

Feasibility of determining the prevalence of Malaria in Pregnancy during ANC in Rwanda

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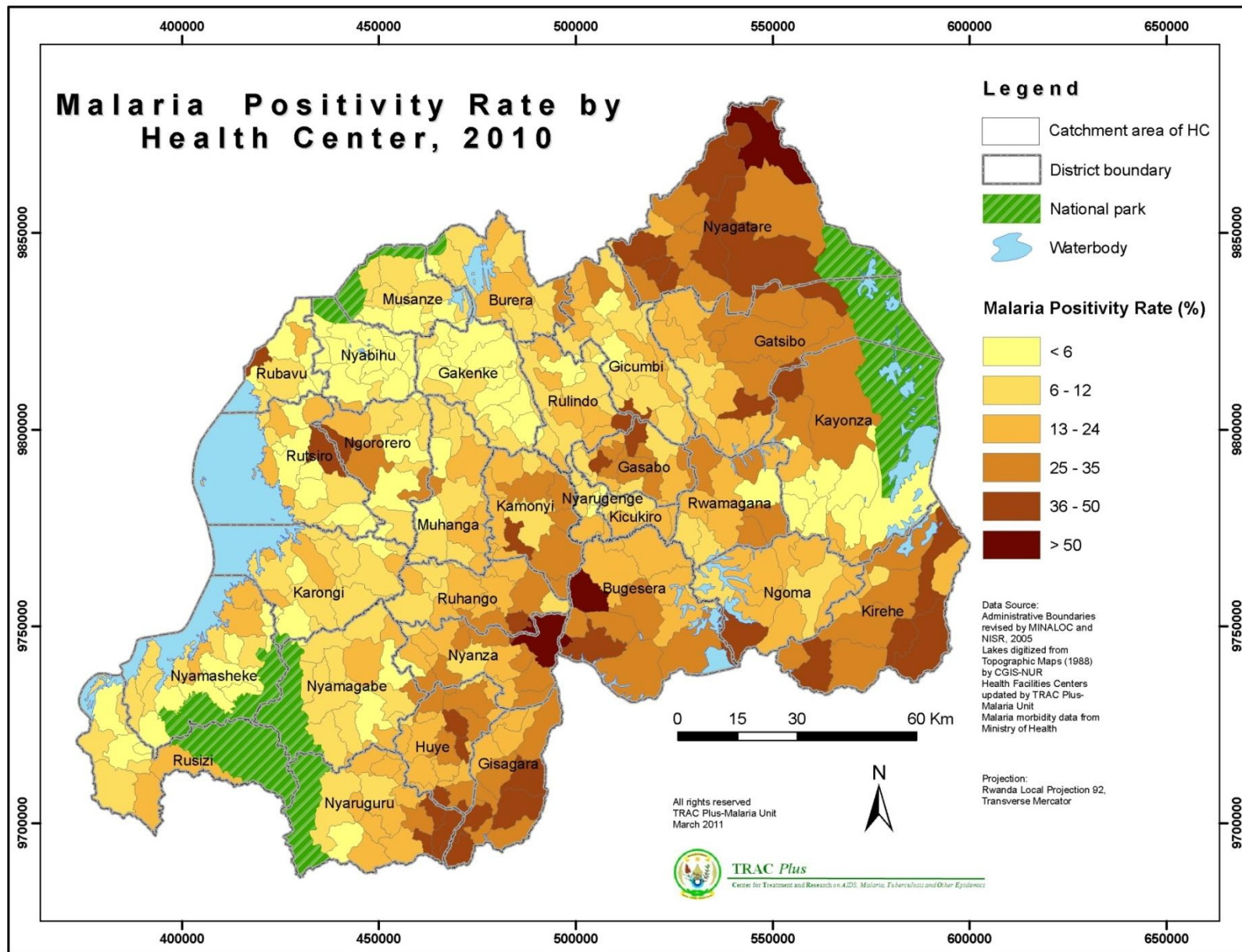
With

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Malaria situation in Rwanda

- Extraordinary progress in the fight against malaria
- Declining incidence
 - **70%** decline between 2005 & 2010;
- Declining morbidity
 - **60%** decline, Out patient cases between 2005 & 2010;
- Declining mortality
 - **54%** decline, Inpatients deaths between 2005 & 2010;
and
- Declining Test Positivity Rate
 - **66%** decline, between 2001 & 2010.



