



# Baseline information at Iganga-Mayuge Demographic Surveillance Site: a new malaria field study site in eastern Uganda

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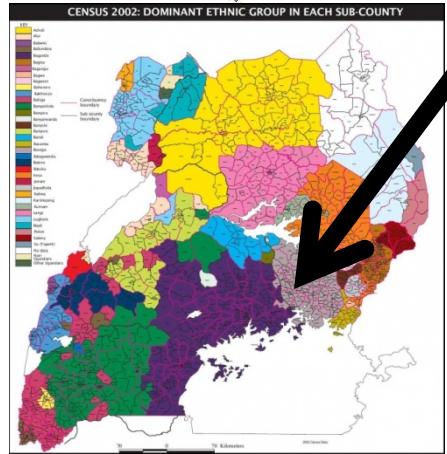
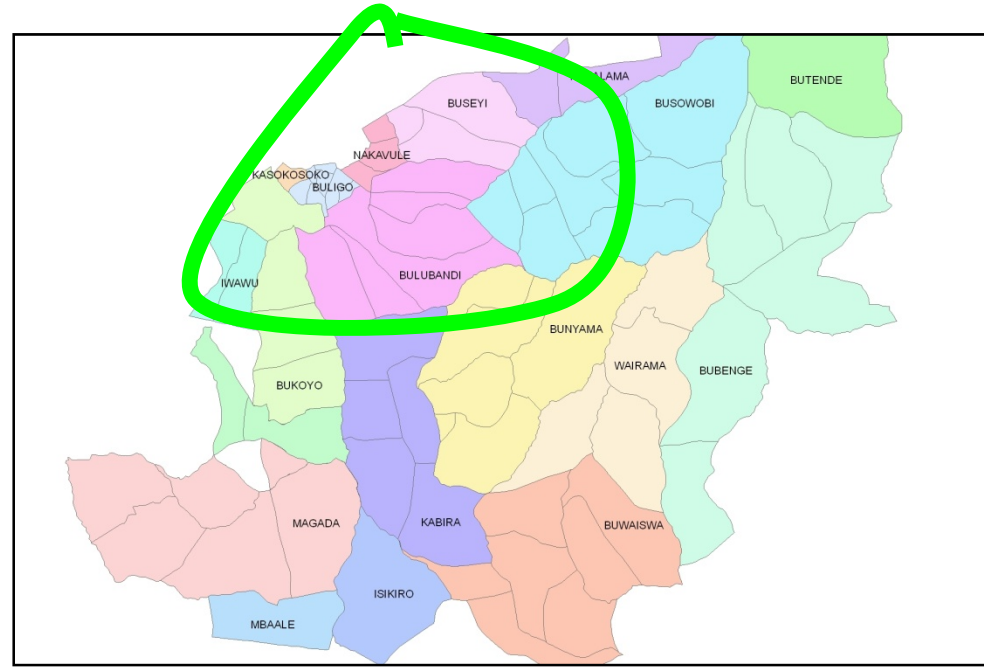
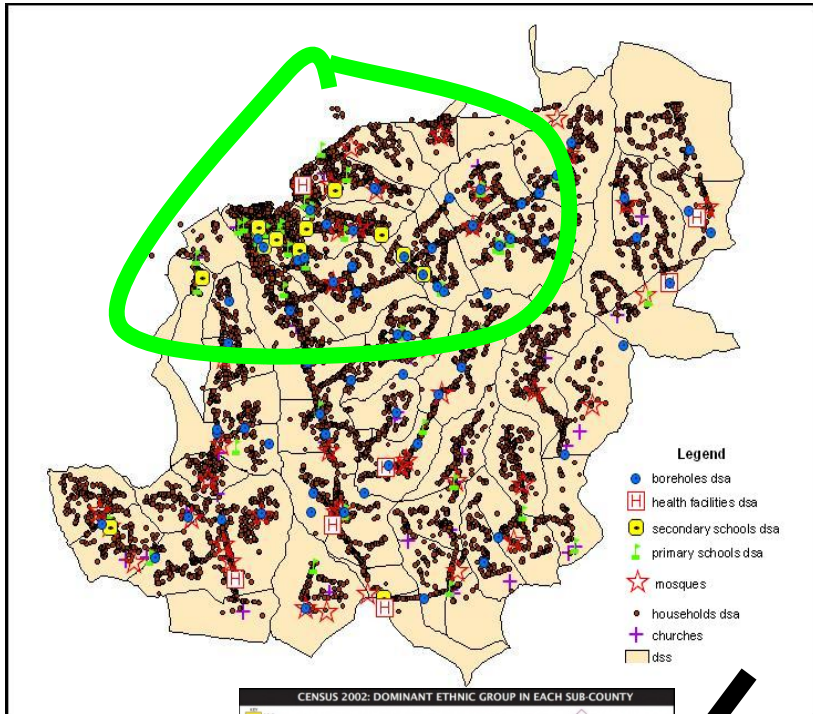


