



Malaria Situation in Lao PDR and Insecticide used



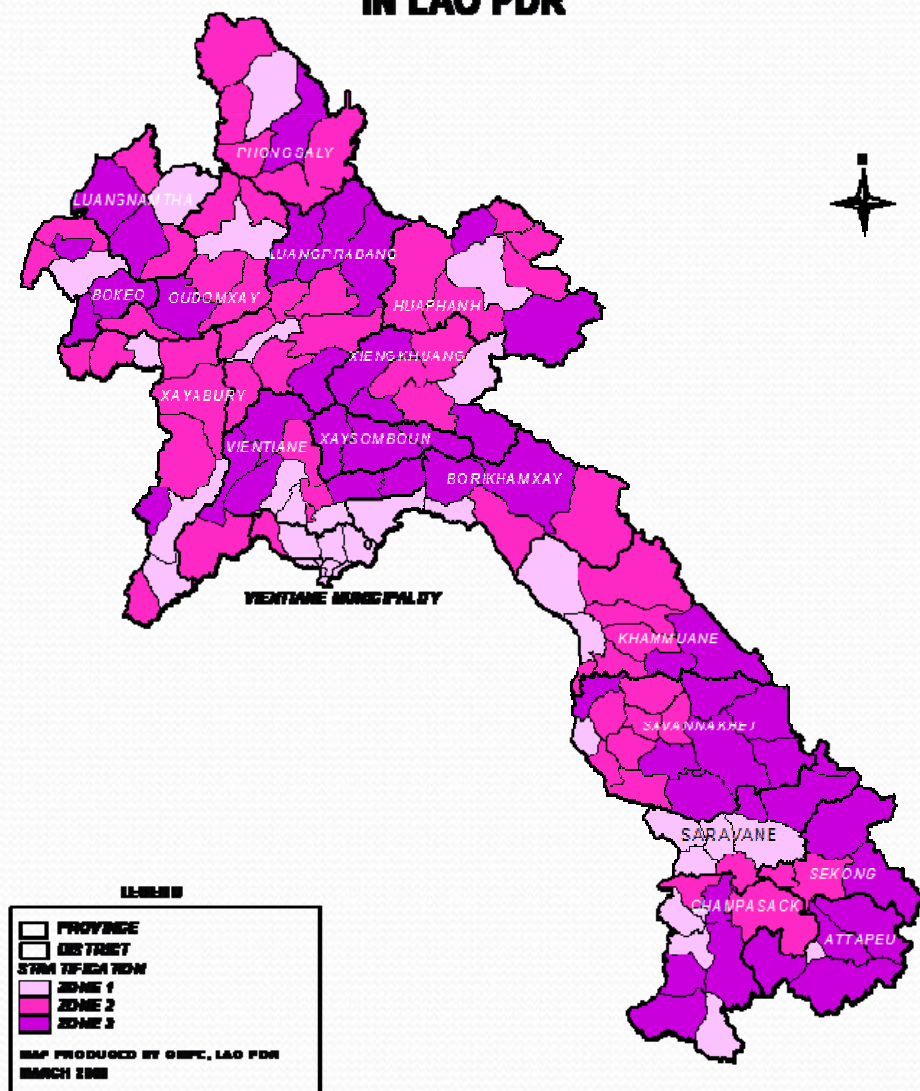
Stratification of malaria:

Classifying areas according to the risk of malaria and extent of transmission, is an essential component for developing effective malaria control strategies.

Background

- The last stratification of malaria in the Lao PDR was performed in 1997.
- This stratification was based on data from most provinces up to district level only based on cases detected by microscopy (hospital and some health centres).
- This stratification model was used as baseline for the R1 and R4 GFATM grant (ie – estimated 3.6 million people at risk).

STRATIFICATION OF MALARIA ENDEMIC AREAS IN LAO PDR



The last stratification of malaria in the Lao PDR which classified the different zones was performed in 1997.

An updated map was produced in 2003. However, the methodology is not available.

The district was adopted as basic/lowest unit for stratification.