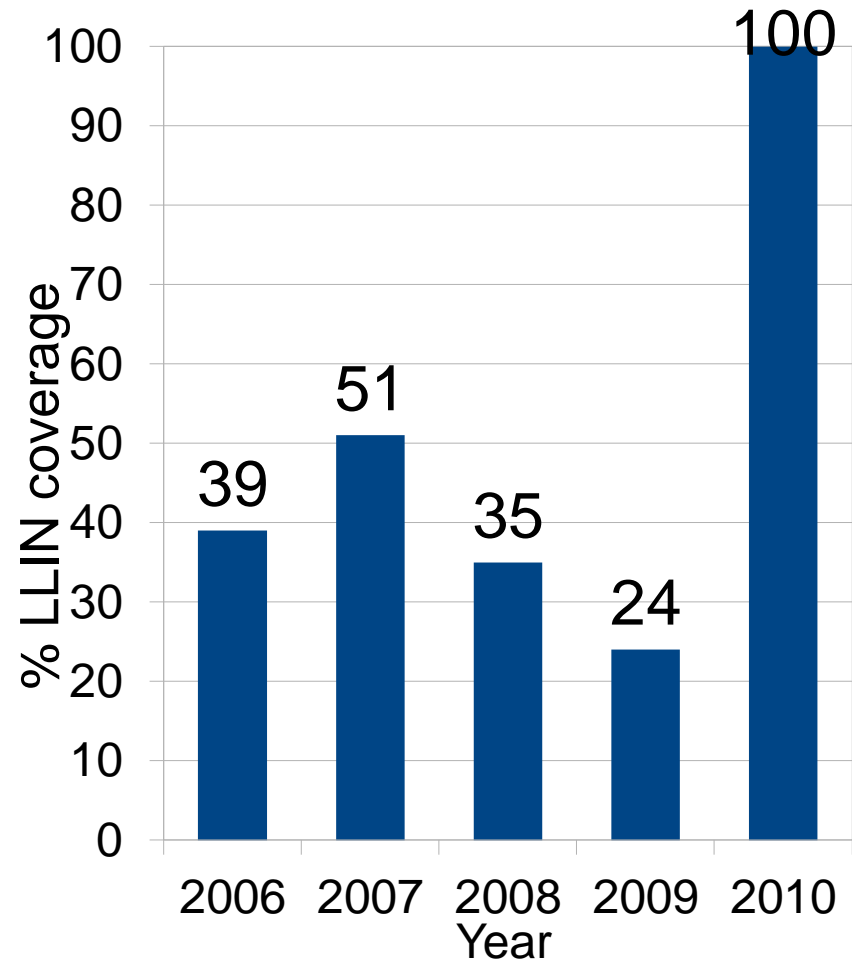
LLIN Challenges



- 2006: Scaled up LLIN, targeting children under 5 years old via integrated measles campaign achieved coverage $> 60\%$
- 2009: LLIN coverage decreased to $< 25\%$ resulting in upsurges in cases

