014 – Government of Mozambique Poverty Reduction Strategy Paper; Maputo 3 May 2011. The national poverty line in Mozambique is 18 meticaís, or about US\$0.50, far lower than the MDG indicator of less than \$1.25/day.

⁴ UN Mozambique, 2008. <http://mz.one.un.org/eng/What-we-do/About-the-Millennium-Development-Goals/MDGs-in-Mozambique>

⁵ Perfil do Distrito de Moma, Província de Nampula, Ministério de Administração Estatal, República de Moçambique, Edição 2005

ill are most at risk.⁶

3.3. Health status

National and provincial level

Despite significant improvements since 2000 and 3.5 per cent of GDP spent on the NHS, health care in Mozambique remains highly inadequate. The health status of the population is lower than in other countries in the region. Maternal, neonatal, infant and child mortality rates remain high (Box 2). The maternal mortality (MMR) remains amongst the highest ratios in the world, at 500/100,000 and Mozambique is unlikely to meet the 2015 targets for MDG 5, improved maternal health. While Mozambique may achieve its target to halt and reduce the burden from HIV and malaria (MDG 5), it will not achieve MDG 4, reduced childhood mortality, without more substantive progress in malaria control.

According to national statistics, major causes of mortality include malaria, HIV, tuberculosis (nearly 30 per cent of TB-patients are co-infected with HIV), anaemia, sexually transmitted infections (STIs), intestinal parasites, acute respiratory infections (ARI) and malnutrition. Over a quarter of total deaths are attributed to malaria⁷ which also accounts for 48 per cent of total outpatient consultations. Nampula province has far lower HIV prevalence than the national average, at 4.6 per cent⁸.

In children under five, more than 80 per cent of deaths are caused by preventable infectious diseases - the four main causes are shown in Table 1. As well as being the primary cause of under-five mortality, malaria causes a massive burden of illness in this age group, with 68 per cent of hospital admissions in children under five due to malaria. Malnutrition also remains a concern, many children suffer or die due to low birth weight and one in five children under five (41 per cent) are underweight for their age or are chronically malnourished.⁹

Table 1. Main causes of under-five mortality at national and provincial level

Administrative Level	Diarrhoea	AIDS	Malaria	ARI
National	6.7	9.8	33.2	10.1
Nampula	8.0	9.5	33.8	8.1

Source: 2009 National Child Mortality Survey

⁶ PARP 2011-2014

⁷ MOH 2011

⁸ INSIDA survey preliminary report, Institute of Health, Ministry of Health 2009

⁹ Plano Estratégico Sector da Saúde 2007-2012 (PESS), Ministério da Saúde March 2008

The Ministry of Health has made significant effort to roll out measures for malaria prevention, including IRS, LLINs and intermittent preventative treatment for pregnant women (IPTp), diagnosis (rapid diagnostic tests or RDTs) and microscopy) and treatment. Good progress is also being made in immunization coverage. The Extended Programme on Immunisation reached 65 per cent of infants from 12-23 months in 2011; in Nampula province 66.3 per cent of children were reached.¹⁰

Moma District and Topuito Locality

Data on health indicators specific to Moma and Topuito are scarce, though it is likely that the mortality and morbidity profile is similar to those at Provincial level, or slightly worse due to the largely rural population of the District. Data available for Moma District are shown in Table 2.

One recent survey, conducted in 2008 to inform Kenmare's malaria intervention¹¹, provides data specific to malaria and maternal health. This survey showed that, among women age 15-49 who had a birth in the last 5 years, only 43.8 per cent made the recommended four or more ante-natal care (ANC) visits, though 75% attended at least twice and 87.6 per cent at least once. Only 37.2 per cent of pregnant women took any medicine during their pregnancy. 25.5 per cent took at least one dose of IPTp, and 14.6 per cent received two or more doses. In the Topuito area, less than a third (27%) of women seeking antenatal care reached the health facility within two hours, and 73 per cent needed more than two hours. Only pregnant women in Pilivili (85 per cent) reached ANC in less than an hour. First Aid Posts at Pilivili and Larde were the most accessed facilities. The major mode of travel to ANC services was on foot (80.3 per cent) otherwise it was by bicycle. Knowledge of the cause and signs of malaria were reasonable though understanding of the feasibility and importance of prevention measures was low.

Further information on findings is shown in Annex D.

3.4. Health system: structure, functionality and accessibility

Structure

Mozambique's NHS operates in 11 provinces, 128 districts and 30 urban municipalities. The administrative and public health delivery system consists of a national-level responsible for health sector policy and strategic direction and a provincial level, providing technical and policy oversight to the operational level (districts).

- At district level, basic health programme planning and implementation takes place. The District Health Team is in charge of all health services provided at district and community level. On average, the District serves a population of 100,000 inhabitants, but there are extremes ranging from 10,000 to 400,000. Health services in Mozambique are provided at several levels, both formal and informal: In rural areas, traditional healers and herbalists provide the first link in the chain of access to health care and referral in the country. These are supplemented by community health workers (CHW) and traditional birth attendants (TBAs).
- Primary – first aid posts and health centres, providing basic diagnosis and care;

¹⁰ Moçambique Inquérito Demográfico da Saúde 2011, Relatório Preliminar, Instituto Nacional de Estatística & Ministério da Saúde

¹¹ Kenmare Resources, Malaria Assessment Report, October 2008

- Secondary - consisting of rural and district hospitals, the first reference level providing improved diagnostics as well as surgical and obstetric services;
- Tertiary – second reference level providing improved diagnostic and care service and acting as training centres, and
- Quaternary - consisting of central hospitals in Maputo, Beira and Nampula; these are the major referral centres for southern, central, and northern Mozambique, respectively.

The private sector for health care is not well-developed in Mozambique – the 2003 DHS, which provides the most recent figures in advance of the release of the 2011 DHS statistics, estimates that the private sector provides about 16.1 per cent of healthcare nationally.¹²

Functionality and accessibility

A main reason for poor health outcomes in Mozambique is accessibility to health services. An estimated 36 per cent of the population has access to health services, defined as being within 45 minutes' walk of a health facility. This may be an important factor in the high MMR; institutional deliveries remain low at 54 per cent in 2011, with a marked difference between rural (44 per cent) and urban (80 per cent) areas. The aggregated percentage for institutional births in Nampula province was 55 per cent.¹³

The referral system does not function well and patients frequently present at any level of health facility. Reasons for this include low staff skills and motivation, staff and drug shortages, poorly equipped and maintained health facilities and long distances to health facilities. Patients requiring referral to a higher level of health service are often responsible for covering the cost of their own transfer.

Although the MoH is committed to increasing access to health services, as well as their efficiency and quality nationwide, weak health infrastructure and a shortage of healthcare workers are formidable obstacles. The public health sector is by far the largest provider of health services in Mozambique, yet it is estimated only about 50% of the country's population readily accesses these.¹⁴

Nationally, the percentage of the population with access to a health facility within 45 minutes on foot increased from 55 per cent to 65 per cent between 2002-3 and 2008-9. Most progress was noted in rural areas, particularly in northern Mozambique. In urban areas, there was rather a reduction in those with access within 45 minutes on foot – a reflection of rapid urban expansion.

