

Transport and Health

An Exploratory
Study of
Suba District
in Kenya

Final Draft

Jeff Maganya
Kenneth Odero
Kaendi Munguti

Acronyms Used in Text

AIDS	Acquire immune Deficiency Syndrome
ANC	Ante Natal Care
ERS	Economic Recovery Strategy
ERS	Economic Recovery Strategy
FGD	Focus Group Discussions
GDP	Gross Domestic Product
GOK	Government of Kenya
HIV	Human Immune Virus
IMT	Intermediate Means of Transport
ITDG	Intermediate Technology Development Group
MDG	Millennium Development Goals
NMT	Non Motorized Transport
PRSP	Poverty Reduction Strategy Papers
SA	Special accessibility
STDs	Sexually Transmitted Diseases
TB	Tuberculosis
WB	World Bank
WHO	The World Health Organization

Table of Contents

Acronyms Used in Text.....	2
Table of Contents.....	3
Executive Summary.....	4
1.1 Kenya.....	1
1.2 Suba District.....	1
1.3 Transport and Health in Kenya.....	4
1.4 Access to Healthcare.....	7
1.5 Economic Recovery Strategy, Transport and Health.....	10
2.1 Methods of Study.....	12
3.1 Common Diseases and Transport Needs.....	15
3.1.1 Common Diseases.....	15
3.1.2 Transport Demands for Common Diseases.....	17
3.1.3 Factors Affecting Availability of Transport to Health Services.....	21
3.1.4 Cost of Transport to and From Health Institutions.....	23
3.2 Opportunities for Improving Transport for Accessing Health Services.....	28
References.....	35

Executive Summary

This case study, undertaken in Suba District in Nyanza Province, Kenya, examined mobility and health linkages. The study areas were selected based on key health and transport indicators notably: areas near Ruma National Park which has long walking distances to goods and services and motorized transport services, Mufangano Island which is two hours away by boat from the main market and health facilities, and the fishing villages in Ringiti Island. The study assessed and analyzed issues related to maternal health, malaria, and gender disparities in relation to mobility using combination of qualitative and quantitative research methods was used to collect and analyze data. The approach included review of relevant literature and resources followed by a participatory appraisal of key respondents. The key tools used included Focus Group Discussions and assessment of needs and ranking of priorities.

The study makes some interesting findings. Overall, the main barriers in transport to accessing health institutions in Suba are lack of transport services (including boat services), lack of money for transport services when the services are available, and lack of specialized affordable method of carrying patients who are not able to walk. People also face risk walking to health institutions especially in areas that are near the Ruma National Parks. Walking across mountainous terrain with a sick person was reported to be a burden.

In Locations covered in the study (Gembe, Wakianga/Waware, Kamasengre, Kawanga, Kaksingri East, Ruma, Gwasssi West and Mbita Township) the people have adapted self medication, including drinking water, massages and purchase of over the counter medication to deal with common interventions for mild illnesses and cope with transport difficulties. A number of intermediate forms of transport have been developed to improve access and provide means of transport in cases of severe medical conditions. These include use of bed stretchers, wheelbarrows, bicycle, handcarts, as well as use of boats for water transport.

Localized conditions, for example, fear of wild animals in areas bordering Ruma National Park notwithstanding, no overall pattern in terms of transport challenges or preferred interventions is discerned from any of the study areas characterized as savannah, island or mountainous. The same is true when the data is disaggregated and analyzed by gender. As a result, this exploratory study marks the birth of further detailed research on the relationship between transport and health in and possible transport and mobility interventions that may be considered in attempted to improve access to health in Suba and indeed the whole country.

1.1 Kenya

Kenya is a country in the eastern seaboard of the Indian Ocean. It is an African country that borders Ethiopia and Sudan to the north, Somalia and the Indian Ocean to the east, Uganda to the west and Tanzania to the south. Kenya covers total of 582, 700 km² and has a population of 32.2 million people of these 22% are aged between 15 and 25¹. Kenya is the twenty-second poorest country in the world with a per capita income of US\$ 239. The number of unemployed stands at 14.6% of the labor force, with the youth accounting for 45% of the total². Kenya is one of the most unequal countries in the world with the top 10 households controlling 42% of the total income, while the bottom 10% control less than 1%³. The HIV/AIDS pandemic has added to the problems that Kenya has, there are 700 deaths per day from HIV/AIDS in Kenya⁴. This translates to about 1200 children either orphaned or left without one parent on a daily basis. Kenya has 1.3 million orphans⁵.

Poverty is a major developing world problem, considering that half the world, nearly three billion people, live on less than two dollars a day⁶. Kenya is a microcosm of the bigger development challenge as the number of people living on less than one dollar a day is estimated at 17 million or 56% of the total population⁷. In Kenya there are wide regional, gender and age disparities in poverty levels. 75% of poor people live in rural areas while the poor in urban areas live in slum areas or peri-urban settlements⁸.

1.2 Suba District

Suba District is one of the more than a dozen districts in Nyanza province in the western part of Kenya. The District has five administrative divisions

¹ Estimate by Government of Kenya, *Economic Survey 2004* (Nairobi: Central Bureau of Statistics, 2004 p8)

² Government of Kenya, *Economic Recovery Strategy for Wealth and Employment Creation: 2003-2007* (ERSP) (Nairobi: GoK, 2003)

³ Society for International Development (SID) *Pulling Apart: Facts and figures on inequality in Kenya*. (2004, pg 5)

⁴ *National Programme Guidelines on Orphans and other Children Made Vulnerable by HIV/AIDS* (Republic of Kenya, National Aids Control Council: March 2003)

⁵ Republic of Kenya, *National Development Plan, 2002-2008*, (GOK, Nairobi: 2002)

⁶ This figure is based on purchasing power parity, which suggests that prices of goods in countries tend to equate under floating exchange rates and therefore people would be able to purchase the same quantity of goods in any country for a given sum of money. That is, the notion that a dollar should buy the same amount in all countries. Hence if a poor person in a poor country living on a dollar a day moved to the U.S. with no changes to their income, they would still be living on a dollar a day. The World Bank has been criticized by some scholars for almost arbitrarily coming up with a definition of a poverty line to mean one dollar per day (of which they say there are about 1.3 billion people).

⁷ GOK, *Economic Recovery Strategy for Wealth and Employment Creation: 2003-2007* (June 2003)

⁸ GOK, *ERSWEC ibid.*,

namely Mbita, Lambwe, Gwasssi, Mfangano and Gembe. The district occupies land mass 1056 km² and a water mass of 1190 km². It has sixteen islands with Rusinga and Mfangano being the largest⁹. The population of the district is 1444,000 (1999 National Census). Mfangano has the highest population density with 273 persons per Km² while Gembe has the lowest population density of 98 persons per km².

The District altitude ranges from 1143m to 2134m above sea level with the main relief features being an upland plateau composed of undulating surfaces with the high areas being the Gwasssi Hills to the south, Gembe hills to the north and Mfangano hills as the dominant centre of Mfangano islands. To the east of the District is the Lambwe Valley, which lies 1219m above sea level and is characterized by savannah grasslands and is home to the Ruma National Park. In the west and northern most parts of the district are the shores of Lake Victoria which has rich fishing grounds.

The annual rainfall in Suba ranges between 700-1200 mm per annum with the higher areas of Gwasssi and Mfangano having two reliable rainy seasons, while the rest of the district has only one reliable rainy season. The long rainy season occurs between March and April (locally known as “*Chiri*” Season) and the short rainy season occurs in December (locally known as “*Opon*” season). The rains bring with them some water borne and water based diseases and transportation difficulties on roads and on the lake. Suba is inhabited by the Luo and the Luo Abasuba. Both communities are patrilineal and land is normally acquired through inheritance from father to sons. As a consequence, women who are married into the locality don’t get ownership of land other than through their husbands, and the ones who are married to other localities “lose their land rights”¹⁰. Land is important as it is the only property and capital that people of Suba inherit. Polygamy is an accepted practice amongst the two communities. Employed in mainly fishing and agricultural sectors, most farmers in the area undertake subsistence farming, with sorghum, maize, sweet potatoes, cassava, and legumes as the major crops. Livestock husbandry is also common within Suba. The animals kept include cattle, goats, donkeys, and chicken.

Rusinga Island is connected to the mainland by a causeway. Mfangano and other outlying islands like Ringiti and Remba islands remain more isolated and can be reached only by a 15-km boat trip from the mainland.

⁹ GOK (2000), *District Development Plan, Suba District 2002-2008* Ministry of Planning and National Development, Nairobi

¹⁰ While in national law, women have the right to inherit their parents land, however achieving that right is circumvented by social norms that have prohibited women from living within the locality that they are born in, one indicator for the social unacceptability of local women living in the same locality is shown through the burial ceremony of a woman who has to be buried in her parents home. They are buried outside the fence as they are considered bad spirits.

Table 1: Summary of Key Attributes of Suba District.

Attribute	Statistic
Area Km ²	1055
Altitude (M)	
Highest	2275
Lowest	1125
Rainfall	700-1200
Temperature (C°) Average	26
Population	
Male	82246
Female	88080
Growth rate (%)	3
Pop. Density (Pop/Km ²)	163
Average Household Size	5
Total Absolute Poverty	25.25%
Sector Contribution to Household Income	
Agriculture	51%
Rural self Employment	1%
Wage Employment	5%
Urban self Employment	3%
Fishing	40%
Number of Primary Schools	172
Number of Tertiary Schools	12
Number of Hospitals	0
Doctor/Patient Ratio	1:85036
Average Distance to Health Facility	2
Total Km of Roads	
Bitumen	0
Graveled	67
Earth	323.9
Total	390.9
Unpaved	390.9

Source: GOK (2004), Kenya. *GOK/SIDA Roads 2000 Programme, Proposal Nyanza Roads Maintenance Programme*. Ministry of Roads and Public Works, Nairobi

The district can be divided into three eco-economic zones, a low potential zone, and a higher potential zone and the highlands. Table 2 below shows the attributes of the zones.

Table 2: Attributes of three Eco-Economic Zones in Suba

	Location	Economic activities	Rainfall
Low potential Zone	Between 10-12 Km from the lakeshore including Kaksingri, Gembe, Rusinga, Lambwe East.	Fishing, trade in fish, cattle, goats sheep, chicken rearing, general small trade, cultivation of maize, millet, sisal making, charcoal burning. Large potential for cotton	Less than 800 mm most of it the long rains of March and May.
Medium Potential	Over 10-12 Km from the lakeshore including Kaksingri East, Ruma and Lambwe West.	Fishing, trade in fish, cattle-, goat-sheep-, chicken-rearing, general small trade, cultivation of maize, millet, sunflower, sisal making, and charcoal burning.	Between 800-1200 mm in two seasons, the long rains of March and May and the short rains of August and December.
Highlands	Gwassi and central parts of Mfangano	Fishing, trade in fish, cattle-, dairy cattle-, goat- sheep-, chicken-rearing, general small trade, cultivation of maize, millet, sunflower, sisal making, and charcoal burning.	Over 1200 mm in two seasons, the long rains of March and May and the short rains of August and December.