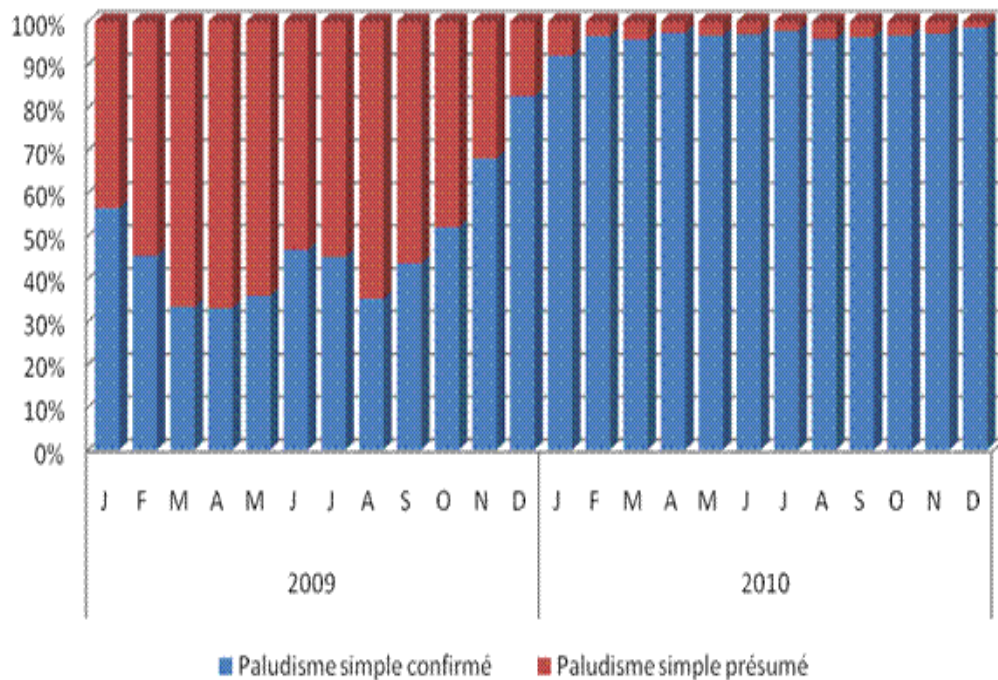
LLINs Achievements:

- Response: distribution of 6.1 million LLINs b/w 12/2009 & 2/2011, achieving universal coverage (UC) with LLINs
- DHS 2010-11 - 82% HH with at least one ITN
- Actual net use should reduce MIP

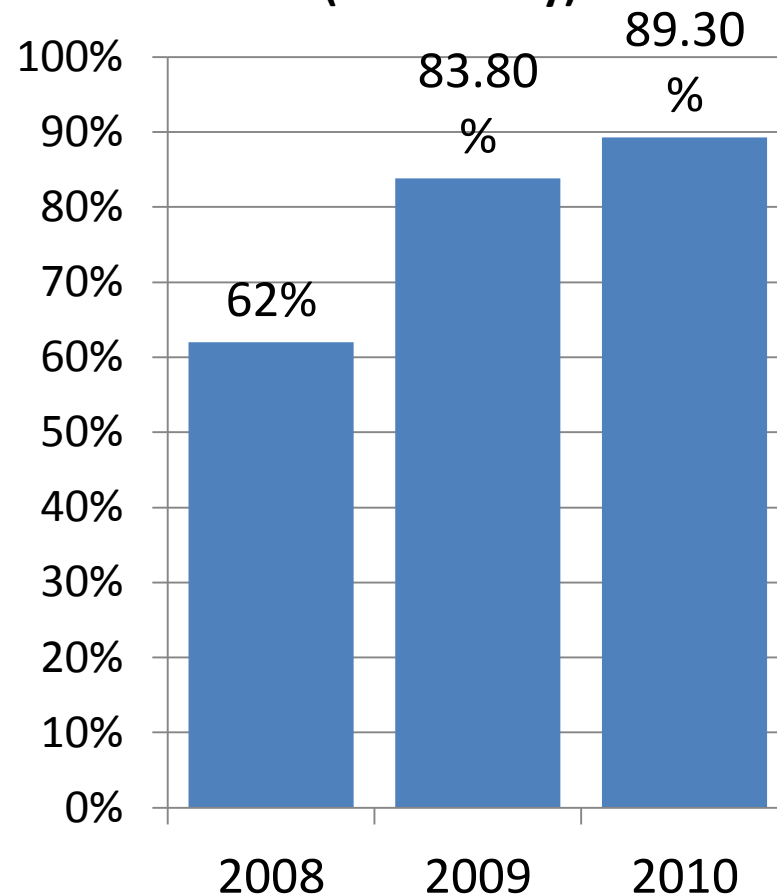


Case Management

Confirmed Malaria cases Vs Presumed from
2009-2010



Proportion of under five with
malaria/fever receiving
appropriate treatment within
24h (community)



In 2010, Rwanda has achieved one of the highest rates of parasitological diagnosis in Africa, with an estimated 94% of suspected malaria cases being parasitologically