Access to health care remains a serious challenge for the population in Moma District. In 2008, there were 0.41 beds per 1,000 inhabitants and a total of 44 general and 87 maternity beds.¹⁵ Nampula central hospital, 250km and >7h travel time away from Topuito, is the reference hospital for Moma district. Moma district has one hospital (75 Km by road from Topuito locality) and 11 health centres serving a population of >340,000. 17 first aid posts will soon be active, manned by MoH trained community volunteers who will provide basic first aid. Topuito locality has two (currently unmanned) first aid posts and no health centres. One village in Topuito has a TBA.

¹² Mozambique Demographic and Health Survey, 2003.

¹³ Ibid.

¹⁴ PARP 2011-2014

¹⁵ Moma 2008, Estatísticas do Distrito, Instituto Nacional de Estatística 2010

Access to health care in Moma District is also hampered by poor availability of drugs at MoH health facilities. It was not possible to assess the level of stock outs of essential medicines within Moma district or Topuito locality, however, verbal reports suggest significant supply chain problems and periods of stock outs in the district in excess of 3 months in 2011. The MoH has faced increasingly serious difficulties in its procurement and logistics services, which have resulted in nationwide stock outs of medicines at different levels of the health system. In 2011, many medicines were discovered stockpiled in Maputo, and others have accumulated at provincial or district level – while direct service providers have faced stock outs.

3.5. Projects

Prior to Kenmare’s move to support community health in Topuito locality the only health provider was the MoH. In the wider District, there are more organisations active, including Save the Children, Elizabeth Glaser Paediatric AIDS Foundation, and two USAid-funded projects.

3.6. MoH Strategic Priorities

The health sector strategic plan states the central concern of the Government of Mozambique is to improve equitable access to essential health services.¹⁶ The guiding principles of the plan are summarized in Box 3.

Box 3. MoH Strategic Priorities

- Emphasis on primary health care and community involvement
- Equity and social protection for vulnerable groups. Focus areas include neonatal and infant care, sexual and reproductive health, infectious diseases, and non-infectious diseases e.g. diabetes, asthma.
- Universal access to health care and services. Focus areas include HIV transmission prevention, testing and treatment services, malaria prevention and treatment services and ANC and maternity services.
- Community mobilisation and involvement. Standardisation of services provided by CHWs has been prioritised; the primary focus will be on promoting better health at community level, with a focus on prevention and control of infectious diseases, child and reproductive health.
- Institutional and human resource development
- Promotion of partnerships, local and international collaboration
- Development of healthy life styles and behaviours
- Advocacy

4. PROGRAMME CHARACTERISTICS

4.1. Conception process

In 2004, prior to construction of the mine and initiation of operations, Kenmare established KMAD, a not-for-profit independent organisation through which its social responsibility programme is run.

¹⁶ PESS 2007-2012

KMAD supports and contributes to the development of the communities close to the Mine, assisting community members to improve their livelihoods and wellbeing'.¹⁷

Prior to 2007, KMAD's health activities in the community were limited to a focus on HIV awareness and prevention (in coordination with the Mozambican NGO Development Aid from People to People) and *ad hoc* logistical and financial support to the MoH for routine vaccination and other health campaigns in the District.

In 2007 KMAD undertook a formal strategic planning process, to develop an implementation plan covering the 2008 – 2013 period. Consultation with the District Health Teams (DHTs) and the communities was undertaken, though there was no formal health impact assessment.

During the strategic planning process, KMAD identified two focus areas for activities – economic livelihoods and well-being. Health falls under the well-being category. However, it is notable that the livelihoods programme, which includes an agricultural component, also has the potential to impact the nutrition of the local population, though this has not yet been documented. The mine also brought the electrical grid to Topuito locality, again also likely impacting quality of life for local residents.

Notwithstanding these additional health-related factors, the health component of the strategic plan was developed, as far as possible, in line with the following principles:

- Adherence to national MoH strategic priorities (Box 3 in previous section)
 - This was achieved through a focus on these priorities by the KMAD team and the DHT
 - Response to expressed community needs
 - Extensive community consultation was included in planning process
- Response to expressed needs of the DHT
 - Extensive consultation was included in the planning process and the DHT reviewed drafts of the strategic plan
- Response to main health issues likely to impact on Kenmare's work force.

Achieving appropriate balance between these principles was sometimes challenging. Malaria was considered highly likely to result in considerable lost work days per year given the high malaria prevalence in the area and the fact that many employees were likely to be drawn from, and live in, the surrounding communities. Malaria control would need to be a key component of the plan despite not being expressed as a priority by communities. The likelihood of the mine's activities increasing the relatively low HIV prevalence in the area, through increased disposable income in surrounding communities and flows of migrant workers meant that HIV control was an important component to minimise the health impact of the programme, despite it not being a current priority for communities.

The most obvious and pressing need in the area was that of health care provision. This was identified as the priority for the health component of the social responsibility programme and responding to this would address the main community and district priorities, and a number of national MoH

¹⁷ Kenmare Company Community Interaction. <http://www.kenmareresources.com/responsibilities/company-community-interaction.aspx>. Accessed 4 April 2012.

strategic priorities including: emphasis on primary care, universal access to health care and services, institutional and human resource development, promotion of partnerships. Additional programmes for malaria and HIV were planned to address company priorities.

4.2. Description of the health programme (employee and community)

To frame the section a brief overview of Kenmare's health programme is given in Box 4.

Box 4. Summary of Kenmare's health programme

Employee: Kenmare contracts I-SOS to provide health services to its employees through a health centre based on its accommodation site. Medical evacuation is provided when necessary to South Africa. Employees also receive 2 LLINs per year and 1 can of insect repellent per month. PSI are contracted to provide HIV education and prevention services to employees.

Community: Kenmare has created a not-for-profit independent organisation, KMAD, through which its social responsibility programme is run. Eight villages in the Topuito locality with a population of 20,152 fall within an approximate 10 km radius of the mine the primary catchment area of the social responsibility programme. An additional four villages from outside Topuito also benefit under the health initiative.

- Fortnightly medical clinics are run at five MoH health centres in Moma district, including two in Topuito locality. Missão Betesda, a Brazilian mission health care NGO is contracted to do this.
- A new health centre is being constructed, which will become a formal MoH health centre and the only one in Topuito locality.
- IRS for malaria prevention is conducted three times a year in all communities in Topuito locality, provided by a sub-contracted firm, A Feira Lda.

Employee

Beneficiaries of Kenmare's health programme include Kenmare employees, short-term labour and sub-contractors who are accommodated on-site or present a work-related illness or injury. Families of employees are not covered by the health programme .

I-SOS has been contracted by Kenmare to provide occupational health services, including regular medical check-ups for staff and accident/injury first aid for all work-related incidents.

The absence of public health care in the area means morning clinics at I-SOS include diagnosing and treating illnesses, such as malaria or gastro-related ailments. Diagnostic services include microscopy and rapid diagnostic tests for malaria. In the afternoons, I-SOS clinical services are reserved for occupational health appointments such as medicals and follow-up.