Strata	Characteristics	Level of malaria risk Recommended interventions
<p><u>Zone 1 A</u> Low endemicity areas, with some malaria free zones</p> <p><u>Zone 1 B</u></p>	<ul style="list-style-type: none"> - Low malaria transmission - Districts mainly located along the Mekong River with possible fringe forest - Well developed health services and road network - High socio-economic level - Main vectors: <i>An. minimus</i> and <i>An. maculatus</i> - Hypoendemic or almost malaria free - Mountainous areas above 1000 m - Poor communities, located far from health services and roads 	<p>Low risk or No risk in the malaria free zones</p> <p>Estimated No.of Districts in zone 1: 33</p> <p>Total population living in the 33 Districts: 1,874,204 (36%)</p> <p>zone 1A free: 5 (386,471 people)</p> <p>zone 1A: 26 (1,426,843 people)</p> <p>zone 1B: 2 (60,890 people)</p>
<p><u>Zone 2</u> Moderate endemicity areas</p>	<ul style="list-style-type: none"> - Moderate malaria transmission with higher levels in some restricted zones - Plain area below 400 m, with fringe forests - Limited health services in rural areas - Mostly domicile of the Lao Loum ethnic groups - Medium socio-economic level and good roads - Main vectors: <i>An. minimus</i>, <i>An. maculates</i>, 	<p>Moderate risk</p> <p>Estimated No.of Districts in zone 2: 56</p> <p>Total population living in the 56 Districts: 1,944,705 (37%)</p>
<p><u>Zone 3</u> High endemicity areas</p>	<ul style="list-style-type: none"> - Meso to hyperendemic areas, malaria transmission all year round with peaks at the beginning and end of the rainy season - Plateau with altitudes between 400-1000 m, deep forest - Mostly domicile of the Lao Theung ethnic groups - Poor communities far away from health services and very limited road communication - Main vectors: <i>An. minimus</i>, <i>An.dirus</i>, <i>An. maculatus</i>, <i>An. jeyporensis</i> 	<p>High risk</p> <p>Estimated No. of Districts in zone 3: 53</p> <p>Total population living in the 53 Districts: 1,356,514 (27%)</p>

