The Maasai People: Initial Investigations into Public Health Practices of the Loitokitok District

Master of Public Health Field Experience

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Overview

- **Introduction**
- **Purpose**
- **Background**
- **Surveys**
  - Household
  - Childhood
  - Mortality
- **Results**
- **Recommendations**

Lindsey Kelly, DVM
MPH Student

Personal Goals

Focus of potential project

- ▫ Enhance quality of life
- ▫ Improve public health of underprivileged individuals
- ▫ Aspects of agriculture and sustainability
- ▫ Avoid the snakes

Field Study Purpose

Public and Environmental Health Surveys

- International community-based experience
- Five year research plan
  - Identify health concerns
  - Maintain communication with community leaders and healthcare providers
  - Present findings to community

The School for Field Studies (SFS), in partnership with the Nomadic Integrated Development Research Agency (NIDRA), conducted a baseline survey to assess health indicators in the rural nomadic areas within the Loitokitok District.

Field Experience Mentors

Monica Onyango, RN, MPH

Senewa Montet-Timayio, PhD

Diverse MPH Field Study Team

Loitokitok District

Kilimanjaro Base Camp
Kenya, East Africa
30 May – 5 July 2007

Course Work for Cultural Integration

Kenya, East Africa

- Independence 1963
- Republic under President Mwai Kibaki
- 40 million people, 42 ethnic tribes with 120 sub-tribes
- HIV/AIDS has a 7.4% adult prevalence (KAIS)
- Rainy seasons
  - March to April
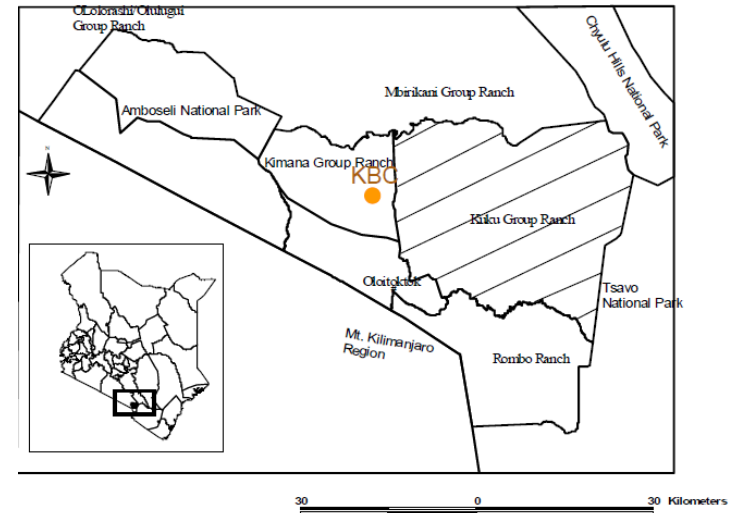 - October to December

Loitokitok District

Loitokitok District

- **Rift Valley Province**
  - New district in 2007
- **6,006 km²**
- **150,000 people**
- **Six Group Ranches**
- **100+ Primary Schools**
- **12 Secondary Schools**

- **Maasai**
  - ¾ population
  - 3 – 4% literacy rate
    - Kenyans 85%

(Seno)

Group Ranches
Stationary Agro-Pastoralist Subsistence

- **Land Act 1968**
- **Loitokitok Ranches**

Kimana

Kuku

Mbirikani

Olgulului

Rombo

Eselenkei

The Maasai

Historically nomadic pastoralists reliant on livestock in Kenya and Tanzania.

Shift towards semi-sedentary agro-pastoralist lifestyle with the advent of group ranches.

Decreased land availability has caused overgrazing, water pollution and depletion, and increased disease among the people and their livestock.

The Maasai

The Maasai

Manyattas

Several houses made of mud and manure over a wooden framework, surrounded by a brush fence.

A central corral is used to keep livestock safe.