Source: Field work

1.3 Transport and Health in Kenya

In Kenya transport planning has had limited success in meeting the access needs of most rural populations. While most people expend a lot of time and effort in transport activities related to basic subsistence, economic and social needs on paths and tracks in rural areas, the transport objectives are focused on roads. In 2001 there were 633,760 vehicles, about 20 vehicles per 1000 people¹¹. Meanwhile thirty percent of all public spending went to road transport, more than on any other economic sector. Despite that, poverty prevalence rates increased from 47% in 1997 to 55.7% in 2001¹². This is of concern as part of the justification for transport investments is growth *with* equity. The implication is that Kenya has been investing in the transport sector without clear improvements in poverty reducing output¹³. Transport problems associated with production and marketing reduces opportunities for income generation in agriculture and trade while poor access to health care and other social services affect the quality of life.

Studies in Africa have shown that rural families and particularly women have access and transport problems associated with health. In southern Nigeria, for example, many women expressed a lack of faith in modern medical care for complications of pregnancy, however, they frequently sought hospital treatment for medical emergencies not amenable to cure by traditional methods and when asked to identify their health service priorities, they mentioned better training of health centre staff and the provision of ambulances for emergencies¹⁴.

A health survey in rural Kenya revealed that the two most common reasons given for not bringing illness episodes to a clinic or hospital were clinic being far way and high transport costs¹⁵. Secondary health care needs suffer more because of transport constraints, for example access to surgery in rural areas in developing countries is limited by low capacity, long distances to travel, poor roads and user or cost-sharing charges¹⁶. In addition to these problems, Kenya and other developing countries are having problems expanding and/or maintaining their current road network. Motorized transport has also demonstrated limited relevance to transport activities and patterns of rural people who head load and walk to most destinations. The Heavy investment in physical transport infrastructure for motor vehicles has been assumed would culminate in a situation where access needs of all would be broadly adequately catered for. Because the pre and post colonial policies focused on the use of agricultural raw materials from rural areas, the drive

¹¹ GOK (2002) *Statistical Abstracts*, Central Bureau of Statistics, Ministry of Planning and National Development, Nairobi.

¹² GOK (2003) *Economic Survey, 2003* Ministry of Planning and National Development, Nairobi

¹³ GOK (2004) Recommendations on Integrated National Transport Policy: *Moving a Working Nation*. Ministry of Transport and Communications

¹⁴ Asowa-Omorodion F. I., "Women's perception of the complications of pregnancy and childbirth in two Esan communities, Edo State, Nigeria". *Social Science and Medicine* 1997; 44: 1817-24

¹⁵ Oranga HM., Nordberg E., A longitudinal health interview in rural Kenya: Potentials and limitations in for local planning. *East African Medical Journal*, 1995; 72[4]: 241-247

¹⁶ Wachira J. and Nordberg E., "Airborne surgical outreach services in Eastern Africa". *East African Medical Journal*, 1998; 75: 563-566

for construction of infrastructure for motor vehicles has not changed and roads have become major arteries of new growth.

Kenya's economy recorded high growth rates of Real Gross Domestic Product (GDP) averaging 6.6% per annum (p.a.) during the immediate post-independence years (between 1964 and 1973). Deceleration of real GDP growth which started in late 1970s continued until 2002 when the economy registered a record negative growth rate of 0.2%. During the years 1997-2002 economic growth declined steadily with GDP recording average annual growth rates of only 0.9%, against a population growth rate of 2.9% p.a. According to the government of Kenya among the factors contributing to the economic decline is poor infrastructure, particularly bad roads¹⁷. Most roads in Nyanza province are in a state of disrepair rendering many rural areas totally inaccessible especially in the rainy season which has led to a situation where inevitably farmers, fishers, traders etc are unable to import production inputs and transport produce to the market in time¹⁸.

The Kenyan government transport white paper has recognized the importance of Non-Motorized Transport (NMT) and Intermediate Means of Transport (IMT) in addressing the needs of the poor as well as in promoting the health of the population. The white paper has proposed integration of NMTs and IMTs in the design, development and operation of all modes of transport in urban and rural areas¹⁹. IMTs have been used historically for many purposes, elementary transport systems such as horses, donkeys, mules, and camels have been used in the mobile health services for decades in developing countries²⁰. Other aspects of change in planning to accommodate transport needs of poor people are evident in the Roads2000 programmes that operate in Nyanza, including Suba District. The Roads2000 strategy in Nyanza has intentions to undertake work on community roads which are described as village level access roads linking communities to socio economic centers within and/or outside the village, these roads are to be conceived planned constructed and maintained by local communities²¹. For more information on the Roads2000 project in Nyanza visit the following website: www.roads2000nyanza.co.ke

Table 3 below shows goods and modes of transport of rural community people in western parts of Kenya.

¹⁷ GOK (2004) Recommendations on Integrated National Transport Policy: *Moving a Working Nation*. Ministry of Transport and Communications

¹⁸ GOK, Ministry of Roads and Public Works *GOK/SIDA Roads 2000 Programme, Nyanza Roads Maintenance Programme 2004*

¹⁹ GOK (2004) Recommendations on Integrated National Transport Policy: *Moving A Working Nation*. Ministry of Transport and Communications

²⁰ Torfs M E., Mobile health care services in developing countries. *Public Health Reviews*, 1980; 9[1-2]: 93-112

²¹ GOK, Ministry of Roads and Public Works *GOK/SIDA Roads 2000 Programme, Nyanza Roads Maintenance Programme 2004*

Table 3: Goods transported and the mode of transport used in Western Kenya

Goods Transported	Main Mode of Transport
Water	Head loading
	Wheelbarrows
	Bicycles
Firewood (For domestic Use)	Head loading
Firewood (For Sale)	Head loading
	Handcart
Agricultural Produce From Fields	Head loading
	Wheelbarrows
Agricultural Produce to local market Centre	Head loading
	Matatu
	Wheelbarrows
Agricultural produce to <i>posho</i> mills	Head loading
	Bicycles

Source: Maganya J (1996) *Needs assessment for non-motorized transport in Western Kenya*. IT-Kenya's Rural Transport Programme (Unpublished)

As the table above shows mobility is an important human asset for improvement of livelihoods through access to goods and services. People need to get fuel wood, go to work, fetch water participate in trade and commerce and reach schools and health institutions. For sick people lack of transport can have detrimental effects on lives. In order to save the lives of pregnant women it is important to reduce delays in accessing health care²².

Access to health is complicated by distant health institutions. For example, in Mpongwe District, Zambia, patients travel as far as 60 kilometers on a canoe to a health centre. For medical emergencies, the only reliable means of transport are bicycles, canoes and ox-carts. In situations where there was no ox-cart and it is not possible to use canoes or bicycles, the people have to travel long distances on foot carrying their sick relatives²³.

In another study in western Kenya, a total of 64 women (27%) never attended on Ante Natal Care (ANC) because of expenses of transport or the cost of the ANC. Moreover, 49% never attended a health facility to deliver because of lack of means of transport, in particular at night (49%). The study conclude that although the perceived expense of the ANC may hinder attendance, it was uncertain that free antenatal care would increase coverage substantially because transport costs, physical inability to travel long distances, and perceived poor quality of care would remain barriers²⁴. In yet another study that looked at formal and informal charges of health care in Kenya, the majority (76.8 percent) of exit interview clients incurred transportation costs to reach an ANC facility, the Kenyan focus groups, most participants reported walking to ANC facilities for services; however, most clients seeking care at District Hospitals incurred transportation

²² Rosenfield A, Maine D. Maternal mortality—a neglected tragedy: where is the M in MCH? *Lancet* 1985; 2:83-5

²³ John Alwar, Velep Mtonga, Bonwell Sikatoye Report of the Summative Evaluation of the Essential Obstetric Care Project In Mpongwe, Masaiti and Lufwanyama, UNICEF Zambia Country Office, 2000

²⁴ Ilse E Blokland¹, Daniel H Rosen³, Kubaje Adazu², Laurence Slutsker⁴ and

Kim A Lindblade⁴ Use of antenatal services and delivery care among women in rural western Kenya: a community based survey. *Reproductive Health* 2006, 3:2 doi:10.1186/1742-4755-3-2

costs ranging from US\$0.26 to US\$0.52²⁵. Lack of transport to access health in some cases contributes to death. The table below from a study carried out in South Africa indicates the various causes of death of newborn infants in rural areas. In this case lack of transport causes more deaths than lack of access to neonatal ICU bed with ventilator, poor progress in labor and/or incorrect use of a partogram, delay in medical personnel calling for expert assistance and inadequate neonatal management plan.

Table 4: The Top Ten Modifiable Factors In Deaths of Newborn Infants in Rural Areas

Description	Number	% of total deaths
Inadequate facilities/equipment in neonatal unit/ nursery	44	4.0
No or poor antenatal care	39	3.5
Poor intrapartum foetal monitoring	35	3.2
Patient delay in seeking medical attention during labour	27	2.4
Prolonged 2nd stage with no intervention	16	1.4
Inappropriate response to rupture of membranes	13	1.2
Lack of home to institution transport	13	1.2
No accessible neonatal ICU bed with ventilator	10	0.9
Poor progress in labour and partogram not used correctly	10	0.9
Delay in medical personnel calling for expert assistance	9	0.8
Neonatal management plan inadequate	9	0.8

Source: Pattinson Robert et al. Improving survival rates of newborn infants in South Africa *Reproductive Health* 2005, 2:4 doi: 10.1186/1742-4755-2-4

1.4 Access to Healthcare

The three fundamental functions of a health system are to improve the health of the population, respond to people's expectations, and provide financial protection against the costs of ill-health²⁶. Access to healthcare has multiple definitions, and its meaning in a given context is too often assumed²⁷. The primary problem being that access refers to the potential to use services and also physical use of the services, therefore improving access to health can mean the dimension of creating facilities that can be used. However if we think of access in two stages which are 'potential' for care delivery, followed by 'realized' delivery of care, potential exists when a needy population coexists in space and time with a willing and able healthcare delivery system while realized care follows when all barriers to provision are overcome²⁸. An inherent difficulty is that access is both a noun referring to potential for healthcare use, and also a verb referring to the act of using or receiving healthcare. More research is needed to deconstruct the implication of the above for access to healthcare systems in various contexts.

²⁵ Suneeta Sharma et al (2005), Formal And Informal, Fees For Maternal, Health Care, Services In Five Countries: *Policies, Practices, and Perspectives. Policy Working Paper Series No. 16 USAID*

²⁶ World Health Organization, *The World Health Report 2000 – Health systems: improving performance*. Geneva: World Health Organization; 2000

²⁷ Khan AA, Bhardwaj SM. Access to health care: A conceptual framework and its relevance to health care planning. *Eval Health Prof*. 1994;17:60–76

²⁸ Penchansky and Thomas [22. Penchansky R, Thomas JW: The Concept of Access. *Med Care* 1981, 19(2):127-140] have usefully grouped barriers into five dimensions: availability, accessibility, affordability, acceptability and accommodation

In the medical planning and policies in Kenya ‘access’ is used mainly as a noun to denote potential for healthcare use. Examples of use of access in health planning in Kenya include the National Social Health Insurance Strategy which states in its rationale for existence that the performance of the health sector is affected by high cost of healthcare contributing to poor *access* and declining standards²⁹. In the adolescent and reproductive health and development policy there is recognition that *access* to and utilization of youth-friendly services will consume a large portion of the total resource requirements³⁰. The National Malaria Strategy also refers to *access* many times, the references are found in the strategic approaches which guarantees all people quick *access* and effective treatment to significantly reduce illness and death from malaria; *Access* to medicines is also used to describe how anaemia in pregnancy will be reduced; *access* to treated mosquito nets is used as part of the vector control strategy³¹.