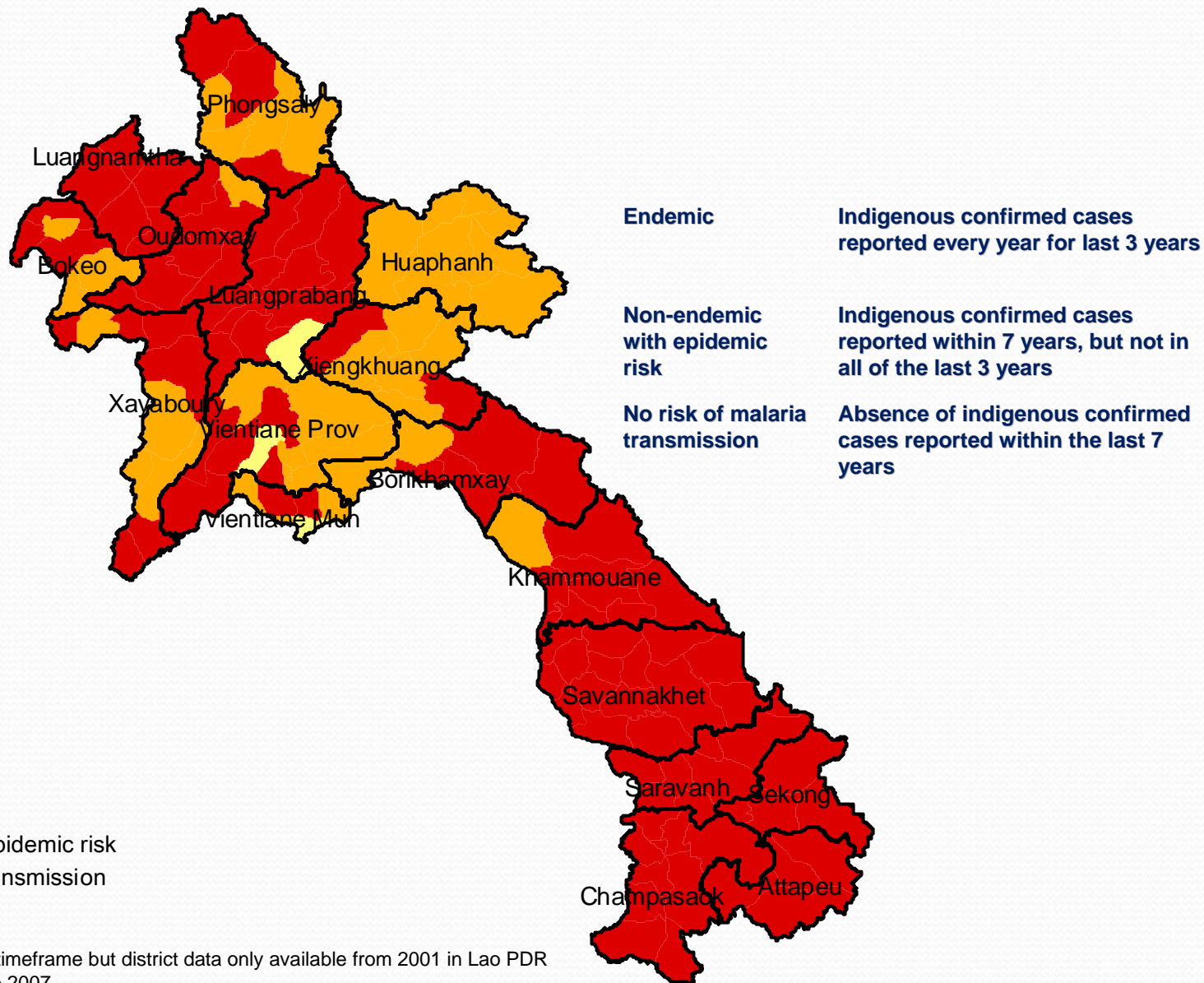
Insecticides have been used in Laos

- **DDT : up to 1989,**
- **Permethrin : from 1990 – 1994**
- **Deltamethrine (K-Othrine). 1995 up to date.**

