Wosera HDSS, Papua New Guinea
Introduction to Wosera HDSS

The Wosera HDSS was set up in 1990 as part of a larger research program for Malaria Vaccine Epidemiology and Evaluation in Papua New Guinea. It started with baseline investigation into malaria epidemiology and immunology investigations in 9 villages surrounding the Kunjigini Health Centre leading to a phase Ib trial of a 3 component malaria vaccine in 1995. The enormous value of the HDSS for malaria and other health research was quickly realized and in order to have capacity to concurrently run several studies in the area, the HDSS area rapidly expanded to 30 villages in 1995. The expansion went in hand with the building of extensive facilities both in the Wosera HDSS and at the IMR field base in Maprik, East Sepik Province.

The Wosera DSS includes 30 villages of in the Wosera/Gawi district, in the East Sepik Province of Papua New Guinea. Wosera HDDS lies approximately 75 km WSW of the provincial capital Wewak and is situated at 50-100m above sea level on the large alluvial plain situated between the Torricelli Mountains in the North and the flood plain of the Sepik River in the South and covers an area 12 km x 16 km. The Wosera DSS started in 1990 and is currently monitoring 16,000 people.

Objectives:

1. To collect accurate information on demography, health and survival;
2. To provide a framework for population-based health research relevant to local health priorities and needs, in particular the evaluation of malaria vaccines and other malaria interventions.

Priority Research areas

Malaria: basic science research, bed-net evaluation, vaccine trials, drug interventions
Mother and Child Health/IMCI Health policy monitoring (from 2008 onward)

Ongoing key projects:

Birth Outcome and Vaccination Survey
Since the Wosera HDSS has got reliable longitudinal data at the community level, the National Health Department of PNG has requested the Wosera HDSS to carry out surveys to determine the vaccination coverage to report to GAVI for vaccine application. Vaccination coverage survey was conducted within the HDSS and will repeat every 2 years.

Global Fund Evaluation program: National Bednet Survey programme
The Bednet survey program conducted in the Wosera HDSS is part of the National Department of Health programme aimed at evaluating and monitoring the bednet coverage in the country (PNG), and is funded by Global Fund. In order to get a clear
picture of the bednet coverage at the national and local scale thus the bednet survey was also conducted within the Wosera HDSS from December 2008-February 2009. The survey took 6 weeks to get it completed. This survey has been scheduled to repeat 3 years later.

The Wosera HDSS Annual Census Programme
The annual census review within the Wosera HDSS is an ongoing activity since mid 1990, and normally starts in the March-April. After the annual census review, subsequent updates by village based reporters followed. During the update vital events like new births, deaths, new marriage, housing changes, migration (internal or external) were documented. However, future plans for the Wosera HDSS would be to look at incorporating other health surveys for instance looking at collecting data on health seeking behavior, socio-economic statutes, water quality control, and others.

The Cause of death study
This is the collaboration with the School of Population Health, University of Queensland. The new VA form is introduced and the data are coded by the physician and analyzed by the computerized program. This study will start in 2012.

National collaborators
- Department of Health, PNG
- Catholic Health Service

International Collaborators
- INDEPTH Network
- Case Western Reserve University
- Walter and Eliza Hall Institute of Medical Research
- AusAID

Sources of Funding
- Government of Papua New Guinea,
- Australian Agency for International Development (AusAID)
- Bill & Melinda Gates Foundation (BMGF)
- National Institutes of Health (NIH, USA)
- National Health & Medical Research Council (NHMRC, Australia)
- Swiss National Science Foundation (SNSF),
- World Health Organization,
- Exxon Mobile (incoming in 2012)
Publications

Socio-demographic factors associated with maternal healthcare utilization in Wosera, East Sepik Province, Papua New Guinea

Intermittent Preventive Treatment for Malaria in Papua New Guinean Infants Exposed to *Plasmodium falciparum* and *P. vivax*: A Randomized Controlled Trial


High-throughput molecular diagnosis of circumsporozoite variants VK210 and VK247 detects complex *Plasmodium vivax* infections in malaria endemic populations in Papua New Guinea.