The Kenyan PRSP also uses the term *access* to define how health services will be availed to all people and recognizes the inability by a majority of Kenyans to afford and access medical care and health facilities³². In all these instances access is used as a noun. Access however should refer to the extent to which an appropriate package of services can be obtained by individuals in a given location³³. Access has several dimensions, including geographic, economic, administrative, cognitive, and psychosocial and amongst this is the transport aspect of access is implicit and thus easily lost in medical service provision planning.

According to the World Health Organization (WHO) very few PRSPs discuss the barriers that prevent poor women from accessing reproductive care – for example, distance, cost, cultural practices, health issues are discussed almost exclusively in the section on health, despite the obvious links with other sectors such as transport and the environment³⁴. In resource allocation there is importance to ensure that resources are available for complementary investments in other sectors that contribute to improved health outcomes, for example investments in transport infrastructure may be required to improve access to health services³⁵.

Despite all these, the achievement of the “social goal of equitable access” to health care has proved difficult for most developing countries and the availability of

²⁹ Government of Kenya (2003) National Social Health Insurance Strategy, Ministry Of Health

³⁰ GOK (2005), Adolescent Reproductive Health and Development Policy Plan of Action 2005–2015 Adolescent Division of Reproductive Health Ministry of Health

³¹ GOK (2001) National Malaria Strategy 2001–2010 an introduction. Division of Malaria Control Ministry of Health

³² Government of Kenya, *Economic Recovery Strategy for Wealth and Employment Creation: 2003-2007* (ERSP) (Nairobi: GoK, 2003)

³³ Bertrand, J., K. Hardee, R Magnani, and M. Angle. 1995 “Access, Quality and Medical Barriers in Family Planning Programs.” *International Family Planning Perspective* 21(2): 64-74

³⁴ World Health Organization (2004) PRSPs: Their Significance for Health: second synthesis report, WHO Document Production Services, Geneva, Switzerland

³⁵ Gareth Williams and Roger Hay (2005) High Level Forum on the Health Millennium Development Goals Selected Papers 2003–2005: Fiscal Space and Sustainability from the Perspective of the Health sector

health facilities in rural areas is a major concern³⁶. While the distinction between availability and accessibility can be useful, in the context of urban areas, where multiple service locations are common, the two dimensions, which constitute spatial accessibility, should be considered simultaneously in a rural area³⁷. Lack of access to health disproportionately affects women and children. The World Health Organization (WHO) has found out that the ANC system in developing countries has been adapted from developed countries without formal evaluations of the impact of interventions in developing country settings³⁸. In 2000, it was estimated that approximately 529 000 women in developing countries died from complications related to pregnancy or delivery³⁹. In many developing countries, the majority of births occur without the help of a skilled assistant (defined as a midwife, nurse trained as midwife, or a doctor) at home⁴⁰. Home deliveries in the absence of skilled professional attendants have been associated with adverse infant and maternal outcome⁴¹. However, home deliveries without a skilled attendant are chosen or occur for a variety of reasons, including long distances or difficult access to a birth facility, costs of services and perceived lack of quality of care in a health facility⁴². During a malaria education day by Akado Medical Centre in Suba the District Malaria Control Officer said that in Mbita, many of the most vulnerable people live too far from any clinic. “Pregnant women and children under five years old are at greatest risk and they find it even harder to reach treatment centers”⁴³. With this scenario in mind achievement of MDG5 “Improve maternal health” and with that the reduction of women’s death in pregnancy and childbirth is put in peril.

One attempt to pilot improved access to health services was undertaken in the mid 90’s by Intermediate Technology Development Group (ITDG) Kenya’s Rural Transport Programme (Maganya, 1996). Activities that were undertaken involved the dissemination of IMTs and improvement of non motorized transport services in rural areas in western Kenya. It was found that the main advantage of IMTs was that they matched closely the use and management abilities of the owners, who tend to be poor. Their manufacture was also tailored to the users needs and because of ability to be decentralized they are within the reach of many local populations. The benefits accrued from these IMTs included improved methods of transporting sick people from health

³⁶ Noorali R., Luby S., Rahbar M H., Does use of a government service depend on distance from the health facility? *Health Policy and Planning*, 1999; 14 [2]: 191-197

³⁷ Guagliardo, MF.;Ronzio, CR.;Cheung, I.;Chacko, E.; Joseph, JG. Physician accessibility: An urban case study of pediatric primary care. *Health and Place* 2004

³⁸ World Health Organization, UNICEF: Antenatal care in developing countries. Promises, achievements and missed opportunities. An analysis of trends, levels and differentials, 1990–2001 Geneva, Switzerland; 2003

³⁹ World Health Organization, UNICEF, UNFPA: Maternal mortality in 2000: estimates developed by WHO, UNICEF and UNFPA. Geneva, Switzerland; 2004

⁴⁰ World Health Organization (1996), Department of Reproductive Health and Research: Coverage of maternity care: a listing of available information. 1996

⁴¹ De Brouwere V, Tonglet R, Van Lerberghe W: Strategies for reducing maternal mortality in developing countries: what can we learn from the history of the industrialized West? *Trop Med Int Health* 1998, 3:771-782

⁴² Mwaniki PK, Kabiru EW, Mbugua GG: Utilisation of antenatal and maternity services by mothers seeking child welfare services in Mbeere District, Eastern Province, Kenya. *East Afr Med J* 2002, 79:184-187

⁴³ Akado Medical Centre (2005). Malaria Education Day Report and Mosquito net Distribution in Mbita. Akado Medical Centre Mbita (unpublished)

institutions. In Ndhiwa area, located approximately 50 Km from Suba, there was an activity aimed at using bicycle pulled ambulances to access health institutions for members of the community who live far away from health institutions. The table below shows the use of bicycle ambulances between the months of March to September 1996 in various health centers and income accruing for the health institutions from the use of trailers. A single trailer was prefabricated at the cost of USD 71, which made the activity financially sustainable.

Table 5: Use of Bicycle Ambulances (Between March and September 1996)

Institution	Month acquired	Number of times used	Charge per trip (US c)	Total income (US \$)
Institute for Rural Development	March	9	35	3.13
Sori Nursing Home	March	90	87	78.26
Got Kojowi Clinic	June	0	-	-
Agenga Health Centre	May	0	-	-
Mirogi Catholic Health Centre	May	3	52	6.96

Source: Priyanthi F. and Keter S (1997) Evaluation IT-Kenya's Rural Transport Programme. ITDG (PracticalAction) Kenya, Nairobi (Unpublished)

Other examples of attempts to improve access to health in Africa include an example from Sierra Leone, where investment in a vehicle and an improved communication system led to a doubling of the utilization of emergency obstetric services and a 50% reduction in case fatalities⁴⁴. Ghana's Community-Based Health Planning and Services found that a single nurse on a motorbike or bicycle relocated to a village health center can outperform an entire sub-district health center, increasing the volume of health service encounters by eight times. At the Worcester Hospice in South Africa, workers on bicycles were able to cover three times the distance they did on foot, reaching 15 times more patients. And in Ghana, an education group called Youth Against AIDS now reaches 50 percent more project beneficiaries, while cutting the organization's transport costs in half⁴⁵. Health care in developing countries has not traditionally focused on emergency medical care and although health promotion and disease and injury prevention should be core values of any health system, many acute health problems will continue to occur. Therefore incorporation of a basic level of emergency medical care into health care systems could have a significant impact on the well-being of populations⁴⁶.

1.5 Economic Recovery Strategy, Transport and Health

The Kenyan Poverty Reduction Strategy Paper (PRSP) recognizes the inability by a majority of Kenyans to afford and access medical care and health facilities and the lack of access roads as a major contributor to increased poverty in the country.

⁴⁴ Samai O, Senegheh P. Facilitating emergency obstetrical care through transportation and communication, Bo, Sierra Leone. International Journal of Gynecology and Obstetrics 1997; 59 Suppl 2:S157-64

⁴⁵ Gauthier, Aimée Using Bicycles to Save Lives Sustainabletransport Winter 2004 Number 16. ITDP, NY NY

⁴⁶ -Bulletin of the World Health Organization 2002, 80 (11) Emergency medical care in developing countries: is it worthwhile? Junaid A. Razzak1 & Arthur L. Kellermann

There is also recognition of the importance of enhanced participation of the people in decision-making. However linkage between health and the poor is unsatisfactory. According to Andrew Cassels;

For the most part, PRSPs appear to draw on existing national health strategies, without examining their effectiveness or their ability to reach the poor. In addition, while paying lip service to links with the Millennium Development Goals MDGs, few PRSPs capitalize on the opportunity presented by a cross-sectoral planning process to promote the achievement of health and human development outcomes through non-human development inputs such as transport, fiscal policy (e.g. tobacco taxes) and household energy. Instead, PRSPs tend to rely on the delivery of traditional health services, providing few pointers to the most essential areas of policy and institutional reform needed to achieve the MDGs⁴⁷.

Poverty and ill health are related through a cause-effect vicious cycle. Poverty causes people to live in environments that make them prone to illness and due to poor nutrition their bodies are unable to fend off infections making them vulnerable to infections. Infections limit the ability of sick people to generate income and work productively. In Kenya, out-of-pocket expenditure account for 53% of the total cost of healthcare in the country; this high level of out-of pocket financing of health care, which includes cost-sharing and fundraising increase poverty⁴⁸. Studies have shown that a large share of public spending in Kenya has also been devoted to urban hospitals, and this further limit the scope for expanding services into largely underserved rural areas⁴⁹.

In a World Bank/WHO publication, “*Dying for Change*” which gathered the views of 60,000 poor people across the globe stressed that health care services are vital for survival and livelihood. However, the significance that the poor attach to health services is muted by their widespread disappointment at the bad quality of service and the difficulties of accessing care. Typically, health services are scarce in the areas where poor people live, forcing them to travel long distances to seek care, poor roads and high transport costs can make this difficult, expensive and time consuming⁵⁰.

The Kenyan Economic Recovery Strategy (ERS) has three objectives of Economic growth, poverty reduction and good governance. Poverty is defined in income and non income terms which includes health and nutrition. Health is identified a non income dimension of poverty. The health strategy addresses needs of poor through health systems reform while there is also an a government commitment to increase health spending from 5.6% to 12% of the total public expenditure to improve intersectoral cooperation and focus health investments on the needs of the poor.

⁴⁷ Cassels, Andrew (2004) High Level Forum on the Health Millennium Development Goals Selected Papers 2003–2005: Resources, Aid Effectiveness and Harmonization. WHO Geneva

⁴⁸ GOK (2003) National Social Health Insurance Strategy, Ministry Of Health

⁴⁹ Collins DH., Quick JD., Musau SN., Kraushaar DL., Health financing reform in Kenya: The fall and rise of cost sharing. Stubbs Monograph Series No1. *Management Sciences for Health*, 1996

⁵⁰ World Bank (2001) *Dying for change: Poor people's experience of health and ill-health*. World Bank, Washington DC

2.1 Methods of Study

The study reported here was carried out in Suba, one of poorest districts in Kenya's Nyanza Province where reproductive health, maternal and child health are major issues of concern. The study's objectives were to create an understanding of the linkages between mobility and health, provide tangible benefits to local communities, document findings of the relationship between mobility/access and health, and contribute to Kenya's efforts towards achieving the millennium development goals.