Reaching Pregnant Women

- Malaria in pregnancy (MIP) poses serious risks to women, unborn children and newborns
- As Rwanda approaches malaria elimination, specific data on MIP prevalence is needed to inform appropriate preventive programs
- According to Rwanda's DHS 96% of pregnant women register for ANC in both rural and urban areas
- The population of pregnant women registering for the first time during their current pregnancy should be representative of the population of pregnant women and form the target for study

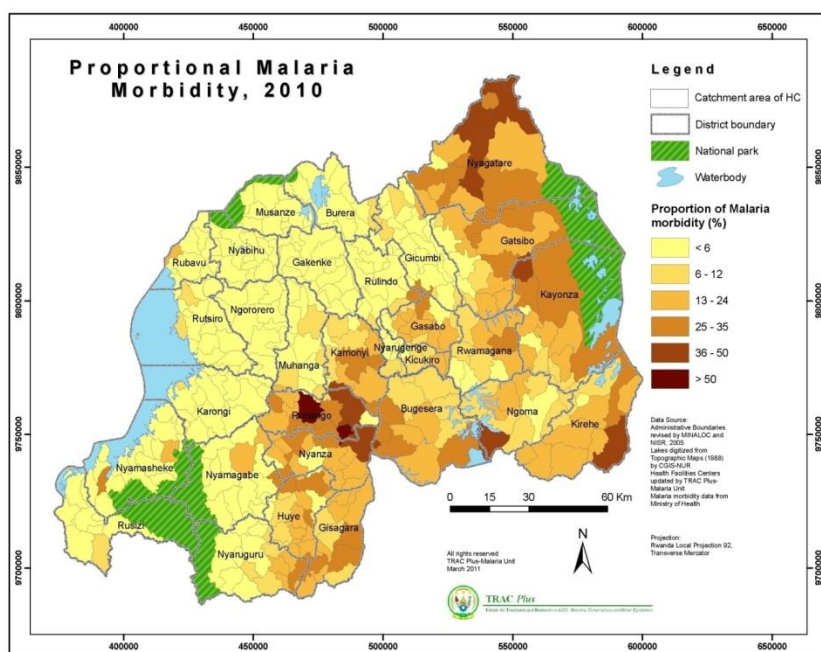
Today's Key MIP Questions

- Is it feasible to provide determine MIP prevalence through ANC attenders in Rwanda?
- Is the number of women for ANC registration adequate and representative?
- Do ANC clinic records capture malaria-relevant social and service data?
- Are there adequate human resources to test pregnant women for malaria?
- Will appropriate malaria tests be available?

Malaria Prevalence in Pregnancy

- In 2002 a study was conducted among 1432 pregnant women attending six health centres
- 13.6% overall prevalence of malaria infection by *Plasmodium falciparum*
- By 2008, DHS reports that malaria was
 - 2.4% among children <5 years of age (n=4662)
 - 1.4% among women 15-49 years of age (n=6842)
 - 0.9% for pregnant women (n=642)
- By 2010-11, Preliminary results of DHS reports that malaria was
 - 1.4% among children <5 years of age (n=4,036)
 - 0.7% among women 15-49 years of age (=n=6913)

Malaria Belt in 2010 from HMIS Case Reports (98% completeness)