The Maasai

Crop farming on community and individual land

      Irrigation

      Fertilizers

      Pesticides

Wildlife conflict in Kimana

  90% farmers & 60% herders

Compensation for damages

  25% farmers & 19% herders

(Campbell 2003b)

Healthcare Facility Evaluations

4 Health Centers

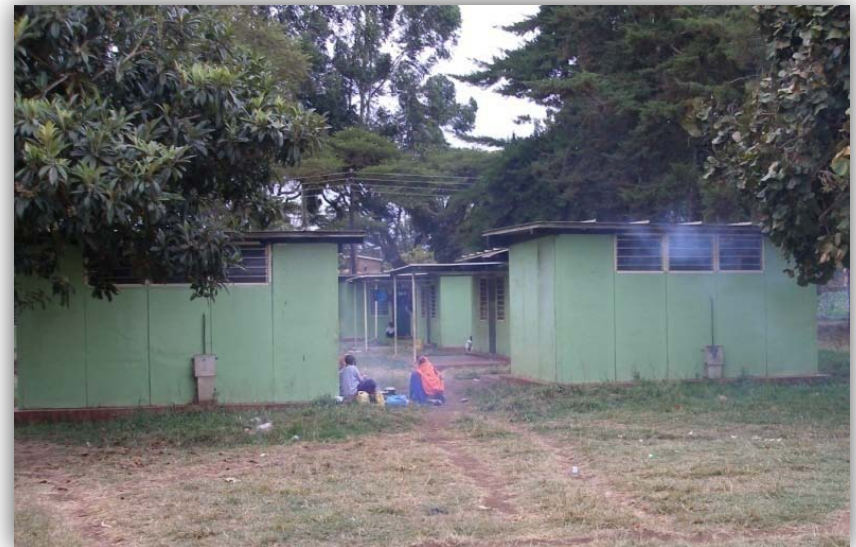14 Medical Dispensaries

- Private Clinics
  - Expensive equipment
  - Well stocked pharmacy
  - Few patients
- Government facilities
  - Under-staffed
  - Under-stocked

Healthcare Providers

Community Service Health Clinics

Several stations

- Childhood immunizations
- Weight and height for growth evaluation
- Childhood deworming
- Vitamin A supplements
- Family planning for mothers
- Consultations
  - Loitokitok District Hospital
    - Doctor
    - Nutritionist

Amboseli & Tsavo West

KIMANA MARKET LIVESTOCK

Item	Quantity	Market Price Kenya Shillings (USD)		
		June 2007	March 2007	June 2006
Bull	1	25,000 ($347)	25,000 ($347)	18,000 ($250)
Milking Cow	1	15,000 ($208)	8,000 ($111)	11,000 ($153)
Pregnant Cow	1	18,000 ($250)	12,000 ($167)	12,000 ($167)
Calf	1	5,000 ($69)	6,000 ($83)	3,000 ($42)

Kimana Market

LIVESTOCK			
Market Price Kenya Shillings (USD)			
Item	June 2007	March 2007	June 2006
Sheep	3,000 ($42)	2,000 ($28)	2,000 ($28)
Lamb	1,300 ($18)	1,200 ($17)	1,000 ($14)
Goat	4,000 ($56)	4,000 ($56)	3,500 ($49)
Kid	1,400 ($19)	1,100 ($15)	900 ($13)

Baseline Survey of Health Indicators

**Rural Nomadic Communities
Loitokitok District
Kenya**
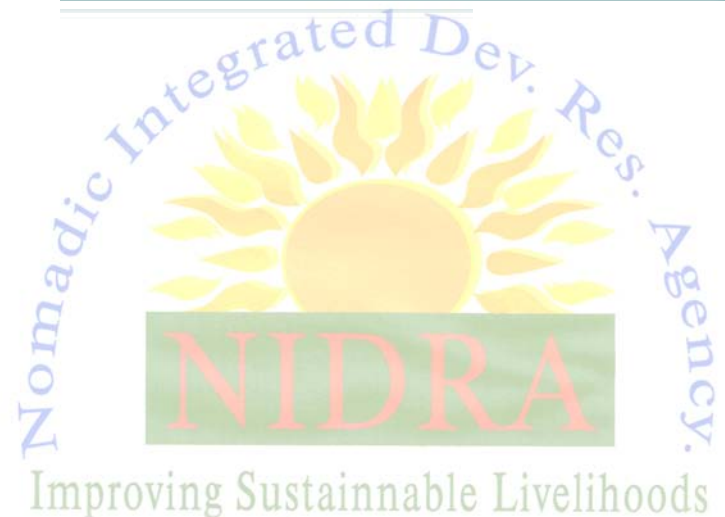
Methodology

Design

2 stage 30x30 sampling

- No Registries
- Level 1 – 30 areas
  - Estimated population densities
  - Community health workers (CHWs)
- Level 2 – Children at the household level*
  - At least 30 childhood surveys at each area

*A household is defined as people that cook and eat from the same cooking pot.