The I-SOS clinic is staffed by two nurses, one paramedic, one lab technician, one nursing sister and one medical doctor. Kenmare pays for all medical supplies, consumables and drugs, which are procured in Mozambique. To avoid stock outs of common tracer drugs, efforts are underway to diversify the suppliers used to include importing from those based in South Africa. At the time of our interview, the clinic had two days' supply remaining of first line malaria drugs (e.g. Coartem).

On average, the clinic sees 40 patients per day, including medicals, and operates 5.5 days per week, in alignment with the Kenmare work week¹⁸. I-SOS clinic employees are also on-call 24-hours for emergencies for mine employees. This can be extrapolated to approximately 12,870 consultations per year, or a utilization rate of 7.5 visits per Kenmare employee per year, based on March 2012 mine staff figures of 1,715, including sub-contractors.

Protocol at the clinic allows for 4 days' paid sick leave from work to positive malaria cases. Employees are tested on the fourth day after receiving treatment to assess the response to treatment. Complicated cases which require medical evacuation, usually cerebral malaria, are evacuated.

The I-SOS clinic is not involved in Kenmare community health or broader public health initiatives. From the perspective of the I-SOS clinic, although the new public health facility under construction will address many community health issues, it is not anticipated to alleviate their primary health care caseload. This is due to perceptions of the higher quality of services offered by the I-SOS clinic vis-à-vis the public health facility, as well as the capacity of the latter to handle a large caseload from the community.

Community

Eight villages in the Topuito locality, with a population of approximately 20,152 people, fall within a 10 km radius of the mine: Topuito, Thipane, Naholoco, Mulimuli, Cabula, Mtiticoma, Nathaca and Natuco. This is the primary catchment area of Kenmare's social responsibility programme. An additional four villages from outside Topuito (Pilivili, Larde, Nampilane and Guaraneia) also benefit under the health initiative in the form of support from Missão Betesda clinic visits. KMAD has an MOU with the Nampula provincial health authority for the following health promotion and services activities:

- Volunteers from the community were given some basic training in health promotion and disease prevention through an MOU signed between KMAD and the DHS; unfortunately, of the original 20 trained volunteers, only 7 are currently considered active. Exclusively a male volunteer cohort, in the coming two years KMAD plans to actively recruit and mobilize female volunteers.
- KMAD contracts Missão Betesda, a Brazilian-based mission NGO operated primarily by a Dutch doctor (Dr. Pieter deLijster), to provide fortnightly clinical support to five health facilities over a 100km area around Moma district, including the two first aid posts in the Topuito locality – Topuito and Tipane. The villages in Topuito locality which the Missão Betesda team does not visit are informed of these visits and encouraged to attend at one of the two first aid posts. Missão Betesda visits the area fortnightly, normally providing capacity building support to the active community health volunteers from the area and providing basic health and dental care. The Missão Betesda team is composed of a physician and a dentist, who are supported by several of the volunteers on their rounds.
- A health centre is being constructed near Mtiticoma (Figure 3), which will be handed over to the DHT to function as a standard MoH health centre, staffed and run by MoH personnel.

¹⁸ Interview with nursing staff at I-SOS Clinic, 26 April 2012

- Vertical malaria programmes providing IRS in the communities are provided under an MOU with the DHT, who are responsible for ensuring implementation, quality and monitoring of spray activities, with spraying itself sub-contracted to A Feira Lda, a Nampula-based company.



Figure 4. Newly constructed health centre outside Mtiticoma

4.3. Plans for wider impact

Construction of Phase II of the Kenmare mine should be completed by the end of 2012 and operational in 2013, thereby increasing operational capacity by 50%. Phase III, currently undergoing a pre-feasibility study, will open another mining operation that will affect new and different communities where KMAD will begin working in due course.

Any expansion of KMAD's work will be linked to expansion of the mine, and it is anticipated its scope and budget will increase into Phase III. Currently, three years in, the KMAD team is revising its five-year strategic plan, due to the significant scale-up of activities and greater understanding of the context. No phase out of KMAD or of community activities is yet envisioned, although sustainability of interventions is constantly considered by the KMAD team. The livelihoods programmes that have health impacts are also likely to continue and have a positive impact on overall health indicators in the region, though the baseline status for an impact measurement is not known.

The existing MOU between KMAD and the District Health Service (DHS) is founded upon enabling this sustainability, as is evidenced by initiatives such as

- Establishment of a network of community health volunteers for health promotion in the locality;
- Capacity building of existing health workers through regular training by a physician from Missão Betesda;
- Construction by a sub-contractor of a health facility and provision of an ambulance to that facility for referrals, to be integrated within the NHS.

IRS is the only community health intervention financed by Kenmare and not by KMAD. Community IRS activities are implemented by A Feira Lda, who are sub-contracted for this activity by the DHS. This activity is directly linked to the mine and not sustainable, the inherent cost and the remoteness of Topuito locality mean the provincial malaria programme is unlikely to include the area within its defined target area. However, the value-added to the mine's productivity levels through reduction in malaria transmission is evident and Kenmare has determined to support IRS in the communities for at least the next 3 years.

KMAD and Kenmare health activities, while aligned with national strategic priorities, are not designed to impact on national policy. Rather, they are aligned with District plans, and aim, where possible, to build MoH capacity and outreach at this level. For example, the Mtiticoma health facility, paid for from the KMAD budgets in 2011 and 2012, has been constructed in close technical cooperation with the MoH, which will staff and manage it, and it will be integrated within the NHS.

4.4. Partnership (including government): structure and functionality

Details of all partners involved in the health programme are given in Table 4.

Partnership building process

The Country Manager and Community Liaison Officer have both been key in identifying, initiating and building Kenmare and KMAD's partnerships with the MoH, District Administration and NGOs, including the negotiation of all contracts and MOUs, and management of the relationship on an on-going basis. The Community Liaison Officer is pivotal in building and maintaining relations with community leaders. Community leaders are then relied on to communicate with their wider communities.

Government

Kenmare has made considerable efforts to build and strengthen close and effective coordination with local, district and provincial government structures. The health programme is run in close partnership with the government, with a detailed MOU in place between KMAD and the Provincial Health Authority in Nampula.

Currently the Kenmare/KMAD planning cycles are not aligned with District-level strategic planning, however the health issues addressed by the mine do respond to District priorities and are reviewed by the District Administration. Regular and ad hoc meetings and telephone contact are held between Kenmare, KMAD and the health authorities in support of coordination, though no formal reporting currently takes place. No direct monetary support is provided to the government bodies.

The working relationship between the Government of Mozambique, including the MoH, and Kenmare is positive, with both parties agreeing to avoid creating dependencies. The process of building relationships with key members of the local and provincial government has taken time, a focus on communication, and commitment. A close and consultative relationship exists with the DHS in particular; the District Administration is also consulted and updated regularly. This effort appears to be paying dividends given the very good relations observed during the study, particularly at district level.

Maintaining a close relationship with the government sector has meant certain health projects have experienced delays in order to ensure, at each step, the process has been in line with Kenmare's legal commitments and Government policies. This is most evident in the slow progress in the construction of the Mtiticoma health centre, which has required government sign-off on design and construction quality control. KMAD is prepared to partially exceed the terms of the MOU with the DHS to ensure the construction is finished as quickly as possible; this demonstrates flexibility in meeting MoH requirements whilst also attending to the needs and demands of affected communities.