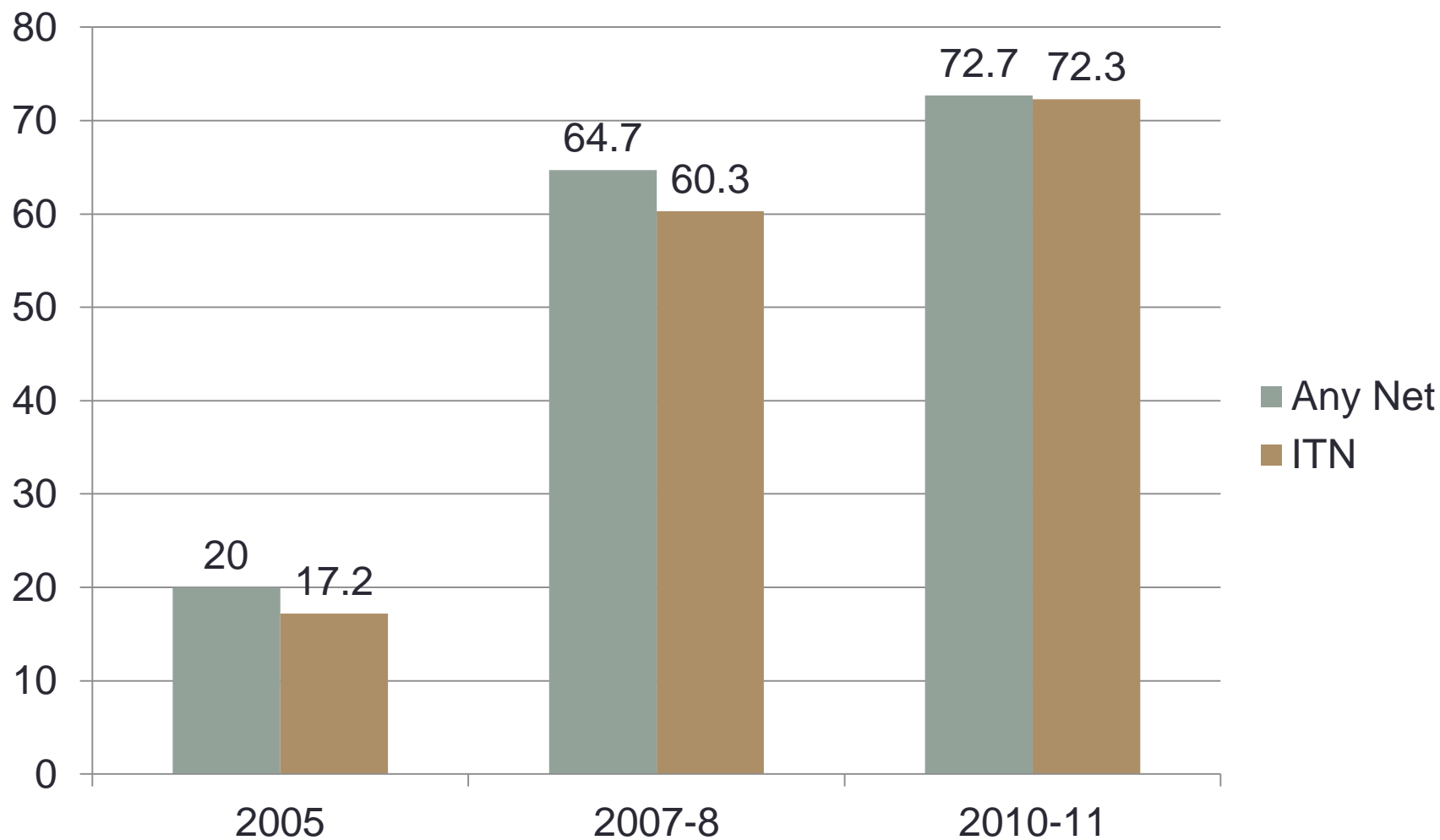


- 7 districts account for over 50% of the cases especially during the seasonal peaks
- Cases continued to drop in 2010 as LLINs and ACT case management widely implemented
- A prevalence study will provide a population denominator and thus a real measure of MIP prevalence