# Objectives

1. Characterize **cohort** for malaria vaccine trials
2. Define **basic epidemiological and malaria** associated characteristics.
  - a) Basic **Host Genetics** (ABO phenotype)
  - b) Basic **blood chemistry** (Hb, TBC)
  - c) *P. falciparum* **infection** frequency
  - d) **G6PD** deficiency
  - e) **RANTES** (**R**egulated Upon **A**ctivation and Normal **T**-cell, **E**xpressed & **S**ecreted) promoter gene polymorphism : -403, -28



# Iganga DSS ( Population total =100,000 15 000 < 5 Yrs )



6 villages around Iganga (total population of children > 5-10,000)  
Selected for malaria Project  
Peak malaria transmissions: Mar/Apr-  
June, Sept-Nov



# Methods (1)

1. Protocol authorization ( MU-IRB, UNCST)
2. Community Permissions/Education
3. Screen systematically , Informed Consent,  
Recruit : 950 children (6 mo – 9 Yrs)
4. Treat illnesses/refer, test blood, all recruits  
advised to visit project clinic whenever ill
5. Surveillance :
  1. 450 children ( Passive, no home visits)
  2. 450 children ( Active, visited once a week)
6. Determine *P. falciparum* infection rates at  
recruitment and at visits to project clinic



## Methods (2)

1. Infection rates : **microscopy** ( 2 readers)
2. Hematology (**Coulter counter**)
3. ABO genetics ( **serology** anti-A, anti-B, anti-RhD)
4. G6PD deficiency (**PCR**, allele A- common most mutated in Africans)
5. RANTES promotor genotype (**PCR**, RFLP): -403 and -28 positions



# Results (1)

- a) 952 children (49 Female, 51 male ) recruited
- b) 37% microscopy +ve *P. falciparum* infn
- c) 57% (under 5 yrs , n = 642) *falciparum* +ve
- d) All *falciparum* infected treated by ACTs
- e) G6PD A- = 20%, but no correlation with *P. falciparum* infection ( n = 350)
- f) ABO : A<sup>+</sup> = 25%, B<sup>+</sup> = 30%, AB<sup>+</sup> = 6%,  
O<sup>+</sup> = 38%, A<sup>-</sup> = <1%