Sub-contractors

KMAD sub-contracts the majority of implementation of its social projects (covering income generation, capacity building and health), as typified by the contractual agreements with Missão Betesda and PSI. Kenmare actively seeks partners for its projects but has encountered some difficulty in finding NGO partners willing to work in Topuito locality and/or with a mining company. This may change as KMAD's reputation develops, its coordination with other agencies is strengthened and as results are documented and shared. KMAD has also encountered a not-insurmountable barrier to partnerships with NGOs which expect that KMAD will carry the cost of all programming, owing to their association to Kenmare.

In order to safe-guard its reputation with MoH authorities and communities Kenmare holds its sub-contractors to a good level of performance. Experience with its sub-contractors has mostly been positive; however one partnership was terminated when it was clear the partner in question lacked the necessary level of experience and capacity.

Communities

The relationship with community leaders requires high levels of effort in order to maintain mutual understanding; all dealings between Kenmare and communities are channelled through the Kenmare Community Liaison Department in order to ensure coherency. The Department is also closely involved in the operations of KMAD. Current Kenmare relations with community leaders are strong, and communication channels are functioning well. Communication between community leaders and their respective communities regarding discussions, negotiations and agreements reached with Kenmare however, appears more problematic in terms of information flow.

Table 2. Overview of the Kenmare health programmer partnership

Partner	Type of Partnership	Description
MoH	PPP	<ul style="list-style-type: none"> Currently, KMAD has a 3-year MOU with the DHS regarding the training of health volunteers, the presence of Missão Betesda in the communities, the construction/operation of the new health facility, and the facility ambulance. No direct financial support is provided to the MoH. Kenmare also holds a 3-year MOU with the DHS for IRS in the community, which Kenmare has committed to paying for at a rate of 3 spray rounds per year, to a stated maximum number of households, to be verified by an independent auditor. Regular and ad hoc meetings and telephone contact are held between Kenmare, KMAD and the health authorities in support of coordination.
Missão Betesda	Sub-contractor	<ul style="list-style-type: none"> Missão Betesda has a multi-year subcontract to provide fortnightly mobile medical care to 5 localities for 5 days on each rotation. The service is run out of public health facilities in

		<p>Topuito, Guaraneia, Mieie, Larde and Pivilivi. Medical and dental clinics are run and the organisation also works directly with the health professionals and health volunteers in the localities to build capacity. With the health volunteers, there is emphasis on awareness raising and promotion of healthy and health-seeking behaviours.</p> <ul style="list-style-type: none"> • Regular meetings are held between KMAD, Kenmare and the mobile medical team, who are based at the Kenmare camp during their fortnightly visits. Missão Betesda provide twice-monthly activity reports, and the programme reports to KMAD's co-financing partner on the project semi-annually. • Until 31 December 2011, the Missão Betesda team was co-financed for 3 years with the Dutch development bank, FMO. FMO paid the salaries of the physician and dentist for their work in Moma district.
PSI	Sub-contractor	<ul style="list-style-type: none"> • PSI has a one-year contract for HIV activities (end March 2013): PSI is responsible for community-level implementation; PSI's Health and Development in the Workplace (SEDE) programme is responsible for HIV activities within Kenmare. • SEDE will conduct a Knowledge, Attitudes and Practices survey, counselling and testing sessions, and a peer education programme. SEDE will also advise on Kenmare's HIV Policy, planned for 2012. • PSI will train community volunteers to run awareness programmes in surrounding communities about safe sexual practices. Both the workforce and communities will be supplied with condoms (and water treatment kits). PSI will monitor and evaluate the programme.
I- SOS	Sub-contractor	<ul style="list-style-type: none"> • I-SOS is a private service provider contracted to operate the Kenmare site clinic for provision of occupational health and emergency health care and evacuation to Kenmare and sub-contractor staff. • I-SOS invoices Kenmare as per its service contract.
A Feira LDA	Sub-contractor	<ul style="list-style-type: none"> • A Feira are contracted to carry out IRS in the community, in coordination with the DHS and the communities. A Feira is contracted to provide 12 spray rounds over a 3-year period, independently verified.

4.5 Governance, monitoring and oversight process

While Kenmare and KMAD are legally separate entities, they are closely tied, particularly through the collaboration with the Kenmare Community Liaison team. At community-level, it was observed that “Kenmare” and “KMAD” are used interchangeably. The KMAD Board of Governors is composed of executives of Kenmare, though the management committee comprises five representatives from affected communities and operations staff from the mine.

A lack of project monitoring data or evaluation means it is difficult to ascertain the level of impact on health this work has had over the last three years within the eight supported communities. Under the direction of the recently-appointed senior manager, KMAD has committed to improving the monitoring of all its social investment programmes, both qualitatively and quantitatively, including conducting a comprehensive baseline.

4.6 Financing

KMAD is currently 100 per cent financed by funds from Kenmare, although is currently renegotiating co-financing for Missão Betesda with FMO.

However, large components of the malaria control measures undertaken in the community are financed through the Kenmare operations budget, and not from the KMAD budget.

Community activities are financed through KMAD (e.g. Missão Betesda, health facility construction) and by Kenmare (PSI’s work and A Feira’s IRS). With respect to employees, all work is contracted by Kenmare directly (I-SOS, PSI’s SEDE activities).

5. PROGRAMME COSTS

5.1. Employee services

Kenmare has sub-contracted I-SOS to run its on-site health clinic to attend to workplace incidents and emergencies, first aid and basic health care for employees and routine medical checks. I-SOS invoices Kenmare as per its service contract. Estimates from the Kenmare finance department in Moma are that the clinic costs Kenmare US\$60,000 per month; this calculation includes the additional staff contracted for Phase II expansion activities as well as the cost of drugs and medical consumables. Clinic start-up costs were incurred during the initial investment phase but are not disaggregated from the rest of the accommodation camp set up costs; they are considered minimal in relation to the mine’s annual operating budget of US\$100M.

The clinic is open year-round, five and a half days per week for regular appointments. This equates to 286 clinic days per annum, with an average of 40 consultations per day, equivalent to 12,870 clinic visits per annum, including employee medicals.

- Based on the March 2012 employee payroll of 1,715 pax (Kenmare and sub-contractors), the utilization rate by mine staff is 7.5 visits per person per year.
- Clinic running costs per annum: **US\$720,000** (US\$60,000 per month)

Kenmare also provide their employees with insect repellent on a monthly basis. The finance department estimates insect repellent costs the company up to US\$10,000 per month.

- Insect repellent costs per annum: **US\$120,000**

Two LLINs per employee per year are distributed to local staff living in the surrounding villages. There are monthly fluctuations in the number of local staff. Based on the March payroll of 898 local staff (permanent and temporary) and a US\$5 LLIN unit cost, this preventive measure costs Kenmare US\$8,980 per year.

- LLIN costs per annum: **US\$8,980**

Kenmare conducts its own IRS in the accommodation camp and mine site. The finance department estimates each spray round costs approximately US\$8,000. IRS is done on an as-needed basis, but averages at quarterly spray rounds.