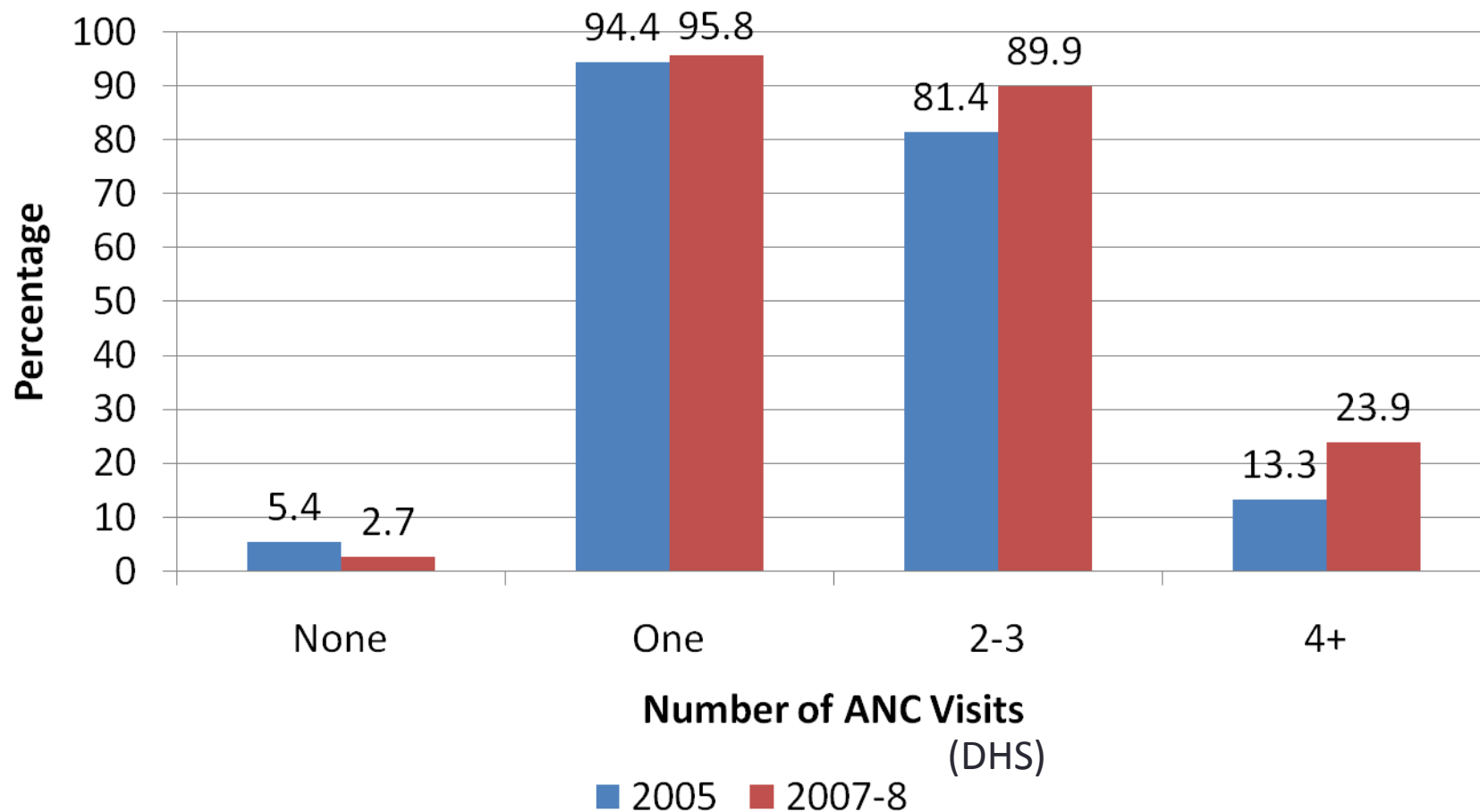
MIP Interventions in High, Stable Transmission Areas

- ✓ Sleeping under an insecticide treated bednet nightly from the beginning of pregnancy
- Taking intermittent preventive treatment with sulphadoxine-pyrimethamine at least twice after quickening (in stable transmission areas)
- ✓ Prompt diagnosis and appropriate case management for all malaria episodes
- Although not unique to pregnancy, IRS also offers protection to all living in the household
- ✓ = main MIP interventions in Rwanda, an area with low transmission