2003 up to date

- **Long Lasting Net.**
- **Permernet**

Malaria endemic areas based on WHO criteria



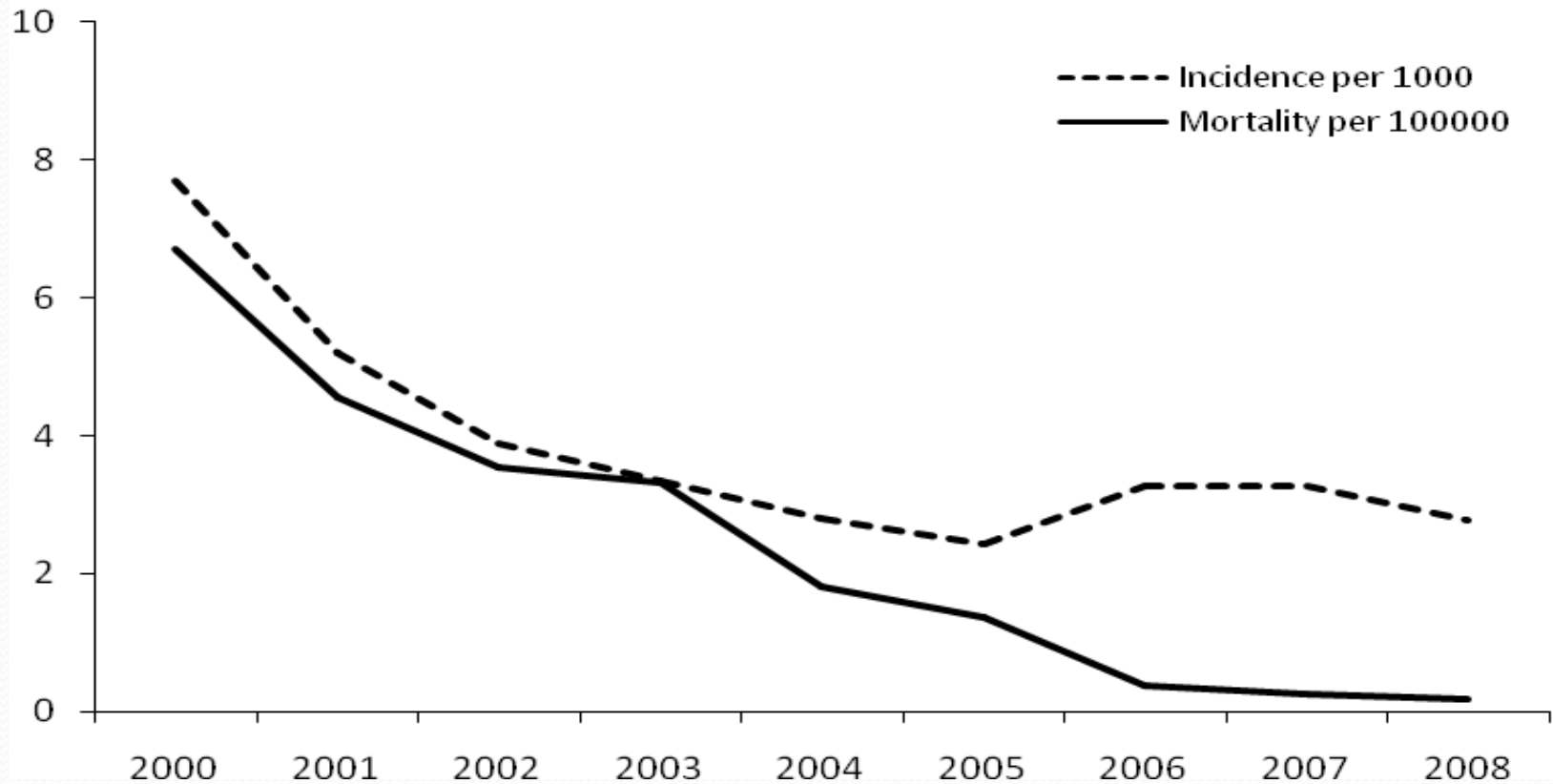
WHO endemicity criteria

- Endemic
- Non-endemic with epidemic risk
- No risk of malaria transmission

Note: WHO suggests a 10 year timeframe but district data only available from 2001 in Lao PDR
 Map based on data from 2001 to 2007

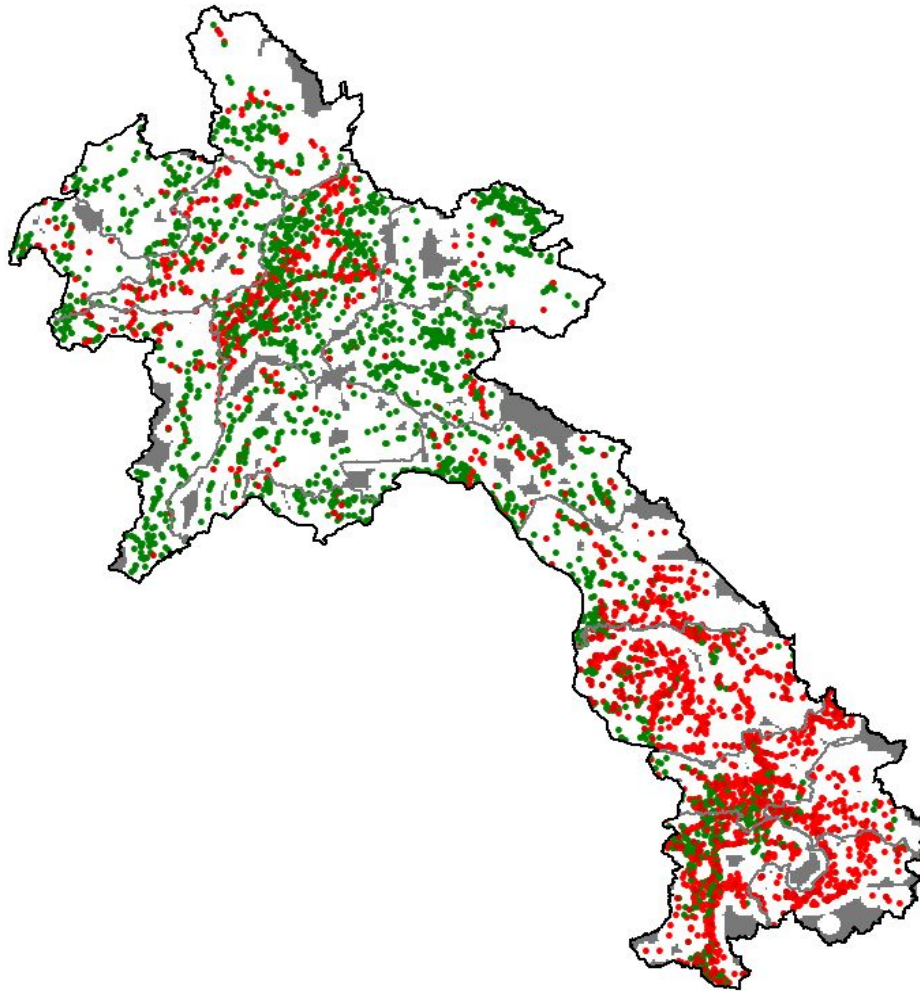
Malaria has decreased almost by 50% during this eleven year (2000 – 2008) period.

Incidence rate of confirmed malaria and mortality rate of probable and confirmed malaria in the Lao People's Democratic Republic, 2000-2008



A re-stratification of malaria, is necessary now to determine areas and population at risk.