- Kenmare camp/mine site IRS per annum: **US\$32,000**

EMPLOYEE HEALTH PROGRAMME - TOTAL ANNUAL COST:

- **US\$880,980** or 0.9% of normal annual operating budget.

5.2. Community services

Since the community health programme began in 2009, it has cost approximately US\$995,358; this is an average annual cost of US\$331,786. This figure includes (a) construction costs for the Mtiticoma public health centre – for which some costs have been projected as construction is not yet finished – and (b) co-financing from the Dutch development bank, FMO, of US\$273,250. FMO co-financing covered Missão Betesda salaries for the duration of the 3-year project. The reported health programme costs for the period March 2009 to April 2012 are shown in Table 5.

Table 3. Community costs

KMAD/FMO Community health project	US\$
Salaries:	273,250
Charter flights:	54,661
Community health volunteers program:	6,034
Purchase of ambulance + maintenance:	48,537
HIV prevention activities:	12,982
Malaria prevention (excl. IRS):	9,743
Others (incl. technical support):	8,151
Sub-Total	413,358
IRS community spraying	80,000*

Health Facility Construction	502,000
TOTAL	995,358

*The 3-year budget for IRS in the communities is US\$393,000; the above value represents spend to April 2012.

5.3. Cost effectiveness

Cost/benefit per beneficiary calculations are not yet included in the KMAD or Kenmare health programme. Furthermore, Kenmare staffing levels are fluctuating during Phase II construction, making cost/benefit analysis less meaningful at this point.

However, employee cost/benefit calculations made in this study are:

- Health programme cost per employee (based on March 2012 expansion figures of 1,715 pax): **US\$513 per person per annum**

Improved data collection on activities through targeted monitoring in each supported community would provide quantitative data and allow measurement of impact of KMAD's health programme. The KMAD senior manager, in place since November 2011, is finalising a monitoring plan for all KMAD projects which will fill in the baseline gaps. For the purposes of this study, the following cost/benefit calculations were made:

- Based on an average annual health programme budget of US\$331,786, cost per resident in Topuito locality (approx. 20,152 people): **US\$16 per person per annum**

6. PROGRAMME BENEFITS AND IMPACT

6.1. Employees and families

The Kenmare clinic serves employees, but not their families. The LLIN programme for employees living offsite does, however, provide two LLINs per employee per year reaching a total of 3,592 beneficiaries. International universal coverage measures are calculated based on 1 net covering 2 people, therefore direct beneficiaries of this distribution are:

Direct: the local workforce: **898 people**

Indirect: 3 additional people per local employee: **2,694 people**

The I-SOS clinic maintains on-site health records. In April 2012, there were 827 consultations, leading to 108 positive malaria diagnoses, including 72 local staff (off-site) cases.¹⁹ While Kenmare does not provide health insurance for national or international employees, the onsite health clinic allows them access to good quality healthcare where previously they would have had extremely limited access.

Malaria is by far the leading cause of illness for Kenmare employees and the surrounding communities. From January to the end of April 2011, the clinic registered an average of 98 positive malaria cases per month. During the same time period in 2012, the clinic registered an average of 94

¹⁹ As of 26 April 2012

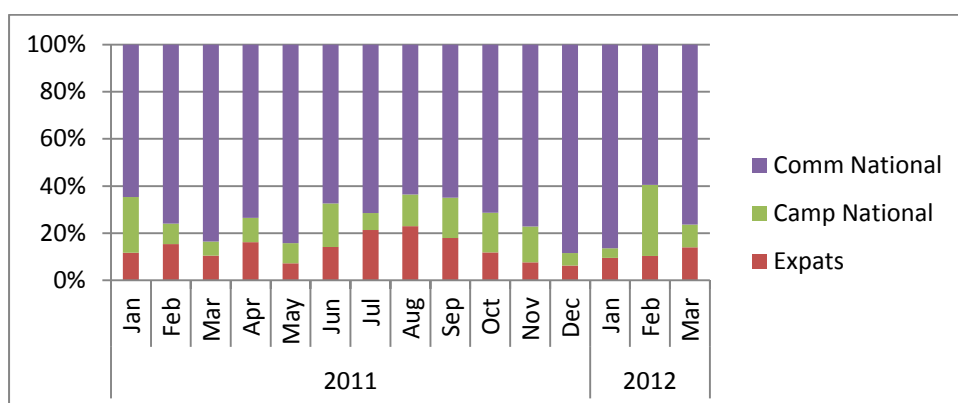
cases per month. Between 1 and 3 evacuations for severe malaria take place each month. Given the burden of malaria in the surrounding communities, this access to facilitated referral for severe malaria is an important benefit. A discussion on the impact on malaria disease is included in the community section below.

An HIV workplace policy is under development and community HIV activities are also being scaled up; all Kenmare staff interviewed were aware of the policy development, suggesting broad consultation.

The first IRS spray round in communities and on-site took place in December 2011 with a second round in April 2012. Currently, data on malaria cases in the community are not available. However, Figure 2 below shows the numbers of malaria cases reported from January 2011 to date, as per I-SOS clinic records for confirmed malaria cases at the Kenmare mine.

Month by month fluctuations are apparent, but there is no clear seasonal pattern. Malaria numbers for early 2012 do appear to be lower than for early 2011 (prior to IRS activities), but without additional years before the study we cannot rule out normal annual fluctuation.

Figure 5. Trends in Confirmed Malaria Cases presenting at Kenmare mine clinic 2011/12



6.2. Communities

The community benefit in a number of ways from health programming, including increased access to:

- Quality health care services
- Basic first aid within communities
- Malaria prevention measures
- Water and sanitation through preliminary drilling of boreholes and digging of latrines

The Moma District Administration calculates the 2012 Topuito locality population at 20,152. Based on an extrapolation of a headcount of six nearby villages in 2008, the population of the eight directly supported villages is estimated to be between 10,000 and 12,000 people. However, the villages are known to be expanding rapidly with an influx of migrant workers, and these numbers are a broad estimation only.

Impact on Disease

No concrete morbidity or mortality data exist for the Topuito locality for a number of reasons. The only existing first aid posts in the area, operating in Topuito and Tipane villages, are not currently functional as the community health workers based there are undergoing the new standardised CHW training being rolled out by the MoH. No other village in the locality has any formal health care. All inhabitants of these localities are obliged to seek health care at the health centres in either Larde or Pilivilili, a distance of 13km and 20km from Topuito respectively, until the Topuito and Tipane first aid posts are manned again and/or the KMAD-constructed health centre in Mtiticoma is opened.

During focus group discussions, I-SOS, Missão Betesda and the District Health Services confirmed the incidence of disease in the locality reflects that of the broader Moma district. The main diseases are malaria, STIs, diarrhoeal diseases, malnutrition and acute respiratory infections, both in adults and children. More thorough monitoring at community level would substantiate this anecdotal evidence. For instance, the IRS and LLIN provided by Kenmare and case management of malaria, if measured, could provide Kenmare and the District with useful data on impact of interventions and for advocacy.