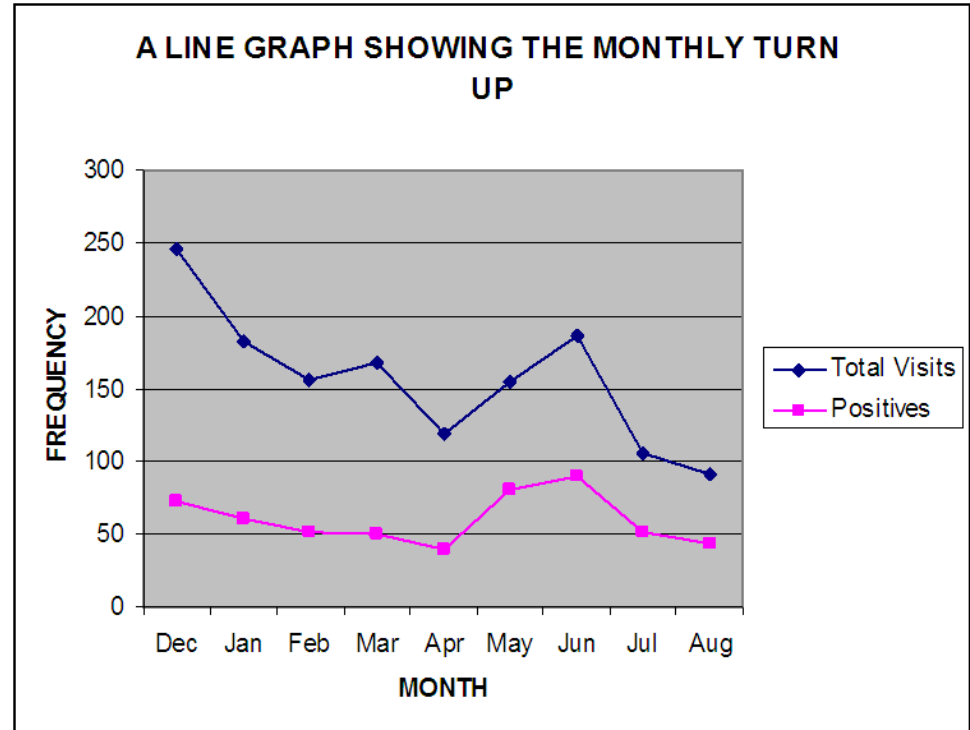


# RESULTS



80% Positives are < 5 Yrs Old

MONTH	TOTAL VISITS	TOTAL +ve	< 5 Yrs	% < 5 Yrs
December	246	73	<b>60</b>	<b>82.2</b>
January	182	61	<b>47</b>	<b>77.0</b>
February	156	52	<b>43</b>	<b>82.7</b>
March	168	50	<b>40</b>	<b>80.0</b>
April	119	40	<b>34</b>	<b>85.0</b>
May	154	81	<b>67</b>	<b>82.7</b>
June	186	90	<b>67</b>	<b>74.4</b>
July	106	51	<b>42</b>	<b>82.4</b>
August	91	44	<b>35</b>	<b>79.5</b>
<b><u>TOTAL</u></b>	<b><u>1408</u></b>	<b><u>542</u></b>	<b><u>435</u></b>	<b><u>80.3</u></b>



