



## Selection of Regions and Health Facilities for EMBLEM Study

Considering that

- This being an epidemiologic study, we would need to eventually obtain controls for each enrolled case, from the same district as the case
- The cases and controls would therefore need to come from within a defined geographic area, reachable within a few hours by field visits
- All study samples, including control samples, need to be processed within 8 hours of collection, with samples stored in -80 C freezers

We therefore decided that.....

–Mwanza Region

–Mara Region

are the defined area from which cases and controls must come



Lake Victoria Shore near Shirati, Mara Region  
(Site of SHED Foundation EMBLEM Study Unit)



Bugando Medical Center, Mwanza Region  
*Lake Victoria in Background*



Ferry crossing on Lake Victoria in  
Mwanza Region to reach  
Sengerema DDH from Mwanza City



We therefore decided that.....

- Mwanza and Mara Regions are the defined area
- One laboratory will be set up for each region
  - Bugando Medical Center in Mwanza Region,
  - SHED Foundation EMBLEM Research Unit in Shirati, for Mara Region

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- One laboratory will be set up for each region
- For case enrollment, either:
  - Patients can be referred to one of the two main study sites where labs are located, or
  - Couriers can screen, consent, and enroll patients at whichever other health facility they attend, and transport samples to one of the two study labs

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- For control enrollment, field specimens will be processed at the lab in the respective region

## Major Tasks in Tanzania

- Identify and define geographic study area
- Obtain Ethical and Research Clearance

## Obtain Ethical Clearance

- First draft of EMBLEM Study Protocol submitted to National Institute of Medical Research (NIMR) in May 2010
- Several revisions necessary
- Final approval of EMBLEM Study protocol for Tanzania:

## EMBLEM Study Protocol for Tanzania NIMR approval on 1 November 2010



## First year renewal of ethical approval for EMBLEM study



## Major Tasks in Tanzania

- Identify and define geographic study area
- Obtain Ethical and Research Clearance
- Hold informational meeting with district and regional medical officers in study area

## At this meeting, we.....

- Reviewed history of BL Research in Lake Zone
- Reviewed BL including usual presentation, diagnostics, and current treatment protocol
- Explained EMBLEM Study
  - Epidemiologic study (not a treatment trial)
  - Compares 1500 cases with 3000 matched controls
  - Involves centers in three countries (Uganda, Kenya, and Tanzania)
  - Looks at malaria and EBVirus in relation to BL



## Major Tasks in Tanzania

- Identify and define geographic study area
- Obtain Ethical and Research Clearance
- Hold informational meeting with district and regional medical officers in study area
- Gather and compile background BL data from study area

Permission to use existing BL database information obtained from each of six hospitals in EMBLEM Study area



Pediatr Blood Cancer

### Incidence and Trends in Burkitt Lymphoma in Northern Tanzania From 2000 to 2009

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**Introduction.** Burkitt lymphoma (BL) is endemic in parts of Tanzania, but there is scant country or region level data about burden and trends of BL in Tanzania over the past three decades. Here, we update baseline epidemiology of BL in northern Tanzania using recent data. **Procedure.** Data for childhood BL diagnosed at six hospitals in Mara and Mwanza regions in northern Tanzania during 2000–2009 were compiled. Age, sex, and regional patterns were analyzed. Crude incidence rates of BL were calculated by sex, anatomic site, geographical region, and calendar year. **Results.** Among 944 cases, 549 (58%) were male (male/female case ratio 1.4:1). Among those with known anatomic site (92%), facial only tumors represented a large proportion of tumors in boys than girls (50% vs

36%,  $P < 0.002$ ). Tumors occurred at a younger mean age in boys than girls (6.8 years vs. 7.6 years,  $P < 0.01$ ). Crude BL incidence was 4.2 per 100,000, but varied by region (3.0 in Mwanza vs. 6.8 in Mara,  $P = 0.01$ ), by district (1.4–22), by gender (5.0 in boys vs. 4.0 in girls), and by age group (2.0 in 0–4, 7.8 in 5–9, and 3.1 in 10–15 years). BL incidence peaked in 2001 and decreased gradually thereafter. **Conclusions.** Our results indicate that male sex, young age, and geographical characteristics are risk factors for BL in Tanzania. BL incidence declined with calendar year, but the significance of this finding is uncertain. Well-designed epidemiological studies of BL in Tanzania may shed light on environmental characteristics underlying these patterns. *Pediatr Blood Cancer* © 2012 Wiley Periodicals, Inc.

**Key words:** Burkitt lymphoma; epidemiology; Epstein-Barr virus; malaria; Tanzania

#### INTRODUCTION

Burkitt lymphoma (BL) is endemic in sub-Saharan Africa, including parts of northern Tanzania [1,2], where it accounts for 50–70% of all new childhood cancers diagnosed each year [3]. Endemicity of BL is linked to chronic and intense transmission of *Plasmodium falciparum* malaria [4] and infection with Epstein-

Bar virus [5]. We would expect the biological effects of malaria on BL risk to begin earlier and persist for life in holoendemic malaria areas.

As part of a plan to conduct an epidemiological study to examine the link between BL and malaria in East Africa [15], including Tanzania, we implemented a systematic search of BL cases diagnosed over a 10-year period in Mara Region in northern Tanzania, where BL is historically known to be endemic [16], and in Mwanza



## Major Tasks in Tanzania

- Identify and define geographic study area
- Obtain Ethical and Research Clearance
- Hold informational meeting with district and regional medical officers in study area
- Gather and compile background BL data from study area
- Hire and train study staff





## Major Tasks in Tanzania

- Identify and define geographic study area
- Obtain Ethical and Research Clearance
- Hold informational meetings with district and regional medical officers in study area
- Gather and compile background BL data from study area
- Hire and train study staff in three sites
- Set up offices and laboratories at Bugando and Shirati



EMBLEM Study Manager in EMBLEM office at Bugando Medical Center



### EMBLEM Study Manager at Shirati Office



### EMBLEM Study Data Manager in Shirati Office



### Laboratory at EMBLEM research unit in Shirati



### Major Tasks in Tanzania

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- Obtain Ethical and Research Clearance
- Hold informational meetings with district and regional medical officers in study area
- Gather and compile background BL data from study area
- Hire and train study staff in three sites
- Set up offices and laboratories at Bugando and Shirati
- Purchase vehicle and ship into the country



### Plan for Treatment of BL Patients

- EMBLEM Study is not a treatment trial, however
- Ethically, treatment of enrolled patients is a concern that must be addressed
- EMBLEM collaborated with INCTR at one site in Tz to assure treatment availability through another research protocol
- All the other sites were already being supplied treatment drugs from IMA





72 HOURS LATER...

Using Current Tanzania Standard  
Treatment Guidelines for BL



### The Larger Task:

.....it is time to re-explore, with modern techniques, some of the questions that were raised some 50 years ago shortly after Burkitt's first description, as well as new questions that can be asked only in the light of modern understanding of the immune system and the molecular basis of tumor development."

Dr. Ian Magrath, "Denis Burkitt and the African Lymphoma", INCTR "Network" Newsletter, Vol. 8 No. 2, 2008

### Using Current Tanzania Standard Treatment Guidelines for BL

Prior to Treatment



One Year after Treatment