**Confirmed *P. falciparum* cases by villages and health centres
with rapid diagnostic tests, 2006 and 2008**



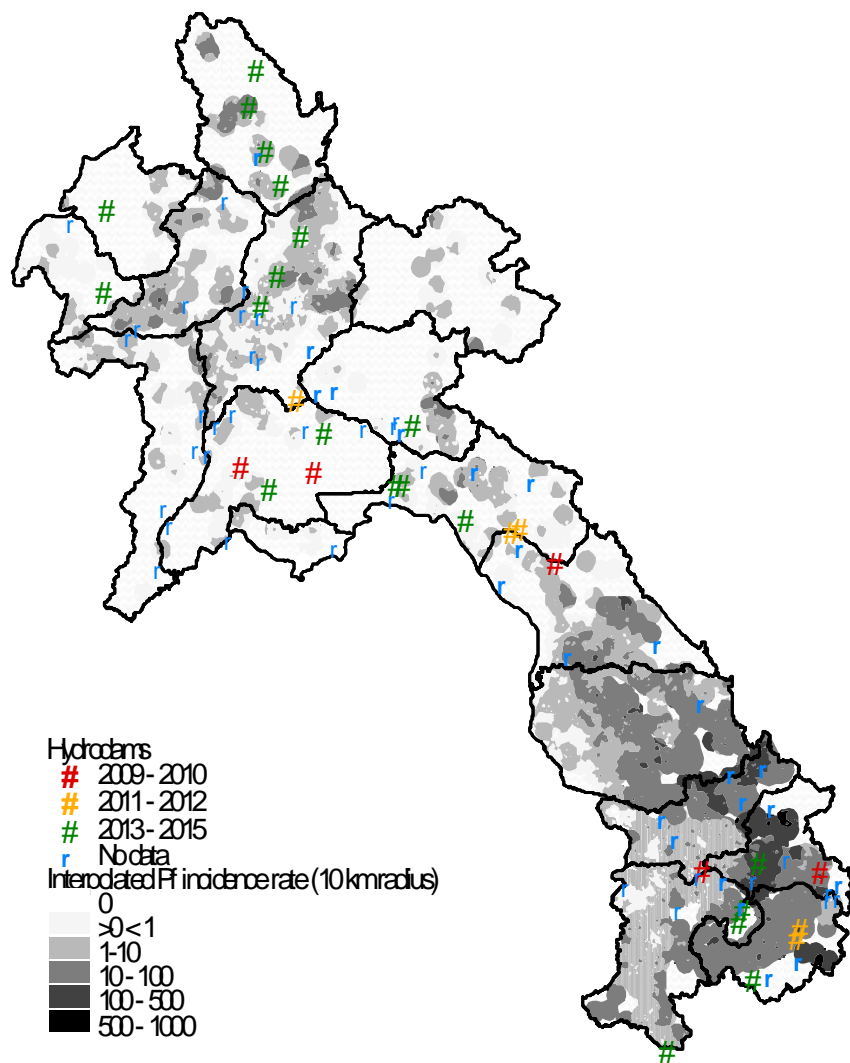
Red dot: Village or health centre with at least one confirmed *P. falciparum* case between 2006 and 2008
Green dot: Village or health centre with no confirmed *P. falciparum* cases between 2006 and 2008

Source: CMPE, 2009

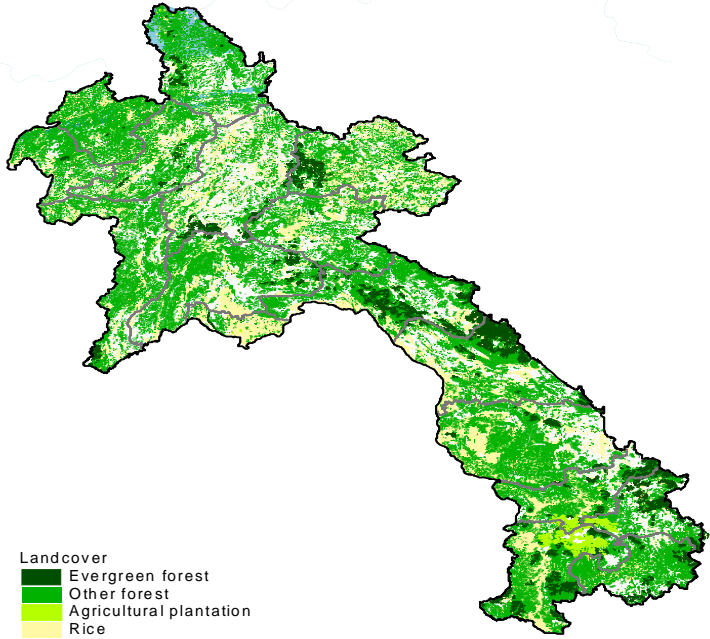
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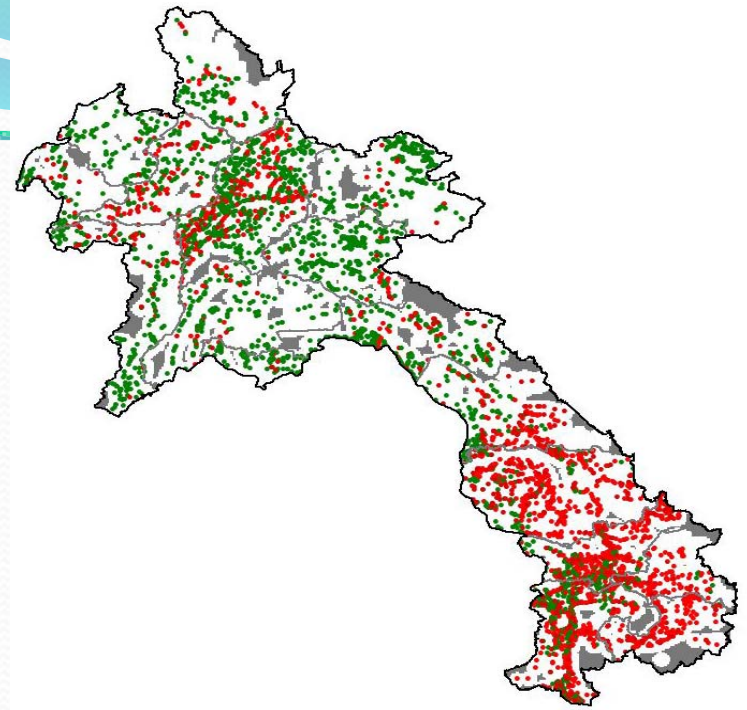
Grey areas – No data