To undertake the research the methodology used in the study comprised of the review of relevant literature and resources followed by a participatory appraisal of key respondents, who are stakeholders in the transport and health sector in Suba District. The key tools used in this exploratory study are borrowed from Participatory Rural Appraisal (PRA) toolkits, these included: (1) Focus Group Discussions (FGD), (2) discussions around an annual calendar and diurnal calendar, and (3) assessment of needs and ranking of priorities.

Jeff Maganya, the Principal Researcher, lead a team of female and male Field Assistants from the locality carry out the fieldwork during December-January 2006. This was during *opon* or the short rainy season, and as expected, water borne diseases are relatively more prevalent and transportation difficulties more pronounced, especially as it is also holiday season when students and migrants travel back home for family reunions. Areas covered during fieldwork and the numbers of men and women who were randomly selected and participated in the study as respondents/informants are tabulated below (Table 6).

The groups that participated were carefully selected to be representative sample of the people and the transport needs realities of Suba. The samples were selected based on the following transport impediments that exist in Suba.

- a. Long walking distances to goods and service centers: the groups that were representative of this reality were found at Nyatoto Primary Schools area, Obambo Primary School area, Gingo Primary Schools area, and Tetre Youth Group;
- b. Mountainous areas: The groups that were representative of these areas were from Tonga Primary School Area and Sindo Primary School area;
- c. Island conditions: The groups that were representative of island conditions included groups from Sena Primary School area,

- Kamsengre Primary School area, and Tom Mboya High School area; and
- d. Groups that are close to service centers: These groups included the ones that met at Mbita Township and Sindo Market.

Table 6: Locations Visited and Numbers of Respondents/Informants

<i>Location/Meeting Place</i>	<i>Numbers of men in discussions group</i>	<i>Numbers of women in discussions group</i>	<i>Total</i>
Gembe Location	25	15	40
Obambo Primary School			
Kaksingri East Location	17	31	48
Gingo Primary School			
Gembe Location	17	22	39
Tetre Youth Group			
Ruma Location	21	21	42
Nyatoto Primary School			
Wakianga/ Waware Locations	18	23	41
Sena Primary School			
Kamasengre Location	13	20	33
Kamasengre Primary School			
Kaswanga Location	20	18	38
Tom Mboya High School			
Kaksingri East, Location	15	14	29
Sindo Primary School			
Gwasssi West Location	10	23	33
Tonga Primary School			
Mbita Township	16	25	41
Mbita's Hotel			
Total	172	212	389

Source: Fieldwork

During meetings, and when appropriate, the group was separated into male and female groups and the Focus Group Discussions were made easy by separation of the large groups into smaller groups of 5-10 people each. This was done to create a permissive, non-threatening environment.

During the groups meetings there were opportunities to undertake quantitative data collection. The sub group leaders were “trained on the questions to be asked” and they administered the questions to individual group members and this created a basis for development of opinions and triangulating the results from the different groups.

In analysis the data we used the following principles

- 1. Phenomenological analysis of Focus Group Discussion results.** Individual statements created meaning units, transforming to clusters of meanings and later removing overlapping and repetitive statements;
- 2. Triangulation.** Because of the multiple sources of data we used triangulation to provide rigor to the study. Triangulation in this study was not used as a form of validation, but to address rigor, breadth, and depth to the study; we also used our triangulation as a means to neutralize inherent bias in data sources.

3. **Validity.** Validity within this study is based on the believability of participants’.
4. **Generalizability.** While qualitative research such as this one cannot offer generalizability of its results, in the same breath as quantitative surveys. Our survey undertook to provide enough information to reasonably judge the similarity of results in one setting with findings in another locale.
5. **Quantitative analysis.** While quantitative analysis is not a routine part of qualitative research; however, we gave it a place in the reporting of focus group interviews. Limited qualitative data are included in this study.

3.1 Common Diseases and Transport Needs

There are many diseases that afflict the people of Suba (e.g. malaria, pediatric diseases, coughs and chest diseases, stomach aches, pregnancy complications, menstruation and associated complications, etc., refer to Table 7). These have varying transport needs. In general the more severe an ailment is the more it tends to need transportation arising from the need to seek medical attention at health facilities beyond the village. Health-related transport needs, be they within the village or to healthcare institutions, affect the sustenance and livelihood related transport tasks that household members especially women undertake.

3.1.1 Common Diseases

All the groups in the different areas went through a task of stating all the diseases/symptoms that they had known to exist in the various localities that they lived in currently. The difference between disease and symptom in the local language does not exist, and therefore they are treated as the same thing for the purposes of this study. Also loosely grouped together as “diseases/symptoms” are various problems that tend to require medical (traditional or non traditional) attention. The diseases/symptoms were then categorized into three groups of very common, common and rare. This categorization was done through consensus in the FGDs and where consensus failed a vote was undertaken to categorize each disease/symptom. A total of 47 diseases/symptoms were mentioned to exist in Suba and out of those 27.6% are very common, 23.4% are common and 46.8% are rare. Of the common diseases/symptoms five of the diseases/symptoms i.e. pregnancy, need for contraception, excessive bleeding and pain during menstruation, children’s diseases and child birth affected and/or impacted women in their reproductive roles as well as in their role as care givers. This shifted the burden of care and transport for health disproportionately to women. Most women also said that when a man is sick they have to be taken care of by the women, while when a woman is sick, they take care of themselves.

“When my husband is mildly sick, I become his personal servant, when I am sick, unless I am dying or visibly very ill, I have to continue with my duties as a wife, including taking care of him”

An elderly woman from Kaksingri Location

The domestic transport burden, which is borne by women, increases when there is a sick person in the household, as this means more intensive care of patients with more demand on the already busy schedule of women. The direct tasks include bringing bathing water at home (during the dry season fetching 20 liters of water in Gingo area may take up to 1 hr), walking to market and other health care providers to purchase and bring medicines or health workers.

The table below indicates the diseases/symptoms that are found in Suba and the frequency of occurrence of the diseases.

Table 7: Table of diseases/symptoms and the frequency of their occurrence

Disease	Commonness of Condition
Stomach aches	Very common
Pregnancy (and associated problems)	Very Common
Need for contraception	Very Common
Menstruation (and associated problems)	Very common
Marijuana addiction	Very Common
Malaria	Very Common
Hunger	Very Common
Death	Very Common
Coughs and chest diseases	Very Common
Children's Diseases (Measles, Colic pains)	Very Common
Child birth	Very Common
AIDS	Very Common
Addictions (Alcohol)	Very Common
Wounds	Common
Witchcraft related illness	Common
Vomiting	Common
Sexually Transmitted Disease (STDs)	Common
Skin diseases	Common
Scabies	Common
Miscarriage/Abortion	Common
Jiggers	Common
Insect bites and stings (bees)	Common
Dental aches	Common
Chicken Pox	Common
Tetanus	Rare
Suicide attempts	Rare
Speech disorders	Rare
Snake bites	Rare
Rape and sexual assault/defilement	Rare
Poisoning	Rare
Neck pain	Rare
Mental disorders	Rare
Epilepsy	Rare
Ear Pains	Rare
Drowning	Rare
Disabilities (Physical)	Rare
Diabetes	Rare
Deafness	Rare
Coma/unconsciousness	Rare
Chocking, throat and swallowing problems	Rare
Burns	Rare
Blindness and eye diseases	Rare
Bleeding (Other than from accident)	Rare
Asthma	Rare
Arthritis and bone aches and backaches	Rare
Accidents	Rare
Cholera	(Other) Seasonal

Source: Fieldwork

3.1.2 Transport Demands for Common Diseases

Various ailments in Suba require transportation at different periods. This may be influenced by the severity of the illness and/or ability of the patient to walk. In the group discussions severities of the diseases were categorized into mild moderate and severe. Based on this classification their need for transport was assessed and agreed on through consensus or voting.

Accessibility conditions (e.g. distance and terrain) are major influences on health related transport demand or need. In Locations such as Gembe, Kaksingri, and Ruma where distances to health facilities are relatively long, access to health facilities on foot – the commonest mode of personal transport – is more circumscribed even under "moderate" to "severe" conditions. Access is further limited by additional complicating circumstances in a place like Ruma where the presence of wildlife in the adjacent National Park restricts movement. Women with children are more vulnerable and provision of some form of motorized transport would be appropriate.

In mountainous areas notably Kaksingri East and Gwasssi West Locations, the groups (25 men and 37 women) discussed difficulties in physically accessing health services due to prevailing topographical conditions. Preference for use of certain types of NMTs (e.g. the bicycle) in such areas was noticeably low, perhaps and indication of need for more appropriate modes of transport and/or better location of health facilities and/or health service delivery system.

The above provides only anecdotal evidence of factors that define accessibility to health care in the study area since there are multiple layers of influences that defy any simple analysis. While transport (mobility) is the focus of this study, the play of other factors including income, information, and the quality of health services should not be underestimated. The complexity of the relationship between the various variables, especially the nature of causation, makes the current study exploratory at best.

To give an example, isle communities of Kamasengre and Wakianga/Waware Locations have to rely on water transport (boats) for part of the journey to health facilities. Because of the scarcity of this mode of transport and competing use of boats for fishing, severity of disease is but a partial factor in the mobility and health equation and therefore analysis of 'composite' factors would be more enlightening.

3.1.2.1 Transport Needs for Very Common Diseases

In severe conditions all very common diseases except one require transport to health institutions. In moderate conditions only two do not require transport. In mild conditions six of the 13 very common diseases require transport to health

institutions. Transport needs for very common diseases/symptoms are tabulated below.

Table 8: Transport needs for very common diseases/symptoms

Disease/Symptom	Mild condition	Moderate condition	Severe condition
Marijuana addiction	Does not need transport	Does not need transport	Does not need transport
Addictions (Alcohol)	Does not need transport	Does not need transport	Needs Transport
Coughs and chest diseases including TB	Does not need transport	Needs Transport	Needs Transport
Hunger	Does not need transport	Needs Transport	Needs Transport
Malaria	Does not need transport	Needs Transport	Needs Transport
Stomach aches	Does not need transport	Needs Transport	Needs Transport
AIDS	Needs Transport	Needs Transport	Needs Transport
Child birth	Needs Transport	Needs Transport	Needs Transport
Children's Diseases (Measles, Colic pains)	Needs Transport	Needs Transport	Needs Transport
Death	Needs Transport	Needs Transport	Needs Transport
Menstruation (and associated problems)	Does not need transport	Does not need transport	Needs Transport
Need for contraception	Needs Transport	Needs Transport	Needs Transport
Pregnancy	Does not need transport	Needs Transport	Needs Transport

Source: Fieldwork

From Table 8 above AIDS, child birth, pediatric cases, need for contraception and death are the diseases or conditions wherein transport is needed at all levels of severity. Although not tested this could be linked to the value system and importance people attach to certain health conditions. Increasing awareness of birth control measures (as well as AIDS), and safeguard against unwanted pregnancy, for example, plausibly explain why contraception always needs transport. The strong burial customs of the Luo and Luo Abasuba means that the dead have to be transported to their home for burial. Hence the continual demand for transport. Early pregnancy may not require transport as mothers, particularly younger ones who may not have complications may not attend prenatal clinic. But, child bearing always does need some form of transport, especially where the travel distance or effort required to get to a health facilities is significant.

3.1.2.2 Transport Needs for Common Diseases

In severe condition all, except one of the eleven diseases/symptoms need transportation to health intuitions. In moderate conditions 5 of the 11 diseases/symptoms require transportation. In mild conditions only two out of the 11 conditions require transportation to health institutions.