Methodology

Survey Collection

- Started at center of area
- Direction of dropped spinning pencil
  - Manyatta on left if more than one

First survey of hut on left of boma entrance

Surveys collected on foot

- Two-way radios
- Miles between manyattas

Data Collection

Surveys

Three surveys

- Household survey – Every third household (N = 300)
- Mortality survey - Every household (N = 622)
- Childhood survey - Children 6 - 59 months & 60 - 115 cm
    - Anthropometric data
    - Immunization data
    - Concurrent with household surveys (N = 955)

Childhood Survey

6 – 50 months old
60 – 115 cm height

Mid-Upper Arm Circumference (MUAC)

Red: < 11 cm
Orange: 11 – 12.5 cm
White: 12.5 – 13.5 cm
Green: > 13.5 cm

(Cogill)

Weight Collection

Areas Evaluated

Nutrition
- Malnutrition
  - Acute
  - Chronic

Health Status
- Immunization History
- Healthcare Source
- Morbidity & Mortality
- Child Delivery Location

Water & Sanitation
- Source
- Treatment
- Rubbish Disposal

Food Security & Assets
- Income
- Food Supply
- Registration for Relief Food
- Environmental Conditions
- Land
  - Crops
  - Livestock

Data Analysis

A descriptive analysis was done, as the data is the baseline information that will be used for comparison in later studies.

- Data Entry
  - Microsoft Excel 2003
- Weight for Height
  - Epi Info™
- Analysis
  - SPSS 9.0
  - Microsoft Excel 2003

Demographics

Households

- Average of seven (6.38) people
- Average of two (1.62) children under 5 yr

Household Survey Education Levels (N=300)

Education Level	Head of Household		Primary Caretaker	
	n	%	n	%
No Education	207	69.0	234	79.6
Primary School Dropout	40	13.3	31	10.5
Primary School Graduate	29	9.7	22	7.5
Some Secondary School	19	6.3	6	2.0
Some College/University	5	1.6	1	0.3

Food Security and Assets

Main Household Income Sources

Main Source of Income	Current Year (N=295)		Normal Year (N=300)	
	n	%	n	%
Sale of own food crops/animals	231	78.31	236	78.67
Daily labor	25	8.47	26	8.67
Salary	14	4.75	12	4.00
Petty trading	8	2.71	8	2.67
Other	17	5.77	18	5.99

Food Security and Assets

- The main food source was home grown, followed by market purchases.
- Only one household listed relief food as their primary source, but 30.7% of families were registered.
- 65.3% of households reported access to land for farming.
  - 45.7% of this land was community land
  - Average acreage was 2.45 acres
    - Ranged from ¼ to 20 acres

Food Security and Assets

Crop Planting Patterns and Stores for All Households (N=300)

Crop	Planted Normal Year		Planted Current Year		Stock in Store	
	n	%	n	%	n	%
Maize	175	58.3	148	49.3	69	23.0
Beans	146	48.7	123	41.0	43	14.3
Onions	36	12.0	26	8.7	1	0.3
Tomatoes	27	9.0	20	6.7	2	0.7

Food Security and Assets

Main Crops Planted for Households that Planted (N=168)

Crop	Households Who Planted Crops this Year		Households that Planted the Specific Crop this Year			
			Average Amount Planted (kg)			
	n	%	Mean	Std. Dev.	Minimum	Maximum
Maize	148	88.1	17	22.6	1	180
Beans	123	73.2	29.7	20.6	2	90
Onions	26	15.5	2.9	2.0	0.05	8
Tomatoes	20	11.9	5.8	22.2	0.05	100

Food Security and Assets

Household Livestock Holdings (N=300)