Infections per child/time

$$542 \times 100 \times 12 / (9 \times 950) = \underline{\underline{0.76}}$$

$$\text{Loss to follow up} = 15\% = \underline{\underline{0.87}}$$

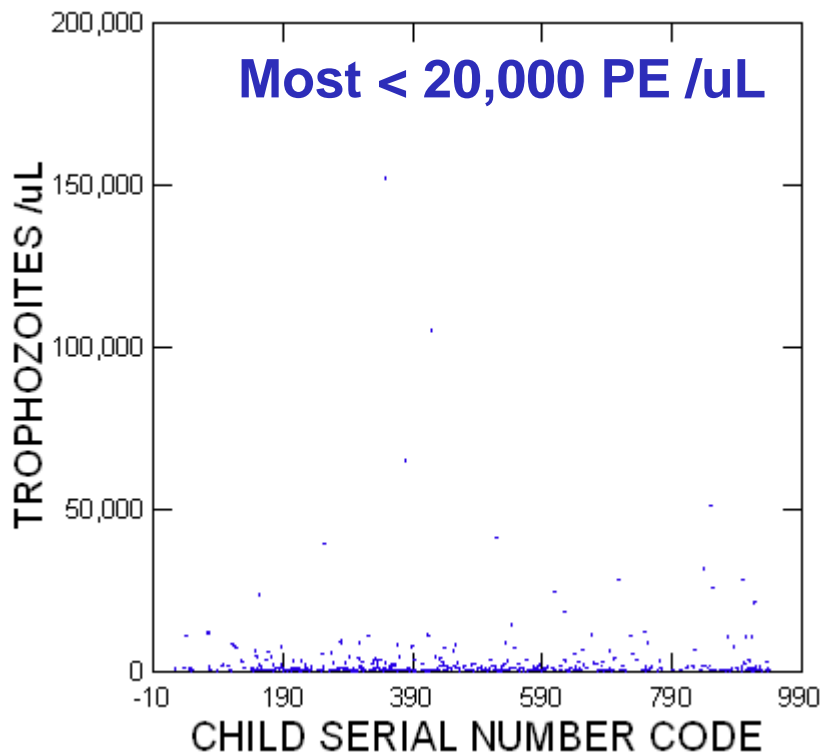
Corrected Infections /child.Yrs

$$= \underline{\underline{0.87}} \quad ( < 5 \text{ yrs} = 