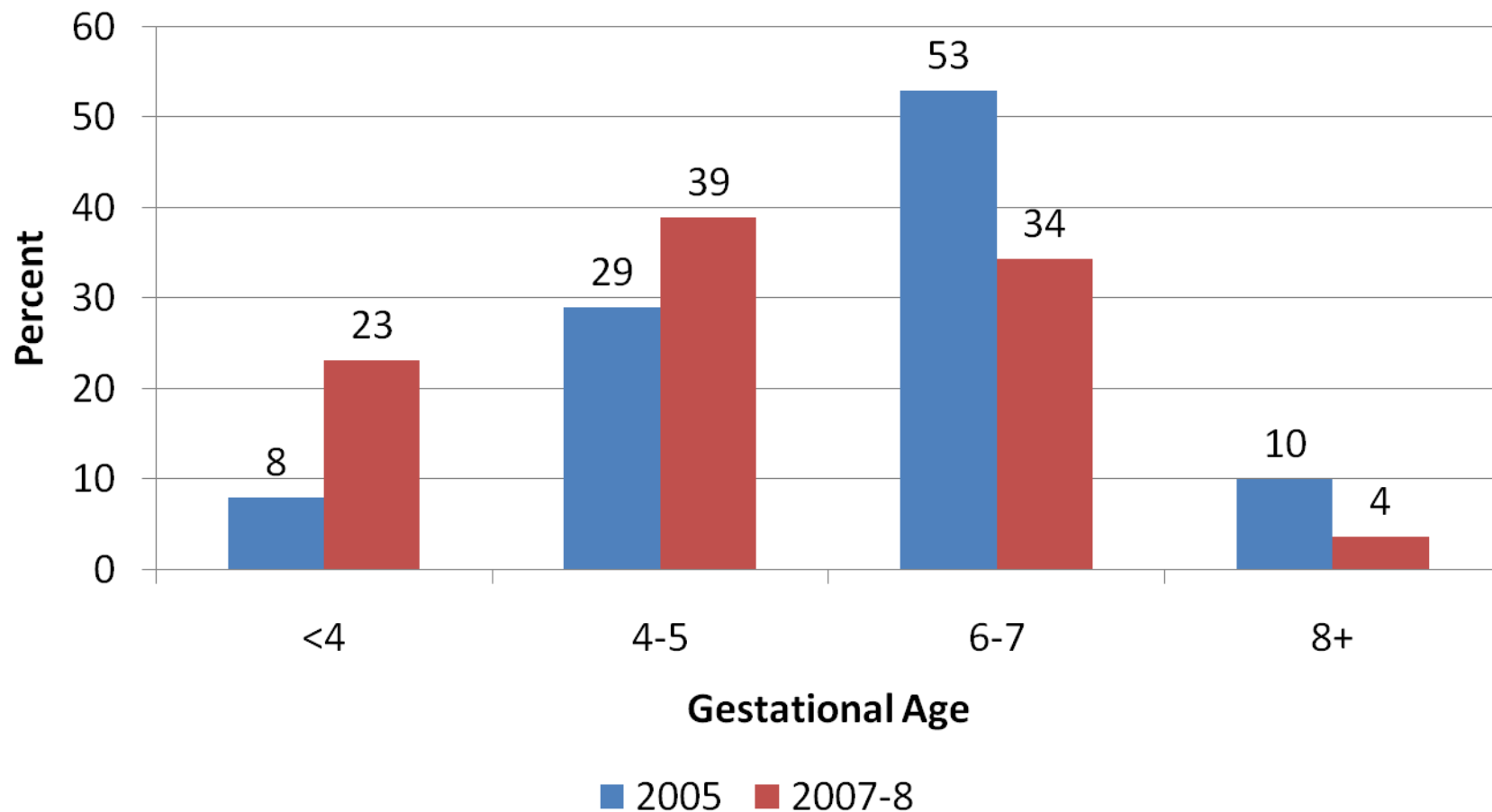
Pregnant Women Sleeping Under Bednet Night before DHS



ANC Reaches Most Pregnant Women – Feasible for Recruiting



Number of Months Pregnant When Register for ANC (DHS)



Proposed Sampling

- We used a precision of 0.5% and assumed a potential clustering effect when taking multiple samples from the same health facility
- Sample size estimates thereby ranged from 3,043 to 3,628
- Adding 10% in case of error, we are ultimately aiming for a sample of 4,000 pregnant women who are registering at ANC for the first time in their current pregnancy
- Considering the variation of reported malaria cases across the country, we intend to sample from ANC clinics in districts where HMIS shows relatively higher, lower and moderate proportions of malaria cases among total case load

ANC Population in Sample Districts

District	Endemicity Level	Number of Health Centers	Average monthly New ANC Clients
Musanze	Low	12	935
Burera	Low	15	839
Ruhango	Moderate	13	841
Kicukiro	Moderate	8	893
Nyanza	Higher	15	838
Gisangara	Higher	12	893
Total		75	5239