Transport needs for common diseases/symptoms are tabulated below (Table 9)

Table 9: Table of transport needs for common diseases/symptoms

Disease	Mild Condition	Moderate Condition	Severe Condition
Scabies	Does not need transport	Does not need transport	Does not need transport
Skin diseases	Does not need transport	Does not need transport	Does not need transport
Dental aches	Does not need transport	Does not need transport	Needs Transport
Jiggers	Does not need transport	Does not need transport	Needs Transport
STDs	Does not need transport	Does not need transport	Needs Transport
Wounds	Does not need transport	Does not need transport	Needs Transport
Insect bites and stings (bees)	Does not need transport	Needs Transport	Needs Transport
Vomiting	Does not need transport	Needs Transport	Needs Transport
Witchcraft related illness	Does not need transport	Needs Transport	Needs Transport
Chicken Pox	Needs Transport	Needs Transport	Needs Transport
Miscarriage/Abortion	Needs Transport	Needs Transport	Needs Transport

Source: Fieldwork

3.1.2.3 Transport Needs for Rare and Seasonal Diseases

Of all 23 severe conditions of rare diseases, three do not need transportation to health services. In mild conditions eight diseases do not need transportation to health institutions. In mild conditions 14 of the 23 rare diseases do not need transport to health institutions.

The transport needs for rare and seasonal diseases are tabulated below (Table 10).

3.1.2.4 Severity of Condition and Need for Transport

While 87% of all ailments in severe condition require transport to health institutions, only 34% of mild conditions require transport. This is due to the fact that self medication, including drinking water, massages and purchase of over the counter medication is the common interventions for mild illnesses. There is never any perceived need to seek medical (traditional or non traditional) intervention for mild illness. The need for external intervention usually starts when one gets moderately ill or when one is severely ill. Usually pain or other symptoms such as bleeding are contributory factors.

The mild conditions of diseases/symptoms that require transport also falls into the following categories.

Table 10: Table of transport needs for rare diseases/symptoms

Disease/Symptom	Mild condition	Moderate condition	Severe Condition
Blindness and eye diseases	Does not need transport	Does not need transport	Does not need transport
Deafness	Does not need transport	Does not need transport	Does not need transport
Speech disorders	Does not need transport	Does not need transport	Does not need transport
Asthma	Does not need transport	Does not need transport	Needs Transport
Bleeding (Other than from accident)	Does not need transport	Does not need transport	Needs Transport
Neck pain	Does not need transport	Does not need transport	Needs Transport
Rape and sexual assault/defilement	Does not need transport	Does not need transport	Needs Transport
Suicide attempts	Does not need transport	Does not need transport	Needs Transport
Accidents	Does not need transport	Needs Transport	Needs Transport
Burns	Does not need transport	Needs Transport	Needs Transport
Choking, throat and swallowing problems	Does not need transport	Needs Transport	Needs Transport
Diabetes	Does not need transport	Needs Transport	Needs Transport
Mental disorders	Does not need transport	Needs Transport	Needs Transport
Poisoning	Does not need transport	Needs Transport	Needs Transport
Arthritis and bone aches and backaches	Needs Transport	Needs Transport	Needs Transport
Coma/unconsciousness	Needs Transport	Needs Transport	Needs Transport
Disabilities (Physical)	Needs Transport	Needs Transport	Needs Transport
Drowning	Needs Transport	Needs Transport	Needs Transport
Ear Pains	Needs Transport	Needs Transport	Needs Transport
Epilepsy	Needs Transport	Needs Transport	Needs Transport
Snake bites	Needs Transport	Needs Transport	Needs Transport
Tetanus	Needs Transport	Needs Transport	Needs Transport
Cholera	Needs Transport	Needs Transport	Needs Transport

Source: Fieldwork

- Diseases affecting children since the relatively young ones are normally carried by their mothers. This is particularly the case for people who walk long distances (e.g. those who live in parts of Gembe Location and Kaksingri East Location). The situation is different for mothers who live closer to health service delivery points (e.g. Mbita Township and Sindo Market);
- Accidents and diseases with unpredictable prognosis such as miscarriage/abortion, coma/unconsciousness, drowning, epilepsy, snake bites, tetanus AIDS, cholera, child birth complications or ear pains;
- Services that may not have local alternatives e.g. death (preservation of a body) and need for contraception; and
- Diseases that affect ability to walk e.g. Arthritis, bone aches and backaches and physical disabilities. This was mentioned particularly during group discussions at Gingo Primary School and Tonga Primary School in

Kaksingri East Location and Gwasssi West Location respectively. These are the mountainous areas.

3.1.3 Factors Affecting Availability of Transport to Health Services

Transportation for health assistance is largely dependent on walking and private/public transport services availability. The ownership of motorized vehicles is very low in the whole district and thus all the burden of reaching primary care and referral is undertaken by the use of available transport services, i.e., NMTs including boats.

The availability of transport services and trips to health institutions are affected by the following:

1. Season of the year;
2. Time of the day;
3. Availability of boats to be used for free/ability to pay; and
4. Availability of local alternative health services.

3.1.3.1 Season of the Year

The season of the year affects transport and access to health institutions because of rains. All the roads in the district have earth or gravel surface and are easily damaged by erosion and surface pools. The rains damage sections of most the roads in the districts making most of the roads impassable by motorized transport. This limits the presence of motorized transport services. There are four major roads that have frequent and dependable transport services. These are the Homa Bay-Magunga Road, Homa Bay-Mbita Road, Mbita-Sindo Road and Mbita-Lwanda-Kisumu road through a ferry across the lake. Tabulated below are typical characteristics of the roads mentioned above vis-à-vis transport services.

Table 11: Typical characteristics of roads vis-à-vis transport services

Road	Typical Transport service vehicle	Typical Fare	Availability in rainy season
Homa Bay-Magunga Road	Mini-Lorries used as passenger vehicles	Kshs200 (US\$3.00) (Homa Bay-Magunga)	No service after every major rain (Most sick people have to use Health Facilities In Magunga or walk to Karungu (20Kms away) or to main Sindo Homa Bay road (25 Km away to get to the district hospital in Homa Bay or the Sub District Hospital in Sindo)
Homa Bay-Mbita Road	Mini-Lorries used as passenger vehicles	Kshs150 (US\$2.30) (Mbita-Homa Bay)	Trips are present but are unpredictable and can take up to 12 hours when there is a fish carrying truck stuck in mud.
Mbita-Sindo Road	Toyota Sedan Used as Passenger vehicles	Kshs100 (US\$1.50) (Sindo-Mbita)	Unpredictable depending of rains. Most of the vehicles have to wait until the roads dry up from previous rains before they venture into the service.
Mbita-Lwanda-Kisumu	Use of passenger carrying ferry to Lwanda Kotieno Market and then take Mini-Lorries used as passenger vehicles to Kisumu.	Kshs300 (US\$4.6)	The Lwanda Kotieno-Kisumu road is unpredictable and vehicles have to wait until the roads dry up from previous rains before they venture into the service.

Source: Field work

Rain is an important variable in the mobility-health equation. Combined with terrain, soil conditions and the maintenance regime, then you get the typical conditions in Suba District described in the far right column of Table 11 above. Most roads are impassable after rains, especially the long ones that fall in March and April. Areas around Gwasssi Hills and Kaksingri East Location that receive upward of 1000mm of rainfall, not only is the Lwanda Kotieno_Kisumu Road rendered impassable during part of the year, but fares are also relatively higher. This makes it more difficult to physically access health services worsening epidemiological conditions when demand for malaria treatment, for example, peaks. Travel conditions are marginally better in the other areas (i.e. in study area type A, C and D). Of the latter, communities who live close to service centers (i.e. Mbita Township and Sindo Market) are relatively better off since water transport during rainy seasons is often unreliable.

3.1.3.2 Time of the Day

The rains in Suba fall mainly in the afternoons and this limits travel in the afternoon by foot. The heavy tropical rains also create rough lake waters that limit the use of boats when it is raining. The following morning after it rains motorized transport services on land are affected as sections of the roads become impassable because they are muddy, flooded or eroded away. The trips made by small boats in the lake are also affected by strong lake breeze that may start as early as noon.

3.1.3.3 Availability of Boats for Free Use/Ability to Pay

There exists a tradition amongst communities that live near the lake of borrowing boats for use in emergencies. This practice is perhaps a reflection of peoples' inability to pay or simply the compassion and generosity that often accompanies communal life. Nonetheless most boats are primarily for the purpose of fishing, and so are physically unavailable for any other purpose when in use by fishermen. Fishing for Nile Perch takes place between 17.00 hrs in the afternoon to 9.00 hrs the following morning. Sometimes during the day the boats may be used for day time fishing. When this happens the boats are unavailable for use as ambulances when needed.

3.1.3.4 Availability of Local Health Services

There is availability of local health service providers, which include Community Health Workers (CHW) (Trained and Untrained), Traditional Birth Attendants (TBA) (formally trained or traditional ones who have learnt through apprenticeship) and unregistered medical practitioners. Other services include illegal prescription medicine dispensers, over the counter dispensers of medicines, traditional herbalists and witchdoctors. All these services may be used as primary health service provision but when there is no transport to formal health centers and institutions local people have no choice but to use these services with the attendant risks mainly because of lack of regulations, standards and in some cases ignorance of the effects of what they are dispensing.

There are two types of formal health service providers in the study area—Government Health Centre and a Mission Health Center. Both have qualified nurses and Medical Officer of Health, are equipped with basic diagnostic and treatment facilities and therefore provide good quality entry-level health services with complicated cases referred to Homa Bay District Hospital or Kisumu Provincial Hospital.

In the absence of actual distances, it is possible to extrapolate a measure of 'nearness' and 'effort' based on the time it takes (men) to travel on foot from various study area sites to a health facility (Government or Mission). As Table 13 shows, it takes almost three times the average time to reach a health facility on foot from Ruma Nyando; twice the average time from Wakula Location; and 1½ the average time from Gembe Location and Kaksingri East (Gingo) Location. The other study areas, namely Wakianga/Waware Location, Kaswanga Location, Gwasssi West Location, Mbita Township and Kaksingri East (Sindo) are relatively closer with average travel time between two and 10 minutes respectively (i.e., Wakianga/Waware and Kaswanga nearest and Sindo the furthest).

3.1.4 Cost of Transport to and From Health Institutions

Transport cost to health institutions is higher than most people can afford. The cost of taking care of sick people including transportation costs can consume most household savings, mostly in terms of grains or livestock.

3.1.4.1 Household Savings and Incomes

The savings that many people in this community have is grain (replenished annually) and cattle (inherited from parents or acquired when a daughter or sister is married). Cash savings are limited. Most households have few cattle because of the tsetse flies that cause cattle deaths in the district. Also, it is not common for the resource poor farmers in the study area to have excess grain that would represent savings with the exception of unusually good seasons. Rather, most of the grain is kept for food and not for sale. However, when there is an emergency they are sold at very low prices to middle men who store the grain and later sell it to the same people at exorbitant prices. E.g. at harvest a tin of maize goes for Ksh10-15 (US\$0.15-0.23) while four months later it may sell for Ksh50 (US\$0.75).

Most of the cash income for women comes from fish related trade, small vendors, sale of alcohol and agricultural labor. Men process sisal, undertake fish related income generating activities, agricultural labor and income from work in urban areas⁵¹. Most of the daily work goes to daily sustenance and consumption.

⁵¹ There are a very large number of men who live in Homa Bay, Kisumu and Nairobi but have their wives in the rural areas.