12 \times 435 \times 1.15 / (684 \times 9) = \underline{\underline{0.98}})$$

Infections per child per Yr = 0.7 to 1



# Parasitemia ( n = 900)



**8 % Gametocytemia ( 5 to 225 /uL)**

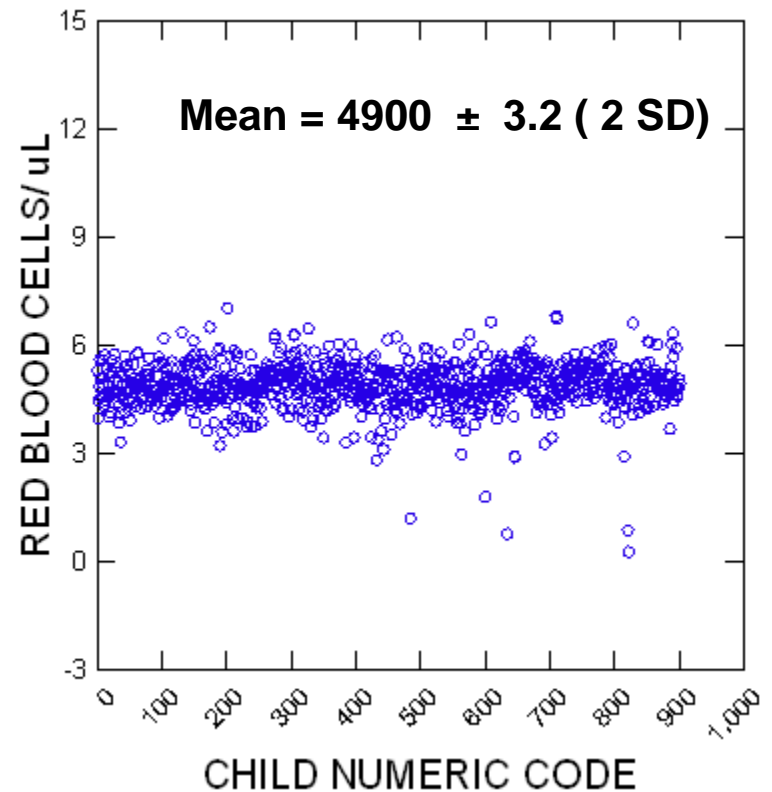
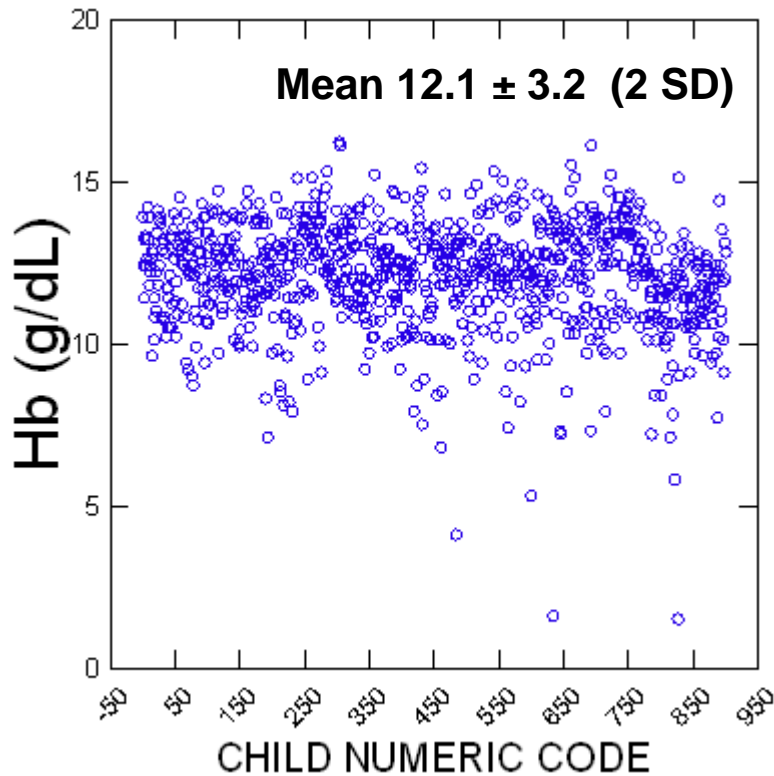
PE = Parasitized Erythrocytes