Location of proposed hydro dams with projected year of construction, Lao People's Democratic Republic. Source: The Mekong River Commission, Vientiane, Lao PDR, September 2008.

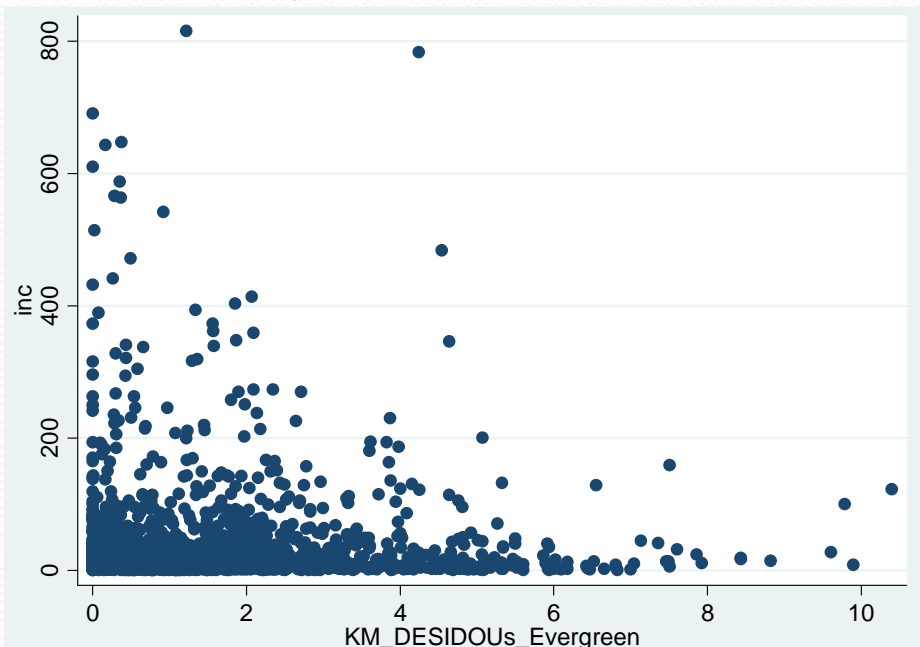


Landcover
 Evergreen forest
 Other forest
 Agricultural plantation
 Rice



Source: Division of Forest Inventory and Planning,
 Ministry of Agriculture and Forestry, Vientiane, Lao PDR. Data from 2000.
 White areas signify "other landuse"