Table 12 below shows the approximate 'savings'⁵² that homesteads have in Suba.

Table 12: Savings available in Suba homesteads

Location	Approx. Number of cattle per homestead	Approx. Total value of the cattle	Number of saved sacks of maize (after a good harvest) per homestead	Approx. total value of the grain
Gembe Location Obambo primary school	3	10-15,000	3	1500-2000
Wakianga/ Waware. Sena Primary School	7	50-60,000	9	4000-5000
Wakula. Wakula Primary School	6	40-50,000	10	4000-5000
Kamasengre Kamasengre Primary school	4	15-20,000	2	1000-1500
Kaswanga. Tom Mboya High school	3	10-15,000	3	1500-2000
Kaksingri East. Gingo Primary school	2	10-15,000	2	1000-1500
Kaksingri East, Sindo Primary school	2	15-20,000	3	2000-2500
Ruma Nyatoto Primary School	2	10-20,000	3	1500-2000
Gwasssi West Tonga primary School	5	40-50,000	7	2800-3500
Mbita Township (Mbita's Hotel)	1	10,000	3	2000-2500
Gembe Location Tetre youth Group	2	10-15,000	2	1500-2000

Source: Fieldwork

3.1.4.1 Transport of Sick People to Health Institutions

When one is sick enough to require medical attention outside the locality there are various considerations that are made by the family members. The most important consideration is the distance to the nearest primary health facility and the means of transport to reach there. Most cases of common cold are transported using public transport services in areas that services are available. Transport services however only stop at designated places along main roads and depending on the location of the patient, the vehicles may come full and thus unable to carry extra persons. But usually one has to walk varying distances to the main road, depending on how close one of to the road.

⁵² Most of the grain is kept for food and not for sale; however when there is an emergency they are sold at very low prices to middle men who store the grain and later sell it to the same people at exorbitant prices. E.g. at harvest a tin of maize goes for 10-15 Ksh while four months later it may sell for Ksh 50.

Below is Table 13 showing the estimated time it takes to reach health institutions from the various areas when one is walking. The time it takes to walk differs when as examples:

- Men are walking;
- When a pregnant woman is walking;
- For a woman with child birth complications who needs to be carried while lying on a stretcher;
- For a woman with a sick child carrying the child on her back.

Table 13: Estimated Time it takes to reach a health institution when walking (Minutes)

	Gembe Location	Wakianga/ Waware	Wakula	Kamasengre	Kaswanga	Kaksingri East, Gingo	Kaksingri East, Sindo	Ruma Nyatoto	Gwasssi West Tonga	Mbita Township	Average
Time it Takes to reach Government or Mission health centre (for men)	30	2	40	20	2	30	10	60	3	5	20.2
Time it Takes to reach Government or Mission health centre (for pregnant women)	45	5	45	30	2	40	10	90	5	20	29.2
Time it Takes to reach Government or Mission health centre (for women with child birth complications)	90	10	60	45	5	40	20	120	20	30	44
Time it Takes to reach Government or Mission health centre (for women with sick child)	45	10	45	30	2	30	30	90	5	20	30.7

Source: Fieldwork

When one gets too ill to walk, then there various imaginative ways that is used to transport the patient. Children are carried by women all the time as they are not heavy enough to require special stretchers or devices to carry them. However, men and women are carried using assortment of contraptions to the health institution or to the nearest place that a motorized transport vehicle may reach or be available. The following are ways in which sick people who are unable to walk are carried

- Use a bed a s stretcher and transported on foot (predominant in all Locations);
- Use of a boat (predominant in areas near the lake or island);
- Use of wheelbarrow (predominant in Mbita and Sindo Markets);
- Use of hired hand cart (predominant in Mbita and Sindo Markets);
- Hired vehicles (predominant in Mbita and Sindo Markets).

When there is a medical emergency most of the community members in Suba are usually found unprepared and have to depend on the community to help in physical transportation of a sick person or hold fundraising to hire a vehicle.

An old man in Gwasssi aptly describes the communal energies:

“When a person is bitten by a snake and the local healers have failed, he is put on a bed and between four to six young men transport him through the hills to Tonga Health centre or the Mission hospital”

Table 14 below shows the percentages of people who choose various options when there is need for emergency transport to a health institution.

Table 14: Percentages of people choosing various options when there is need for emergency transport to a health institution

	Gembe Location	Wakianga/Waware.	Wakula.	Kamasengre	Kaswanga.	Kaksingri East. Gingo	Kaksingri East, Sindo	Ruma Nyatoto	Gwasssi West Tonga	Mbita Township
Own savings to hire Vehicle	2%	0%	0%	0%	0%	0%	0%	0%	0%	3%
Own NMT ⁵³	5%	10%	15%	5%	3%	15%	10%	10%	14%	10%
Own motorized transport	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Communal fundraising and other support for transport	92%	90%	85%	95%	97%	85%	90%	90%	86%	87%
Total	100*	100	100	100	100	100	100	100	100	100

Source: Fieldwork

Note: * Rounded Figure

There are no significant modal choice differences between study areas or locations during emergencies (see Table 14). What is striking but not surprising is the absence of own motorized transport and the community effort to fundraise and other support for transport. With respect to people choosing own NMT for emergency transport to a health institution, Kaksingri East (Gingo) – mountainous area – and Wakula (long walking distances) have 15% apiece. In Gwasssi West (Tonga) – also a mountainous area – 14% of the respondents chose NMT while Wakianga/Waware Location (island conditions), Kaksingri East (Sindo) – mountainous – Ruma (long walking distance) and Mbita Township (close to service center) have each 10% of the respondent preferring own NMT.

It is clear from the above that distance or terrain is not the main factor explaining preference for own NMT as a mode of transport. Ownership, which is a function of income, is perhaps a more plausible explanation for the observed distribution.

3.1.4.1 Cost of Transport of Dead Persons from Hospital

Transport of the dead is very expensive and there are cases where many people have been left to die rather than seek medical treatment, because if they happen to die in health institution, that is far away from home the transport of the body to the may lead to exhausting savings to hire transport services. Other cases include situations where people are brought from health institutions to die at home to avoid the transport cost of the dead body. One of the key considerations that is made when one is severely sick and needs to be referred to a hospital in Homa Bay or Kisumu is transportation of the body back in case one dies. Since physicians will not provide a prognosis about the possibility of death - when there is a speck of a chance of life - of a case being referred, the decision to refer a critically sick person is normal the burden of close family members, who will pay for transport costs for the dead in case of death.

⁵³ May operate alone when they have to, but will still seek communal support first

Table 15 below shows the costs of transporting a dead person from Homa Bay District Hospital. It is clear from the table that there is no particular pattern between the cost of transporting a dead body from Homa Bay to the different study areas (i.e., long distance, mountainous, island and closer to center). This is due to the fact that the reference is Homa Bay Hospital and not the health service point.

Table 15: Cost of transporting a dead body from Homa Bay to different areas in Suba District

Location	Cost of transporting a dead body from Homa Bay (Kshs/US\$)
Gembe Location Obambo Primary school (L)	Kshs5,000-10,000 (\$77-154)
Kamasingre Kamasengre Primary School (I)	Kshs5,000-10,000 (\$77-154)
Kaswanga. Tom Mboya High School (I)	Kshs5,000-10,000 (\$77-154)
Kaksingri East, Sindo Primary School (M)	Kshs5,000-10,000 (\$77-154)
Ruma Nyatoto Primary School (L)	Kshs5,000-10,000 (\$77-154)
Mbita Township (Mbita's Hotel) (C)	Kshs5,000-10,000 (\$77-154)
Gembe Location Tetre Youth Group (L)	Kshs5,000-10,000 (\$77-154)
Kaksingri East. Gingo Primary School (M)	Kshs7,000-10,000 (\$108-154)
Gwassi West Tonga Primary School (M)	Kshs7,000-10,000 (\$108-154)
Wakianga/ Waware Sena Primary School (I)	Kshs8,000-10,000 (\$123-154)
Wakula Wakula Primary School (L)	Kshs8,000-10,000 (\$123-154)

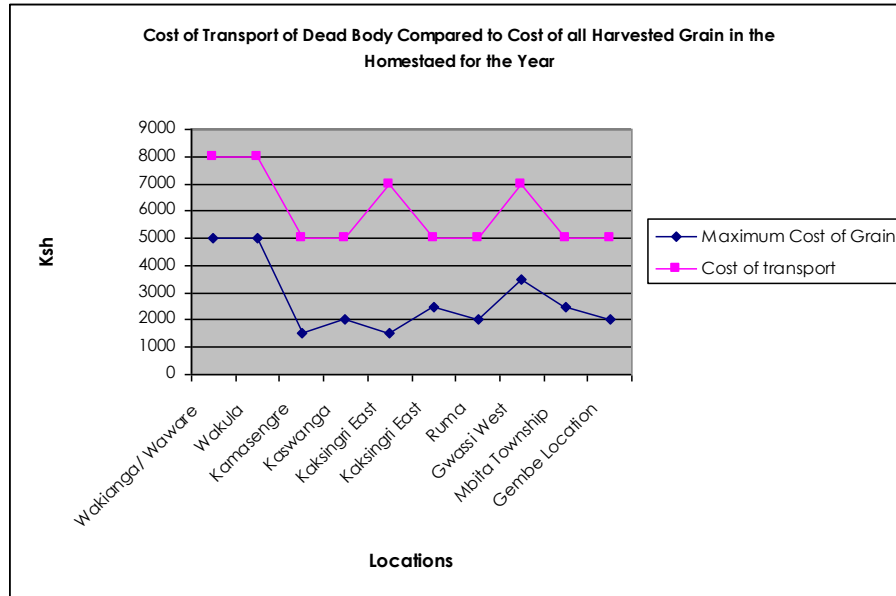
Source: Field work Note: L = Long distance area; I = Mountainous area; (I) = Island area; and (C) = Close to center

When one considers the cost of transporting a dead person vis á vie the 'savings' that the homestead has in terms of food stocks, then it is quite evident why many people balance between possibility of death (and inherent transport costs) and the consideration of letting one die at home. As was put by a man from Sindo:

“If somebody is very ill in Nairobi, Kisumu or Homa Bay, as a family we would rather they were brought home to die as this will reduce the costs of transport which can be very high”

The graph below shows the relationship between the costs of transport of a dead person and all the total money value of annual grain stock.