	VAR_2
N of Cases	355
Minimum	<b>25.000</b>
Maximum	<b>151,800.</b>
Range	151,775.000
Sum	1,237,749.737
Median	625.000
Arithmetic Mean	<b>3,486.</b>
Standard Error of Arithmetic Mean	621.411
95.0% Lower Confidence Limit	2,264.497
95.0% Upper Confidence Limit	4,708.741
Trimmed Mean (10%, Two Sided)	1,255.017
No. of Observations Trimmed Out	72
Geometric Mean	738.758
Harmonic Mean	278.082
Standard Deviation	<b>11,708.</b>
Variance	1.371E+008
Coefficient of Variation	3.358
Skewness(G1)	8.562
Standard Error of Skewness	0.129
Kurtosis(G2)	90.993
Standard Error of Kurtosis	0.258



EDCTP

# ANEMIA ( Hb & RBC)

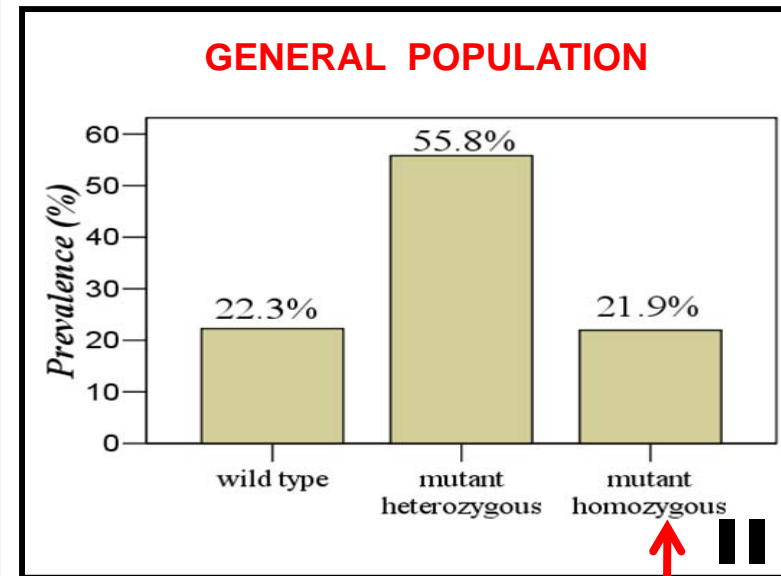
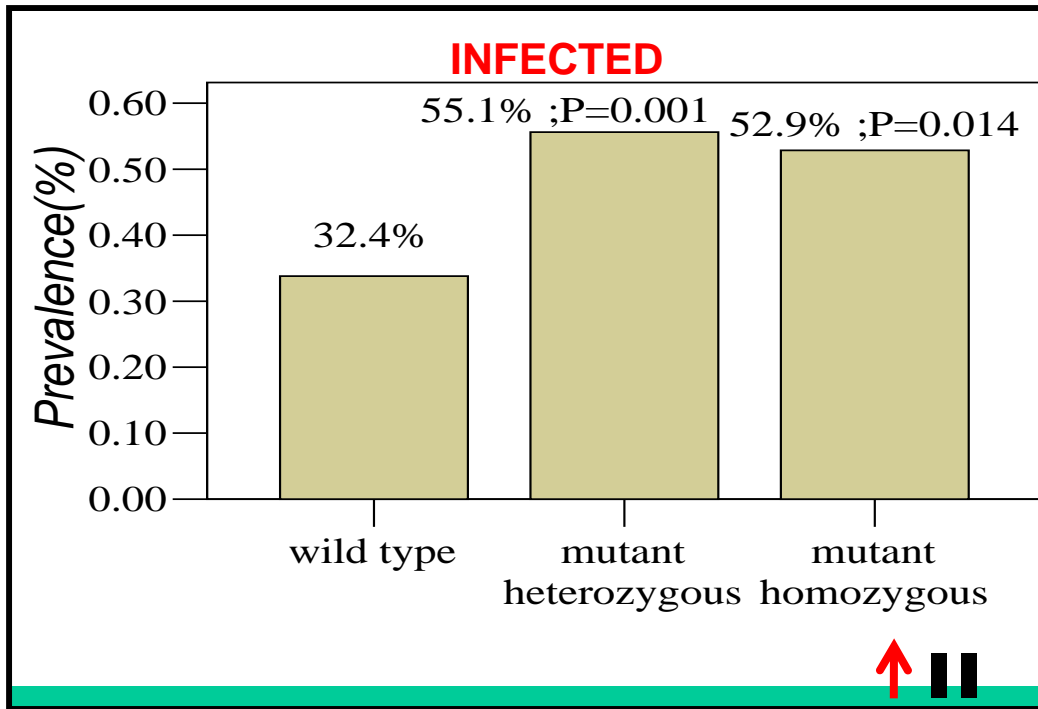




# RANTES (-403) TRAIT HIGH AMONG FALCIPARUM INFECTED CHILDREN AT IGANGA



N = 350



1. MUTATION AT RANTES ( -403) IS 56% (HETEROZYGOUS, █ ) AND 22% (HOMOZYGOUS, █ █ ) IN GENERAL POPULATION
2. BOTH CHROMOSOMES CARRY THE MUTATION IN THE POPULATION AT 22%, THIS PERCENTAGE IS MORE THAN DOUBLE (52.9%) IN THE INFECTED POPULATION. **TRAIT MAY RISK *P. FALCIPARUM* IN FECTION**



# Discussion & Conclusions



- 40 % Parasite carriage (overall) , 60% ( in under-fives) is of concern, even though gametocyte carriage is low ( 8%)
- G6PD A- trait (20%) agrees with prior reports in region. No correlation to malaria seen, perhaps should enlarge sample size to > 350.
- RANTES (-403) trait risking infection (in homozygotes) warrants broader investigations



# Future perspectives



- COMMUNITY AWARENESS (MALARIA & TRIAL ISSUES) MOBILIZED
- RANTES (-403) TRAIT STUDIES BE BROADENED
- 20% G6PD A – deficiency (cautionary for drug sensitivity)
- PEAK INFECTION RATES (60%) CAUSE CONSERN