Animal	Households with Livestock Current Year		Average Animals Current Yr	Average Animals Normal Yr	Households that Sold Animals in the Past Month	
	n	%	n	n	n	%
Cattle	220	73.3	13	19	96	32.0
Milking Cows	213	71.0	4	5	7	2.3
Goats	259	86.3	19	27	94	31.3
Sheep	216	72.0	15	19	38	12.7
Chickens	136	45.3	5	6	20	6.7

Water and Sanitation

Water Quality

Primary Water Source (N=300)	n	%	Households with Unprotected Water Source (N=215)	n	%
Unprotected stream/river	182	60.67	No Treatment	165	76.74
Protected source	85	28.33	Boiling	44	20.47
Other	14	4.67	Water Guard	4	1.86
Unprotected pond	11	3.67	Other	2	0.93
Unprotected well	8	2.67	Chlorination	0	0.00
			Filtering	0	0.00

Water and Sanitation

- 75% of households use the toilet in the bush (open air). The others use latrines.

- Rubbish disposal is mainly by burning (78.7%), followed by throwing it into the streets or bush (15.7%).

Health

Childhood Survey

▫ 94.5% delivered at home (N=955)

▫ 42.5% fully immunized (9 – 59 mo)

▫ 31.7% up to date (6 – 9 mo)

▫ 4.9% received no vaccinations (6 – 59 mo)

Childhood Immunizations

▫ Measles   - Right deltoid

▫ BCG (Tb)   - Left forearm

▫ Poliomyelitis   - 4 doses, oral

▫ DPT   - 3 doses, upper thighs alternated

      (Diphtheria, Pertussis, Tetanus)

Health

- 60.3% of children (6 – 59 mo) had illness of some form in the 2 wks prior to the survey (N=955)

- 53.3% of morbidity incidence occurred in children from households using unprotected and untreated water (N=576)

- 25.7% in households with protected but untreated water (N=576)

- The majority of these illnesses were defined as fever/malaria, respiratory tract infection, vomiting, and diarrhea.

Mortality

Included deaths in the 3 months prior to the survey for individuals < 5 yrs & ≥ 5 yrs of age.

- 33 deaths (N=3,854)
  - < 5 yrs
    - 1.2% mortality rate
    - Main causes: fever/malaria & delivery complications
  - ≥ 5 yrs
    - 0.7% mortality rate
    - Main causes: fever/malaria & tuberculosis

Nutrition

- **MUAC Measurement**
  - Acute malnutrition
  - 90.8% healthy
- **Wasting**
  - Acute malnutrition
  - 94.9% healthy
- **Stunting**
  - Chronic malnutrition
  - 67.5% healthy
  - 10.6% severe maln.

Presentations

- **Ministry of Health & local healthcare providers**
  - ▫ Data indicated areas of necessary change in local healthcare to be more specialized to the needs of the people.

- **Stakeholders & community leaders**
  - ▫ Data highlighted the positive and negative areas observed, with negative areas focused on issues that can be improved by more practical methods.

Summary of Main Recommendations

- **More data needed to see why children are not attending school, and the average age at which girls and boys each stop attending school.**
  - ▫ Sensitize community to the importance of education before marriage and family responsibilities

Food Security and Assets

- Focus: availability, accessibility, adequacy, & acceptability
- Reasons for purchasing food from the market.
- Farming practices utilized.
- Evaluate quality of livestock health and need for improving body condition, production, and disease prevention in order to benefit the health of the Maasai community.
  - Maasai heavily rely on their livestock as their livelihood and measure of wealth.
- Availability of local grazing areas.

Water and Sanitation

- Identification of waterborne diseases that are a problem in the area, followed by deciding if the current water treatment practices utilized are beneficial in preventing diseases.
- Utilization of the livestock as the primary interest of the Maasai to encourage compliance in better water management.

Health and Nutrition

- Education for expectant mothers at antenatal and postnatal counseling on immunization completion and utilization of staple foods for maximal nutrition for mothers and children.
- Since 94.5% of children are born at home, train traditional birth attendants (TBAs) to educate mothers about immunizations and nutrition.

Conclusions

- Water and food security will have the greatest impact on the overall health of the people and their livestock.
- Using the cultural and financial reliance on the livestock as a means for preventative education is an important component in the success of this endeavor.
- It is imperative to understand the education level of the people to best formulate means of incorporating preventative medicine education into the lives of the people that the project intends to improve.

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