Cost of Transport of a dead Body in relation to cost of all harvested Grain



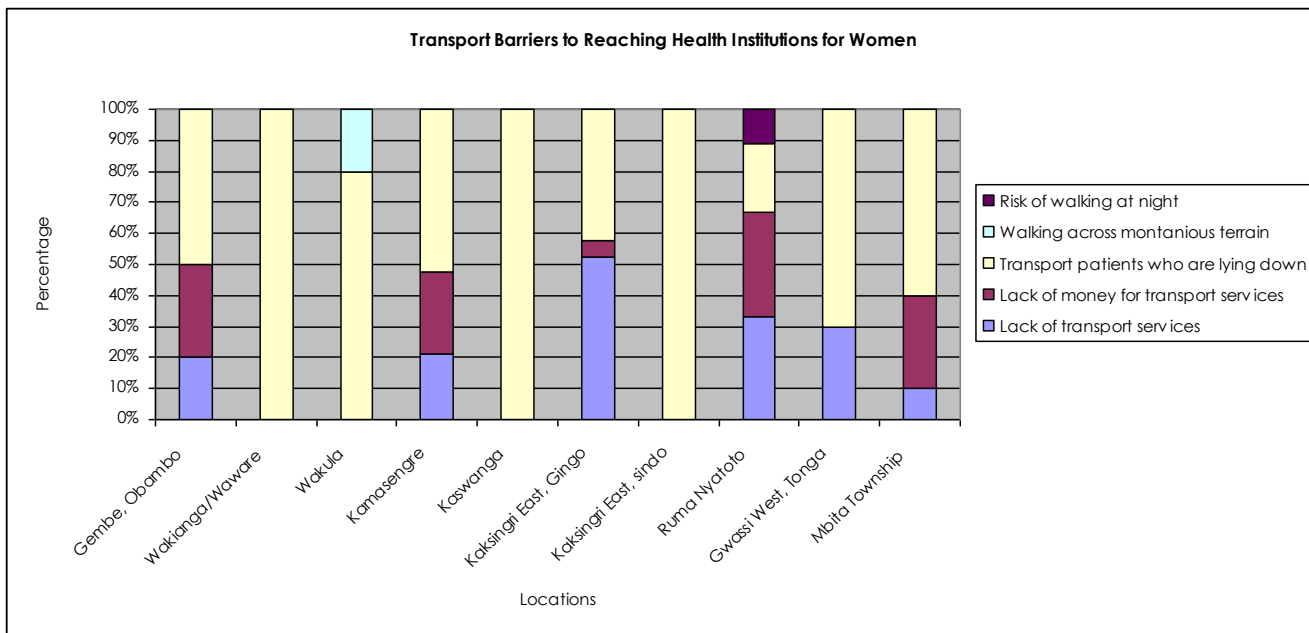
3.2 Opportunities for Improving Transport for Accessing Health Services

3.2.1 Major Transport Barriers to Access Health Institutions

The main barriers in transport to accessing health institutions in Suba are lack of transport services (including boat services) particularly in islands areas, lack of money for transport services when the services are available (this cuts across all the study areas except those close to service centers), lack of specialized affordable method of carrying patients who are not able to walk (cross-cutting), risk of walking to health institutions at especially in areas that are near the Ruma Game Park, and walking across the mountainous terrain with a sick person. While these issues are common to both men and women importance of each varies by location and gender.

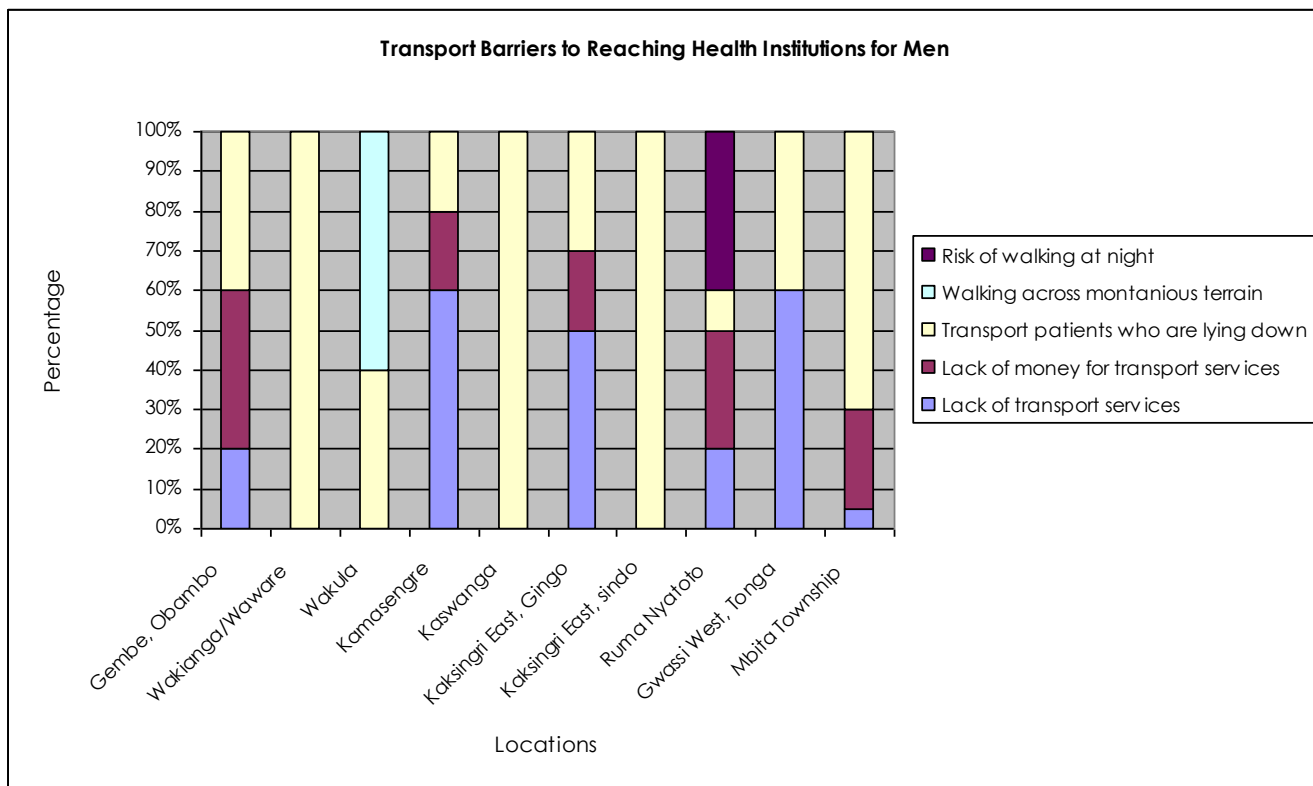
The following two graphs depict how men and women in the different locations consider as transport barriers to reaching health institutions.

Transport Barriers to Reaching Health Institutions for Women



Among women and men, transporting patients who are lying down is considered the main transport barrier to reaching health institutions in Wakianga/Waware Location (100%) and in Kaswanga Location (100%) – both areas in the isles; and Kaksingri East (100%) – mountainous area. In Wakula, long distance area, women (80%) reported, transporting patients who are lying down as the main challenge while men (60%) cited walking along mountainous terrain as the most challenging. Risk of walking at night was mentioned in Ruwa Nyatoto – a long distance area adjacent to a national park – where 40% (men) and 10% (women). The former are likelier to transport patients at night.

Transport Barriers to Reaching Health Institutions for men



"Lack of transport services" is mentioned more by men – 60% in Kamasengre and Gwassi West, and 50% in Kaksingri East. Women mention lack of transport services in Kaksingri East (54%), Ruma Nyatoto (34%) and Gwassi West (30%). Access to and control over cash income could be a factor underlying this gender difference in perception of transport barriers to reaching health institutions.

3.2.2 Health and Transport Needs Assessment

In discussions held with men and women of various communities in Suba, the following were considered to be ways that could be used to alleviate the transport for health problems that exist within the district.

The groups composed of men proposed the following methods:

1. Better road to reach main health institutions of Homa Bay, Mbita or Sindo;
2. A community or government run boat ambulance;
3. An road ambulance provided by the Government;
4. A clinic built within the nearest market centre
5. Improved non motorized transport that one can use as a stretcher(a picture of an bicycle ambulance was shown); and
6. Cheaper transport services for carrying sick people.

Table 16 below is of men from different communities voting on the above options while taking into consideration the practicality of each option.

Table 16: Men's priorities

	Gembe Location (Obambo)	Wakianga/Waware	Wakula	Kamasengre	Kaswanga.	Kaksingri East. Gingo	Kaksingri East, Sindo	Ruma Nyatoto	Gwasssi West Tonga	Mbita Township	Gembe (Tetre Youth Group)	Total
Better road to reach Homa Bay, Mbita or Sindo	0	0	0	1	0	2	0	10	5	0	4	22 (11.6%)
A community or government run boat ambulance;	0	15	10	6	15	0	0	0	0	2	0	48 (25.2%)
An ambulance provided by the Government	3	0	0	2	4	5	6	2	3	8	5	38 (20%)
A clinic build in the Market	4	3	7	0	0	5	0	6	0	0	2	27 (14.2%)
Improved non motorized transport for the locality	15	0	0	4	1	5	9	3	3	6	6	52 (27.3%)
Cheaper Matatus for carrying sick people	3	0	0	0	0	0	0	0	0	0	0	3 (1.6%)
Total	25	18	17	13	20	17	15	21	11	16	17	190 (100%)

Source: Fieldwork

Based on the prioritization results on the table above, men's top three priorities in terms of improvement of transport to health services are as follows:

1. Improved non motorized transport that can be used a stretcher within the locality;
2. A community or government run boat ambulance; and
3. A road ambulance provided by the Government.

About 60% of men who responded in Gembe Location (in category "a" long distance) and Kaksingri East (category "b" mountainous) cited improved NMT as a priority compared to Wakula Location, also a mountainous area, which had no man cite this option. This would suggest that personal circumstances rather than the place are a more important factor explaining the choices or preferences people made. In terms of the second priority, 83% of men in Wakianga/Waware, 75% in Kaswanga and 59% in Wakula preferred this option compared to none in Kaksingri East (Gingo and Sindo), Ruma Nyatoto, Gwasssi West, and Gembe (Obambo and Tetre Youth Group). The pattern is the same.

In the women's only group discussions, the following were suggested as ways that would improve transport to health institutions:

1. Bicycle taxis to carry children to clinic and hospitals;
2. A regular mobile clinic for ante natal and post natal care;
3. A community or government-run boat ambulance;
4. Better roads to reach Homa Bay/Mbita or Sindo in case of complications;
5. More trainings of community based health workers; and
6. Bicycle and/or motorbike bicycle ambulance with a stretcher.

Table 17 below is of women from different communities voting on the above options while taking into consideration the practicality of each option.

Table 17: Women's priorities

	Gembe Location (Obambo)	Wakianga/Waware.	Wakula.	Kamasengre	Kaswanga.	Kaksingri East, Gingo	Kaksingri East, Sindo	Ruma Nyatoto	Gwasssi West Tonga	Mbita Township	Gembe Location (Tetre Youth Group)	Total
Bicycle taxis to carry children to clinic and hospitals	5	0	0	4	0	6	5	6	6	6	2	40 (16.5%)
A regular mobile clinic for ante natal and post natal care	8	4	6	6	0	7	0	0	0	0	6	37 (15.2%)
A community or government run boat ambulance	0	10	11	2	7	0	0	1	0	7	0	38 (15.7%)
Better roads to reach Homa Bay/Mbita or Sindo in case of complications	4	0	0	0	0	5	2	8	3	5	2	29 (12.0%)
More trainings of community based health workers	5	0	4	5	0	11	0	4	6	0	5	40 (16.5%)
Bicycle and/or motorbike bicycle ambulance trailer for sick people	8	1	2	3	11	2	7	2	8	7	7	58 24.0%
Total	30	15	23	20	18	31	14	21	23	25	22	242 (100%0

Source: Fieldwork

From Table 17 above women top three priorities in terms of improvement of transport to health services are as follows:

1. Bicycle and/or motorbike bicycle ambulance trailer for sick people: the highest being Kaswanga (61%) followed by Kaksingri East (Sindo) 50%. By contrast in Kaksingri East (Gingo), also a mountainous area, only 6% prefer this option. This is yet another proof that considerations other than the spatial conditions might be at play here.
2. Bicycle taxis to carry children to clinic and hospitals: 35.7% of women respondents in Kaksingri East (Sindo) prefer this option compared to 19% in Gingo and zero in Wakianga/Waware and Kaswanga (island areas), and Wakula (mountain). In Kamasengre, another island area, 20% prefer this option.
3. More trainings of community based health workers: Gingo (35%), Gwasssi West (26%), Kamasengre (25%) and Wakula (17%)

The relationship between mobility and health is a complex one. It is embedded in the disease condition, social, economic and institutional realities in specific localities, which provide the context that mitigates availability of alternative means of transport, the choice of mode to use, and ultimately the health outcomes among members of households and communities.