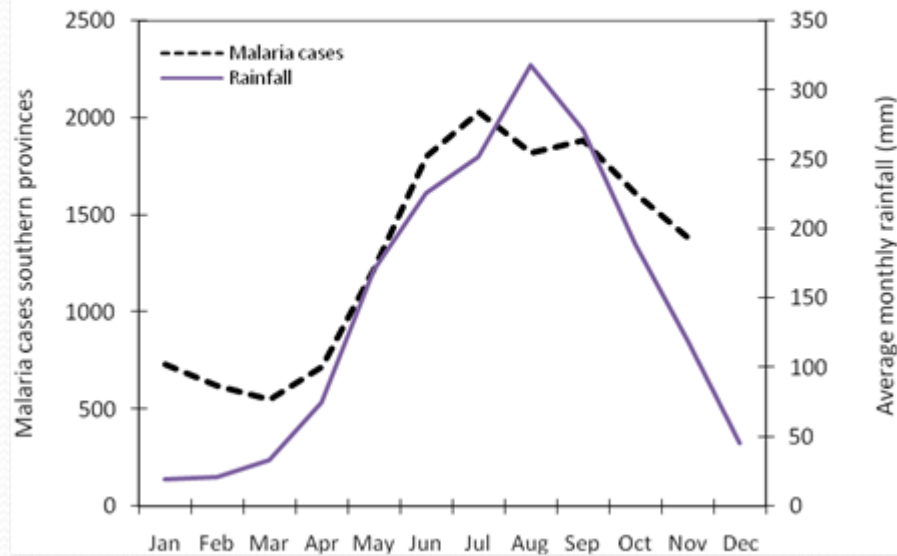
Source: CMPE, 2009



Forest and land use

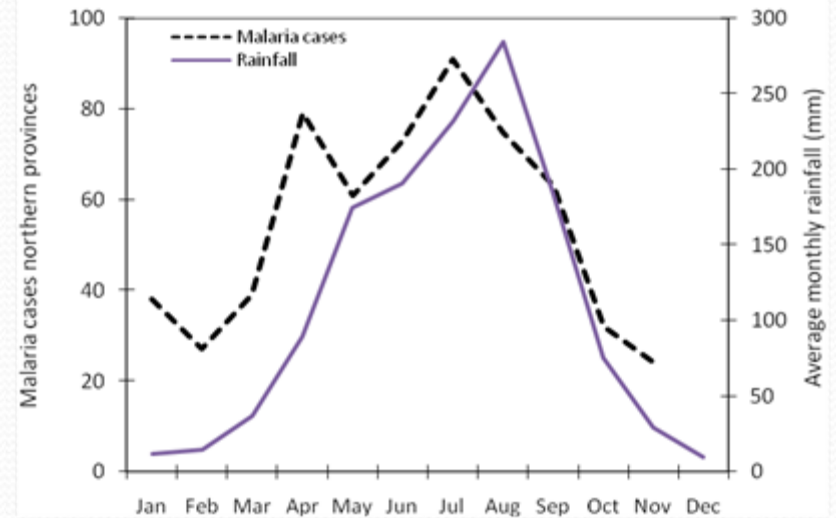
Monthly incidence of *P. falciparum* in 2008 with average monthly rainfall in the northern and southern part of the country

Total number of *P. falciparum* cases by month reported in 2008 in the southern provinces of Lao PDR and average monthly rainfall



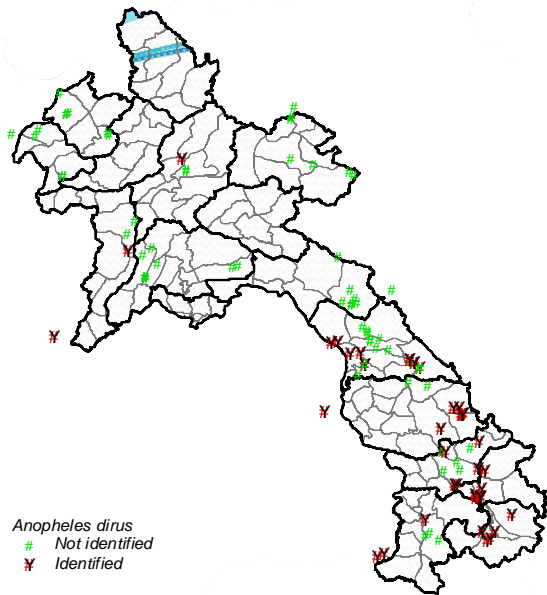
South

Total number of *P. falciparum* cases by month reported in 2008 in the northern provinces of Lao PDR and average monthly rainfall