Impact on Access

The opening of the new public health centre in Mtiticoma will have a significant impact on access to formal health care within the locality. Without the backing of Kenmare, no such facility would exist in the locality, and the population would be reliant, as now, on accessing services at Larde, Pilivilili or Moma. The opening of the health centre is anxiously awaited by all communities.

Continuous capacity building of health staff at this health centre, to be provided by Missão Betesda, should also improve the quality of services offered and health data recorded. The health centre will also have the effect of bringing antenatal care (ANC) closer to the villages in Topuito locality, and should support efforts to increase vaccination coverage.

The health facility, once operational, will provide services to a broad population base of over 20,000 people – likely to increase as economic immigration to the area rises. To ease the demand pressure on the new health centre and once the two CHW currently being trained by the MoH return, the first aid posts in both Topuito and Tipane will be able to offer basic diagnostic and treatment services, including for malaria and diarrhoea. The remaining six villages in Topuito locality would also benefit from access to the basic level of care provided by CHW, to mitigate unnecessary pressure on the capacity of the new health facility.

A number of community health volunteers have been trained by Missão Betesda. These undertake disease prevention and awareness raising activities in their communities, such as theatre performances. However, there were conflicting reports as to how active these volunteers were in their roles on an on-going basis, beyond providing support to the fortnightly visits of the mission. The issue of non-remuneration of these volunteers has been a point of contention in terms of keeping the volunteers engaged and active.

6.3. Mining company

Workforce productivity

It is too early to realistically calculate if Kenmare's health programme for its workers is presenting cost savings due to less money lost to ill health. In part, this is due to the mine having passed rapidly

from set-up phase to expansion, meaning a fluctuating workforce and also due to a lack of data demonstrating the impact of the health programme on the number of sick days and the effect of sick days on productivity. Currently, each positive malaria case is given 4 paid sick-leave days, after which the patient is retested and may or may not be cleared to return to work. Taking an average of 96 cases per month, this is equivalent to 384 sick days per month or 4,608 sick days per year in lost productivity. A more detailed understanding and analysis of the nature and extent of malaria's impact on the workforce at Kenmare could help to guide Kenmare's IRS and overall malaria programming.

Social License to Operate

Kenmare's approach to working with local communities and government revolves around proactively engaging with them to address mutual concerns and expectations. A mine accident in Topuito village in 2008 galvanized Kenmare's focus on community and government relations, and today the company's reputation and collaboration with local government is very strong.

Kenmare relations with community leaders are also strong, and communication channels are functioning well. However, communication and information dissemination from community leadership to the respective communities regarding discussions, negotiations and agreements reached with Kenmare however is not always smooth and community members are not always fully-informed of Kenmare's plans as a result.

Greater focus on programme data collection will allow Kenmare to objectively assess its interventions to-date in order to ensure value for money and a focus on approaches and/or activities with greatest return on investment. This will also provide a basis for Kenmare to engage further with existing or new partners, as well as aligning programme measures with national and district health indicators in order for Kenmare to directly link its efforts to MoH efforts to improve health in Mozambique.

6.4. Local government and health system

Difficult to access and remote, rural Topuito locality was scarcely and irregularly served by the formal health system prior to the establishment of the mine. The need to address the basic, primary health needs of the community is clear, and the newly trained CHW and Mtiticoma health centre will go a long way to doing this. When these services are available and the community is accessing them regularly, it is likely the NHS will benefit from improved visibility.

Overall, the presence of the mine has increased the level of funding available for health services in the district. Kenmare provides *ad hoc* support to health campaigns, such as vaccination campaigns, in the district, capitalizing on Kenmare's advanced logistics capacity. This type of support is a very useful catalyst for improving MoH coverage of the locality – for instance, providing transport of medicines and/or supply chain capacity building to prevent stock outs at the two health centres and two first aid posts currently serving the affected population.

The locality has historically been 'orphaned' by the NHS due to its remote location. Kenmare is cognizant as it re-engages the MoH in the area that substitution effect of the company's support for the local health system must not occur. This deliberate action, engaging the MoH at each step to ensure the highest possible level of ownership, has meant slow progress on some projects, such as

the health centre construction, but could likely mean that in the longer-term, Kenmare will have a minimal dependency issue to managed vis-à-vis the MoH.

7. STAKEHOLDER PERSPECTIVES

7.1. Beneficiaries

Focus group discussions were held with four of the eight communities in Topuito locality in order to ascertain the perceived benefits and/or negative impacts of the Kenmare health programme. These discussions covered a range of additional issues related to the impact of the mine and KMAD’s activities on communities, which are not documented here (see Annex F for further detail). Health-related discussions are summarized in Table 6 below.

Table 4. Community perspectives on programme

Village	Advantages	Gaps and disadvantages
Topuito	Village well with pump constructed Visiting doctor twice per month Health centre will open shortly	Wells drilled are not long-lasting No local ANC/birthing attendants Water supply is contaminated Insufficient latrines Visiting doctor does not prescribe medicines Lung problems for those working in the mine ²⁰
Mtiticoma	Health centre will open shortly	Latrines are now full No access to fields – problem of hunger Water access/quality issue Last LLIN distribution in 2009
Tipane	IRS done in communities Visiting doctor twice per month	No hospital access IRS sprays don’t last for very long
Nataca	Have 2 CHV in the community LLIN distributed in 2009	No change in health status before/after Kenmare LLINs distributed in 2009 disintegrated No wells – still drinking from the river Visiting doctor does not visit Nataca

²⁰ Kenmare conducts regular dust monitoring of communities surrounding the mine, and has not thus far noted lung problems among the health issues experienced by the mine’s employees.

Benefits are associated with the presence and accessibility of formal health care for all, but especially for pregnant women and children. Although the communities recognise the benefits of Kenmare/KMAD's health programme, there was concern voiced over a lack of on-going support to initiatives, such as latrine construction. This reflects the fine line between providing support to communities and their ownership of this support to carry it forward, as well as communication and expectations management.

In Nataca village, an example of a community which has a clear idea of how its health can be improved but has restricted access to current initiatives, there is a low perceived direct benefit from the Kenmare and KMAD health interventions. Tipane village, a community with a less cohesive idea of how health could be improved, but which has a traditional birth attendant, a first aid post and directly receives the clinical visits from the Missão Betesda team, the perceived benefits are greater.

In addition, Nataca community made the following observations:

- Access to clean water is the top requirement for improving health.
- ANC care at village level, provided by TBAs from the community would improve knowledge of maternal health – including the importance of ANC, ability to get to a health centre on time to deliver and trained support to those women unable to reach a health facility in time.
- A CHW should be trained from each village in order to provide basic health care and referral to the Mtiticoma health centre, which is expected to be crowded.
- More community health volunteers would contribute to increased knowledge of basic health issues, disease prevention and early treatment-seeking behaviour.
- Community health volunteers could link with the (future) ambulance in order to secure emergency transport to health centres (currently Larde and Pilivili).
- Ensure regular distribution of LLINs to protect children.

All communities raised concerns regarding the lack of immediate access to ANC and maternity services. As only one community has a TBA, pregnant women either attempt to reach the health centres in Larde or Pilivili to deliver, often giving birth en route, or end up giving birth at home, even when recognising the associated risks. ANC services will be available in the Mtiticoma health centre when it opens.