Localized conditions, for example, fear of wild animals in areas bordering Ruma National Park notwithstanding, no overall pattern in terms of transport challenges or preferred interventions is discerned from any of the study areas characterized as savannah, island or mountainous. The same is true when the data is disaggregated and analyzed by gender. As a result, this exploratory study marks the birth of further detailed research on the relationship between transport and health in and possible transport and mobility interventions that may be considered in attempted to improve access to health in Suba and indeed the whole country.

The study findings should be disseminated to district and national stakeholders to increase knowledge and stimulate discourse on mobility and health issues. An important initial aim of the study was to be an action research that would provide knowledge to local functionaries of the Ministry of Transport, Ministry of Health and Child Welfare, among others, on how to improve access to health for geographical and socially marginalized people. Due to limited resources this objective was only partially met and it would be useful if additional resources could be invested in the next phase of the project to meet this objective much more.

As a starting point, the Kenya Forum for Rural Transport and Development should organize a stakeholders working group on health and mobility to spearhead several complementary initiatives key of which should include the launching of a national advocacy strategy targeting policy and key decision makers to complement on-going efforts towards achieving the Millennium Development Goals 4, 5 and 6. It will be important that a balance is struck between participation of grassroots communities and national actors.

Other interventions may include studies to help in health planning and in consideration for balancing between facility establishment/location or transportation intervention. There are also openings for further research in the field of appropriate transport interventions and sociology/transport geography studies which may include a variety of investigations on how transport burden, limited mobility and physical isolation is related to health and health related decisions in the household.

This study also points to an opportunity to initiate different types of transport interventions within the various communities and undertake a long term action research that would help elucidate and clarify some of transport and health issues. The main object of both detailed studies would be to develop detailed data and methods to develop time focused national spatial accessibility indicators to influence and contribute to definition of accessibility to health and investments in health.

References

Akado Medical Centre (2005). Malaria Education Day Report and Mosquito net Distribution in Mbita. Akado Medical Centre Mbita (unpublished)

Asowa-Omorodion F. I., "Women's perception of the complications of pregnancy and childbirth in two Esan communities, Edo State, Nigeria". *Social Science and Medicine* 1997; 44: 1817-24

Bertrand, J., K. Hardee, R Magnani, and M. Angle. 1995 "Access, Quality and Medical Barriers in Family Planning Programs." *International Family Planning Perspective* 21(2): 64-74

Bulletin of the World Health Organization 2002, 80 (11) Emergency medical care in developing countries: is it worthwhile? Junaid A. Razzak1 & Arthur L. Kellermann

Cassels, Andrew (2004) High Level Forum on the Health Millennium Development Goals Selected Papers 2003–2005: Resources, Aid Effectiveness and Harmonization. WHO Geneva

Collins DH., Quick JD., Musau SN., Kraushaar DL., Health financing reform in Kenya: The fall and rise of cost sharing. Stubbs Monograph Series No1. *Management Sciences for Health*, 1996

De Brouwere V, Tonglet R, Van Lerberghe W: Strategies for reducing maternal mortality in developing countries: what can we learn from the history of the industrialized West? *Trop Med Int Health* 1998, 3:771-782

Estimate by Government of Kenya, *Economic Survey 2004* (Nairobi: Central Bureau of Statistics, 2004 p8)

Gareth Williams and Roger Hay (2005) High Level Forum on the Health Millennium Development Goals Selected Papers 2003–2005: Fiscal Space and Sustainability from the Perspective of the Health sector

Gauthier, Aimée Using Bicycles to Save Lives Sustainabletransport Winter 2004 Number 16: ITDP, NY

GOK (2000), *District Development Plan, Suba District 2002-2008* Ministry of Planning and National Development, Nairobi

GOK (2001) National Malaria Strategy 2001-2010 an introduction. Division of Malaria Control Ministry of Health

GOK (2002) *Statistical Abstracts*, Central Bureau of Statistics, Ministry of Planning and National Development, Nairobi.

- GoK (2003) National Social Health Insurance Strategy, Ministry of Health
- GOK (2003) *Economic Survey, 2003* Ministry of Planning and National Development, Nairobi
- GOK (2004) Recommendations on Integrated National Transport Policy: *Moving a Working Nation*. Ministry of Transport and Communications
- GOK (2005), Adolescent Reproductive Health and Development Policy Plan of Action 2005–2015 Adolescent Division of Reproductive Health Ministry of Health
- GoK, *Economic Recovery Strategy for Wealth and Employment Creation: 2003-2007* (ERSP) (Nairobi: GoK, 2003)
- GOK, Ministry of Roads and Public Works *GOK/SIDA Roads 2000 Programme, Nyanza Roads Maintenance Programme 2004*
- Guagliardo, MF.;Ronzio, CR.;Cheung, I.;Chacko, E.; Joseph, JG. Physician accessibility: An urban case study of pediatric primary care. *Health and Place* 2004
- Ilse E Blokland¹, Daniel H Rosen³, Kubaje Adazu², Laurence Slutsker⁴ and
- John Alwar, Velepi Mtonga, Bonwell Sikatoye Report of the Summative Evaluation of the Essential Obstetric Care Project In Mpongwe, Masaiti and Lufwanyama, UNICEF Zambia Country Office, 2000
- Khan AA, Bhardwaj SM. Access to health care: A conceptual framework and its relevance to health care planning. *Eval Health Prof.* 1994;17:60–76
- Kim A Lindblade⁴ Use of antenatal services and delivery care among women in rural western Kenya: a community based survey. *Reproductive Health* 2006, 3:2 doi:10.1186/1742-4755-3-2
- Maganya J (1996) *Needs assessment for non-motorized transport in Western Kenya*. IT-Kenya's Rural Transport Programme (*Unpublished*)
- Mwaniki PK, Kabiru EW, Mbugua GG: Utilisation of antenatal and maternity services by mothers seeking child welfare services in Mbeere District, Eastern Province, Kenya. *East Afr Med J*2002, 79:184-187
- National Programme Guidelines on Orphans and other Children Made Vulnerable by HIV/AIDS* (Republic of Kenya, National Aids Control Council: March 2003)

Noorali R., Luby S., Rahbar M H., Does use of a government service depend on distance from the health facility? *Health Policy and Planning*, 1999; 14 [2]: 191-197

Oranga HM., Nordberg E., A longitudinal health interview in rural Kenya: Potentials and limitations in for local planning. *East African Medical Journal*, 1995; 72[4]: 241-247

Pattinson Robert et al. Improving survival rates of newborn infants in South Africa *Reproductive Health* 2005, 2:4 doi:10.1186/1742-4755-2-4

Penchansky and Thomas [22. Penchansky R, Thomas JW: The Concept of Access. *Med Care* 1981, 19(2):127-140] have usefully grouped barriers into five dimensions: availability, accessibility, affordability, acceptability and accommodation.

Priyanthi F. and Keter S (1997) Evaluation IT-Kenya's Rural Transport Programme. ITDG (PracticalAction) Kenya, Nairobi (Unpublished)

Republic of Kenya, *National Development Plan, 2002-2008*, (GOK, Nairobi: 2002)

Rosenfield A, Maine D. Maternal mortality—a neglected tragedy: where is the M in MCH? *Lancet* 1985; 2:83-5

Samai O, Senegheh P. Facilitating emergency obstetrical care through transportation and communication, Bo, Sierra Leone. *International Journal of Gynecology and Obstetrics* 1997; 59 Suppl 2:S157-64

Society for International Development (SID) *Pulling Apart: Facts and figures on inequality in Kenya*. (2004, pg 5)

Suneeta Sharma et all (2005), Formal And Informal, Fees For Maternal, Health Care, Services In Five Countries: *Policies, Practices, and Perspectives*. *Policy Working Paper Series No. 16 USAID*

Torfs M E., Mobile health care services in developing countries. *Public Health Reviews*, 1980; 9[1-2]: 93-112

Wachira J. and Nordberg E., “Airborne surgical outreach services in Eastern Africa”. *East African Medical Journal*, 1998; 75: 563-566

World Bank (2001) *Dying for change: Poor people's experience of health and ill-health*. World Bank, Washington DC

World Health Organization (1996), Department of Reproductive Health and Research: Coverage of maternity care: a listing of available information. 1996

World Health Organization (2004) PRSPs: Their Significance for Health: second synthesis report, WHO Document Production Services, Geneva, Switzerland

World Health Organization, *The World Health Report 2000 – Health systems: improving performance*. Geneva: World Health Organization; 2000

World Health Organization, UNICEF, UNFPA: Maternal mortality in 2000: estimates developed by WHO, UNICEF and UNFPA. Geneva, Switzerland; 2004

World Health Organization, UNICEF: Antenatal care in developing countries. Promises, achievements and missed opportunities. An analysis of trends, levels and differentials, 1990–2001 Geneva, Switzerland; 2003

Appendix 1

Checklist Used in study

1. What are the common diseases here
2. What are the transport needs for the common diseases that you have here
3. What are the factors that affect transport to health institutions
4. How do you deal with emergency transport issues
5. What are the types of savings that you have
6. How much does it cost to transport a sick person to a health institution
7. How much does it cost to transport a dead person from a health institution
8. How can you improve transport to health institution here

Appendix 2

Periods of Peak Labor Demand

January-February: This is the time for preparation of land, the tiling of land is done either by hand or use of animal draft power. When four bulls are used to cultivate at least three people are needed. The work starts early in the morning between 5-6 and goes on up to 11.00 in the morning. When the rains get closer there is desperation and period time taken in farms gets longer and in many cases there could be evening tilling, that can start at 5.00 and last up till 7.00. Some families re-till their land so that the soils become less chunky and easy to weed.

For families that are poor or have no cattle, the work is done by hand and takes much more time.

At the start of a farming period, men traditional have to “start⁵⁴” the farm activity with their wives. This belief is so deeply rooted that widows find no one willing to support them in start. This means that cannot start in time and children have to work much harder and miss school when they finally get somebody willing to help them start.

In Mfangano, Gwassi and Ruma areas soon after planting of seeds monkeys start digging out and eating the planted seeds. Boys, girls and women have to stay whole days to guard the seeds until they take root.

May-June: This is the weeding season. This season also coincides with a period of seasonal food shortage. Boys and girls work in their farms to weed before the rains end. Men and women also work in other farms for money. Most of the money that is made is used for purchase of food.

In Mfangano, Gwassi and Ruma areas women and girls have to stay whole days have to stay in the farm to guard against monkey which start eating the stems of the maize plantations.

August-September: This is harvesting period. All the produce usually has to be taken out of the farm; lest rodents and other pests start feeding on them. In Mfangano farms are far away from the homesteads women and their children have to go up to 45 minutes away then transport the produce to the homesteads.

⁵⁴ This traditional activity usually involves or has sexual connotations and is so important that if ones wife or husband is not there, they don't start farming activities in time with labor and food shortage consequences.