Other Feasibility Factors

- Human resources
 - Adequate ANC Staff and community health workers to train or re-train ANC staff to conduct RDTs
- Commodities
 - RDT provided through Partner support
 - Laboratory supplies normally available
- Data Collection
 - ANC registers and cards contain all needed data are collected except performance of RDT
 - Design data extraction form to accommodate these

Testing Processes

- Three testing procedures were considered
- Microscopy is available in clinics and is required in Rwanda now before giving ACTs
- Compare RDT, PCR, and microscopy for MIP
 - Although RDT is less effective than PCR, RDT is more realistic for an ANC setting
- The program will use RDTs and microscopy for immediate screening and treating, but collect PCR samples for a more accurate assessment of MIP prevalence

Key Variables

- Study site/location
- Date of ANC visit (month, season)
- Woman's age
- Gestational Age
- Parity
- History of Fever during current pregnancy
- History of malaria treatment during current pregnancy
- Reports of sleeping under ITNs
- RDT result
- Type of treatment provided, if any, for positive tests

Data Analysis and Reporting

- Basic Prevalence of Positive Test
- Comparison of test result and
 - Age, trimester, parity
 - Season, location
 - History of fever and fever treatment
 - Comparison among tests
- Data will be to be used for programming decisions

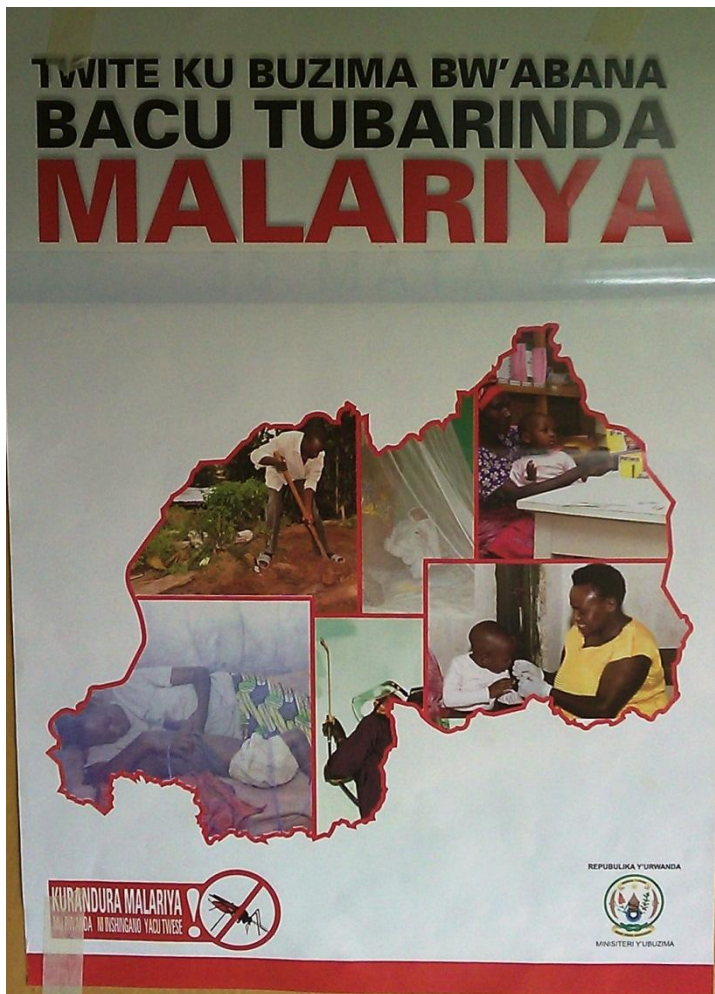


A Potential Intervention in Low Transmission Settings

- Unfortunately women with placental malaria may not exhibit signs of malaria
- Intermittent Screening and Treatment (IST) is an important option, especially to protect fetal wellbeing
- IST is appropriate for low, seasonal and/or unstable malaria transmission areas where adults do not develop immunity



Conclusions



- Determining MIP prevalence through use of RDTs during ANC is feasible
- RDT use in pregnancy could become the basis for an additional malaria control service, intermittent screening and treatment, for pregnant women