National vaccination campaigns have required parents or caregivers to take their children to Topuito or Tipane; in focus group discussions in Nataca, the distance to these villages was cited as a reason for some parents not completing the recommended vaccinations.

Access to LLIN is limited to those with family members in the Kenmare workforce. The Provincial Health Authority is currently preparing for a province-wide universal access campaign; KMAD is in an ideal position to ensure mine-affected communities are included in the distribution census and reached at the time of distribution.

The health programme is planning to increase the number and scope of its community health volunteers, targeting the inclusion of women into the next volunteer cohort. While generally important for the success of a community health volunteer programme, the inclusion of women as peer educators for HIV information and prevention within communities will be particularly important.

Kenmare and KMAD are clearly attempting to address a number of key health issues, while not undermining the health authorities – and indeed are supporting extension of the reach of the NHS. Alignment of efforts on the part of the mine and recognition on the part of the community commensurate with the services being offered is not necessarily a given in the short-term.

7.2. Partners (including government)

There is general consensus that communities will have considerably more access to health care once the two first aid posts in Tipane and Tupuito, as well as the Mtiticoma health centre are operational. Responsible handover of the Mtiticoma health centre has been detailed in the MOU between KMAD and the DHS, clearly defining the roles and responsibilities of both parties. A phased approach to future support following handover of the completed centre will allow its integration within the NHS. Addressing access to information at community level through trained health volunteers, if proactive, will positively impact on health knowledge and behaviours.

The access to a medical doctor for clinical issues and continuous capacity building provided to health personnel through consultations is also considered to be of significant benefit to communities, which would otherwise rarely have access to a doctor.

Management of community and government expectations is the greatest challenge Kenmare and KMAD face; however, the current District Administrator is aware of the economic considerations faced by Kenmare in assessing its level of support to health and other areas in Moma district. When asked if he had any recommendations for future collaboration with the mine, the Administrator compared this to ‘asking a hungry person what they would like to eat...Everything!’.

8. ANALYSIS OF PROGRAMME STRENGTHS

8.1. Strategic issues

Kenmare and KMAD’s approach to their community health programme has had a number of notable strengths and successes including:

- Taking initiative in finding partners and developing a programme from a very limited/non-existent health structure in the locality;
- Programming has been conscious of addressing the main health issues affecting workforce and community;
- Malaria prevention activities have been appropriately prioritized;
- Pursuing responsible partnership with local government has been a focus and shown results;
- Vertical ‘baseline’ studies (e.g. on malaria) conducted at the outset of activities have provided a solid platform for future impact evaluations.

Challenges for scale up or replication of the current interventions will be directly affected by KMAD’s ability to measure impact and monitor the progress of its health activities. Should the programme expand to new areas affected by mining operations, the challenge will be to carry relevant lessons learned from Phase I health programming and adapt it to the needs and constraints of subsequent expansions and communities.

KMAD would benefit from the ability to monitor impact of all of its programmes in order to ensure value for money. This could be achieved through a combination of regularly performed qualitative

and quantitative monitoring. Clear definition of minimum project information requirements would simplify and standardise data collection, ensuring only useful, relevant data is collected, and human and other resources are used economically.

Particular strengths of the Kenmare programme are its approaches in the areas of process and partnership building, in particular at the following stages:

- **Conception and design: responsive, appropriate and with a view to sustainability where possible**
 - Kenmare managed to achieve a balance in its programme design, recognising the need to respond to community and government priorities, yet also to address the likely health needs relevant to the company and assuming responsibility for the effects of the mine on surrounding areas.
 - Kenmare deliberated carefully prior to finalising its health care programme, wanting to ensure sustainability of interventions through coordination and integration with the NHS, and in consultation with communities. The new KMAD strategic plan provides an opportunity to build on and clearly articulate this commitment to sustainability through longer-term exit strategies and plans for expansion to new communities. Scale-up needs also must be considered, taking advantage of the considerable lessons learned in the initial three years.
 - Kenmare has prioritised strengthening the public health system with a view to the most likely route to sustainability. While they have prioritised the need for immediate impact on malaria beyond the need for sustainability (the IRS programme is not sustainable beyond Kenmare’s support) they commit to continuing the IRS as needed as long as they remain operational in the area, expected to be in the long term.
 - Attempting to build co-financing relationships with NGOs and fellow donors has not yet shown results but may be shown in the medium term to be an effective way of widening the impact of the programme and improving sustainability of interventions.
- **Partnership: carefully built, held to account and with effective and clearly defined relationships**
 - In line with their desire for sustainability, Kenmare and KMAD have forged strong partnerships with government at all levels from the outset. Including provincial and district health and administrative authorities from the planning stage, ensuring clear and mutually acceptable MoUs are in place and maintaining regularly contact shows how strong relationships can be built.

Useful **lessons for best practice guidance** can also be drawn from some of the gaps in Kenmare’s approach:

- Collection of data on the relationship between workforce health and productivity, the health of the workforce and supported communities and the performance of cost-benefit analyses would be hugely valuable:
 - To the Company:

- Who may not be realising the full potential benefit from health care intervention.
- Who may need data to present the case for continued or expanded support to the initiative from their own governance levels.
- To allow them to present and advocate for additional partnerships, with donors, such as the potential further FMO partnership under discussion; but also with NGOs who the company has so far found difficult to engage.
- To the national health system:
 - Who would be able to leverage such data to develop their own proposal for additional funds for similar programmes
 - Who would learn lessons about appropriate and cost-effective approaches in such areas.
- To the wider international health and development community:
 - Who would have better data to inform decision making about engaging in partnerships with similar companies on similar programmes.
 - A formal health impact assessment, as just one part of the strategic planning process, may help also build the case for a rationale decision on the appropriate size of the financial support.

8.2. Operational issues

Greater engagement with local communities and government has improved the operational context, however, there remain challenges in managing the expectations of community members.

Opportunities may exist for greater coordination and collaboration with NGOs working in the province, however, once again, managing financial expectations of these and of Kenmare remains a challenge. One lesson learnt is that community engagement by Kenmare and KMAD should not rely purely on links to community gatekeepers. By directly working with communities themselves, rather than only community leaders may be a more reliable approach to managing community expectations and to understanding community perspectives.

Access to and by some communities will continue to be a limiting factor until infrastructure improves, and as such should be incorporated into planning; KMAD has significant logistics resources at its disposal, thereby mostly overcoming the disadvantages of a remote location and poor road system.

The main challenges of managing expectations of communities and local governments and partners will carry over into any future health-related interventions KMAD or Kenmare undertake. The value placed on Kenmare support in health by the district will be commensurate with Kenmare's ability in the medium- to long-term to demonstrate a positive impact on health indicators.

Annex A: Case study information sources

Date	Activity
23 April	Briefing with Kenmare Country Manager - Maputo
24 April	Interview with Provincial Malaria Coordinator
25 April	Interview with Environment, Health and Safety Manager
	Interview with Finance Manager
	Interview with HR Manager
	Interview with KMAD coordinator
	Interview with Community superintendent
26 April	Interview occupational health center/practitioner
	Interview work force representatives
27 April	FGD Communities – Topuito, Mtiticoma
28 April	FGD Communities – Tipane, Nataca
30 April	Interview District health authorities
	Interview District Administrator (Moma)
1 May	Interview MCT (Dr Pieter)
	Interview A Fiera Lda.