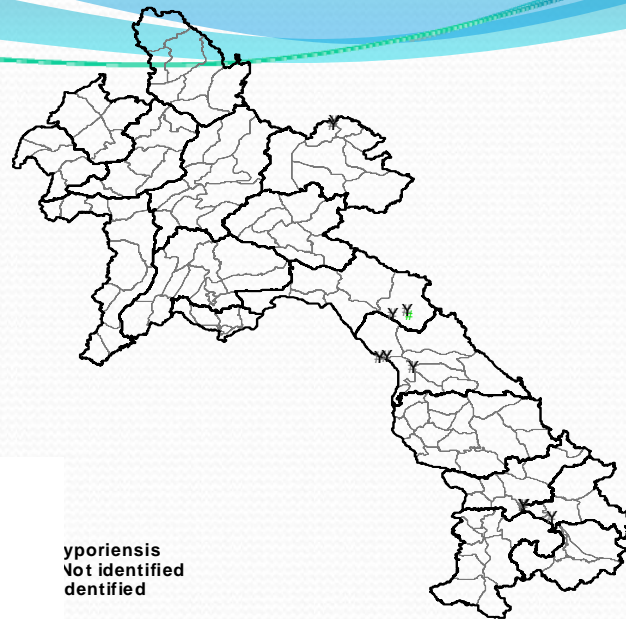
North

Vector distribution

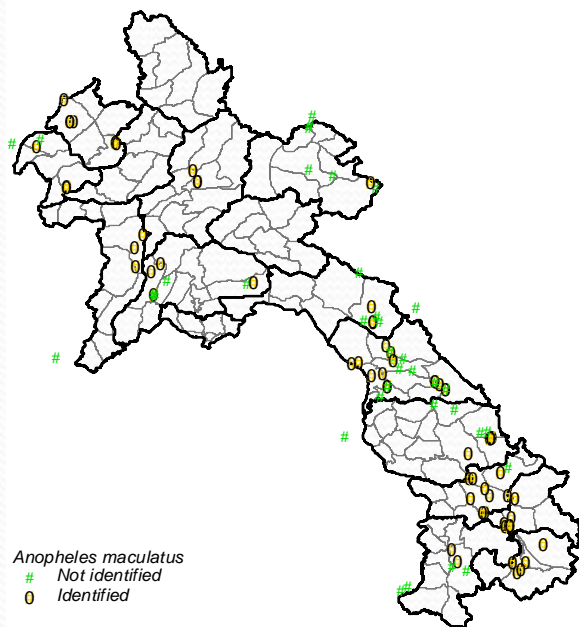
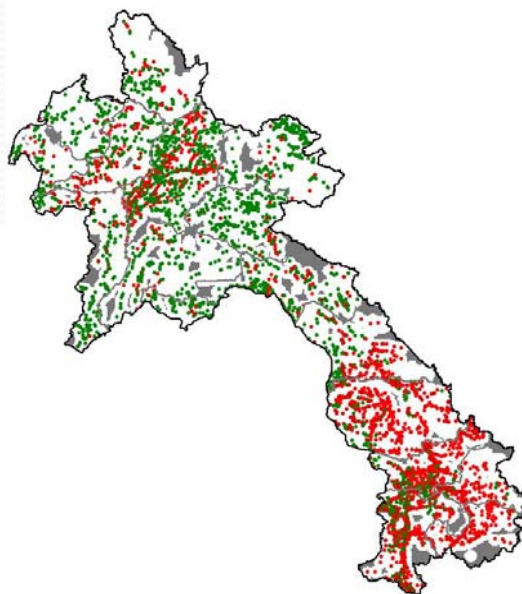


Anopheles dirus
Not identified
Identified

Source: CMPE, 2009

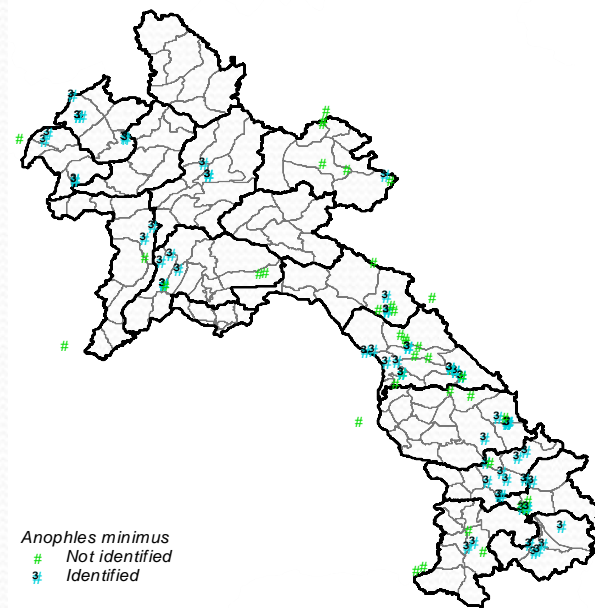


yporiensis
Not identified
Identified



Anopheles maculatus
Not identified
o Identified

Source: CMPE, 2009



Anopheles minimus
Not identified
* Identified

Source: CMPE, 2009







Thank you