Multilocus haplotypes reveal variable levels of diversity and population structure of *Plasmodium falciparum* in Papua New Guinea, a region of intense perennial transmission.

Mapping the prevalence of malaria in rural Papua New Guinea using a
geographic information system.

Beyond risk factors to lived experiences: young women's experiences of health in Papua New Guinea.

Three different Plasmodium species show similar patterns of clinical tolerance of malaria infection.

Glycophorin C delta(exon3) is not associated with protection against severe anaemia in Papua New Guinea.

The usefulness of twenty-four molecular markers in predicting treatment outcome with combination therapy of amodiaquine plus sulphadoxine-pyrimethamine against falciparum malaria in Papua New Guinea.

A multiplex ligase detection reaction-fluorescent microsphere assay for simultaneous detection of single nucleotide polymorphisms associated with Plasmodium falciparum drug resistance.

Changing patterns of Plasmodium blood-stage infections in the Wosera region of Papua New Guinea monitored by light microscopy and high throughput PCR diagnosis.

Parvovirus B19 infection contributes to severe anemia in young children
Plasmodium falciparum: distribution of msp2 genotypes among symptomatic and asymptomatic individuals from the Wosera region of Papua New Guinea.

Glycophorin C (Gerbich antigen blood group) and band 3 polymorphisms in two malaria holoendemic regions of Papua New Guinea.

Engaging the community in research: lessons learned from the malaria vaccine trial.

Geographical structure of diversity and differences between symptomatic and asymptomatic infections for Plasmodium falciparum vaccine candidate AMA1.

The association of the glycophorin C exon 3 deletion with ovalocytosis and malaria susceptibility in the Wosera, Papua New Guinea.

Area effects of bednet use in a malaria-endemic area in Papua New Guinea.

The influence of zinc supplementation on morbidity due to Plasmodium falciparum: a randomized trial in preschool children in Papua New Guinea.
Comparison between anopheline mosquitoes (Diptera: Culicidae) caught using different methods in a malaria endemic area of Papua New Guinea.


Influence of age and HLA type on interferon-gamma (IFN-gamma) responses to a naturally occurring polymorphic epitope of Plasmodium falciparum liver stage antigen-1 (LSA-1).


Effect of vitamin A supplementation on morbidity due to Plasmodium falciparum in young children in Papua New Guinea: a randomised trial.


Relation of anthropometry to malaria morbidity and immunity in Papua New Guinean children.


Naturally acquired cellular immune responses to the synthetic malarial peptide SPf66 in children in Papua New Guinea.


Spatial and temporal variation in abundance of Anopheles (Diptera:Culicidae) in a malaria endemic area in Papua New Guinea.


Glucose-6-phosphate dehydrogenase deficiency mutations in Papua New Guinea.


Occurrence of the erythrocyte band 3 (AE1) gene deletion in relation to
malaria endemicity in Papua New Guinea.

Infant mortality in a deprived area of Papua New Guinea: priorities for antenatal services and health education.

Relative repellency of woodsmoke and topical applications of plant products against mosquitoes.

Acquired antibody levels to Plasmodium falciparum merozoite surface antigen 1 in residents of a highly endemic area of Papua New Guinea.

The epidemiology of malaria in the Wosera area, East Sepik Province, Papua New Guinea, in preparation for vaccine trials. II. Mortality and morbidity.

The epidemiology of malaria in the Wosera area, East Sepik Province, Papua New Guinea, in preparation for vaccine trials. I. Malariometric indices and immunity.

Smoke as a form of personal protection against mosquitoes, a field study in Papua New Guinea.

Childbirth in rural areas: maternal deaths, village deliveries and obstetric service use.

An algorithm to estimate age in women during their childbearing