Annex B: Further information on findings of a 2008 baseline survey in malaria and maternal health

Baseline data prior to Kenmare implementing its health interventions in Topuito locality is scant as the area is extremely remote and difficult to access. The exception is data gathered during a baseline survey contracted to Malaria Consortium in 2008, to inform the development of Kenmare's malaria intervention.

This survey provided the information on ANC and malaria detailed below.²¹

Maternal Health

Among women age 15-49 who had a birth in the last 5 years,

- 87.6% had attended ANC services at least once,
- 75.0% at least twice and
- 43.8% four or more times.

ANC services were predominately provided by public health facilities (80.8%) with the first aid posts at Pilivili and Larde being the facilities most accessed. In the Topuito area, less than a third (27%) of women seeking ANC reached the health facility within two hours, and 73% needed more than two hours.

The major mode of travel to ANC services was on foot (80.3%) otherwise it was by bicycle. Only pregnant women in Pilivili (85%) reached ANC in less than an hour.

Only 37.2% of pregnant women took any medicine during their pregnancy, with 25.5% taking at least one dose of intermittent preventative treatment of malaria (IPT). Only 14.6% of pregnant women received two or more doses of IPT.

Malaria

The survey assessed respondent's knowledge of malaria symptoms, transmission and prevention. The leading symptom of fever alone was known by 65.8% of respondents and on inclusion of "feeling hot" or "chills, shivering", 77.8% responded correctly. However, the importance of anaemia ("weakness/loss of blood") was only known to 4%.

Slightly more than half (52%) respondents were aware mosquitoes are involved in the transmission of malaria. However, less than one third of women mentioned mosquito nets as one of the ways to prevent malaria (28.6%). More common was a fatalistic view that nothing could stop malaria, which was mentioned by 47.2% of respondents.

Knockdown spray-catch yielded high densities of *An. funestus* s.s in all villages in the locality. Overall the average density of *An. funestus* s.s was 3.5 per household while *An. gambiae* s.l. was 0.2 per household.

Manual capture yielded higher density of *An. funestus* s.s in all villages; 97.9% of all *Anopheles* mosquito captures, with Naholoco yielding the highest density at 18.7% per household, followed by Natuco.

²¹ Kenmare Resources, Malaria Assessment Report, October 2008



These results represent a baseline for knockdown spray-catch yield and manual capture yield, but are inconclusive until comparative follow-up work is done following subsequent IRS rounds.

Annex C: How the KMAD programme responds to MoH strategic priorities

MOH Strategic priority	Kenmare Programmes
Emphasis on primary health care	Missão Betesda medical and dental consultations: increasing access to primary health care and minor surgical procedures.
Equity and social protection for vulnerable groups	When functional, a number of relevant services will be provided by the Mtitcoma health centre, including support to key vulnerable groups: young children, pregnant women, people living with HIV/AIDs.
Universal access to health care and services	Construction of Mtitcoma health centre and provision of ambulance: supporting greater access to primary health care and referral services. Universal coverage of malaria prevention through IRS provision.
Community mobilisation and involvement	Supporting medical and dental consultations through Missão Betesda: increasing access to primary health care and minor surgical procedures; development of health worker skills; development of CHW and volunteer skills, impacting on life styles, behaviours and community mobilisation.
Institutional and human resource development	Supporting CHW and volunteers: promoting healthy behaviours and increasing community knowledge and mobilisation.
Promotion of partnerships, local and international collaboration	KMAD MOU with District Health Services; supporting medical and dental consultations through Missão Betesda: HIV awareness raising through PSI.
Development of healthy life styles and behaviours	<p>Installation of water pumps: improved hygiene and access to clean, safe water.</p> <p>Long lasting insecticidal net distribution: supporting efforts to prevent malaria.</p> <p>Supporting CHW and volunteers: promoting healthy behaviours and increasing community mobilisation.</p> <p>HIV prevention activities: promoting healthy behaviours</p> <p>Supporting medical and dental consultations: increasing access to primary health care and minor surgical procedures; development of health worker skills; development of CHW and volunteer skills, impacting on life styles, behaviours and community mobilisation.</p>

Annex D: Further details on findings of community focus group discussions

Health issues of priority concern to communities

Community	Issue Area
Topuito	Lung problems Malnutrition
Mtiticoma	Malaria Malnutrition (esp. Elderly) Stomach pains Fibroids STIs (implied) Hernias
Tipane	Malaria Eyesight issues Headaches Hernias Dental problems Arthritis
Nataka	Malaria Measles Worms Bilharzia Stomach pains (general) Hernias Joint pains

Perceived benefits /negative impact of Kenmare/KMAD activities

Community	Benefits	Negative Impacts
Topuito	New school + materials Brick houses Well with pump Electricity to houses New roads Visiting doctor Disposable income – luxury goods Health facility Approx. 9 association projects Dr. Peter comes	Dependency mentality Wells drilled but not long-lasting No local ANC/birthing attendants Loss of farmland; slow recovery of mining lands to return to farming Restricted fishing area Contaminated water supply Not enough latrines Dr. Pieter does not give medicines Lung problems for those working in the mine Increase in basic food prices (rice, flour) Older population doesn't have access to their land Lack of food access
Mtiticoma Pop. 1,400	KMAD income generation projects Health facility School constructed With relocation, improved housing, electricity Scholarships to support students	Land compensation price insufficient Latrines are now full No access to fields – problem of hunger Water access/quality issue School too small Last LLIN distribution in 2009
Tipane	IRS done in communities associated with Kenmare Dr. Peter's visits are valuable	No hospital access IRS sprays don't last for very long
Nataca	Have 2 ACS in the community LLIN distributed in 2009	No real change in health status before or after Kenmare No wells – still drinking from the river Dr. Peter does not visit Nataca

Recommendations to Kenmare from community members

Village	Recommendations
Topuito	<p>More sensitization on how to use/protect the wells</p> <p>Get the health facility opened as soon as possible</p> <p>Need to continue supporting and improving the community health volunteer programme</p>
Mtiticoma	<p>New latrines need to be dug – perhaps in conjunction with the community to facilitate proper management</p> <p>Improved infrastructure in general</p> <p>Kenmare support the elderly</p> <p>Mtiticoma as a model relocation village</p> <p>Give all of Mtiticoma a job</p>
Tipane	<p>Improve the Nampula road</p>
Nataca Est. pop. 1,000	<p>Access to clean water – not currently a reality. Priority no. 1 for improving health</p> <p>Training of 2 TBAs in the community to avoid the need to travel by road and possibility of delivering en route</p> <p>Increase no. of CHW in communities and number of sensitizations on a variety of subjects</p> <p>Regular distribution of LLINs to protect children</p> <p>A functioning first aid post in case of an emergency and to supplement the new Type 2 facility, which is going to be crowded</p> <p>ANC care provided in the village</p> <p>Get the ambulance service going now, even if the Type 2 facility doesn't open for some time, at least emergencies can go to Larde or Pilivili</p>