

**AMAZON MALARIA INITIATIVE (AMI)  
AMAZON NETWORK FOR THE SURVEILLANCE OF  
ANTIMALARIAL DRUG RESISTANCE (RAVREDA)  
XXII Annual Evaluation Meeting  
Lima, Peru  
9 to 11 April 2013**

**Review of the malaria situation & strategies in  
Guyana-2011-2012**



**Dr. Reyaud Rahman / Dr. Nicolas Ceron**

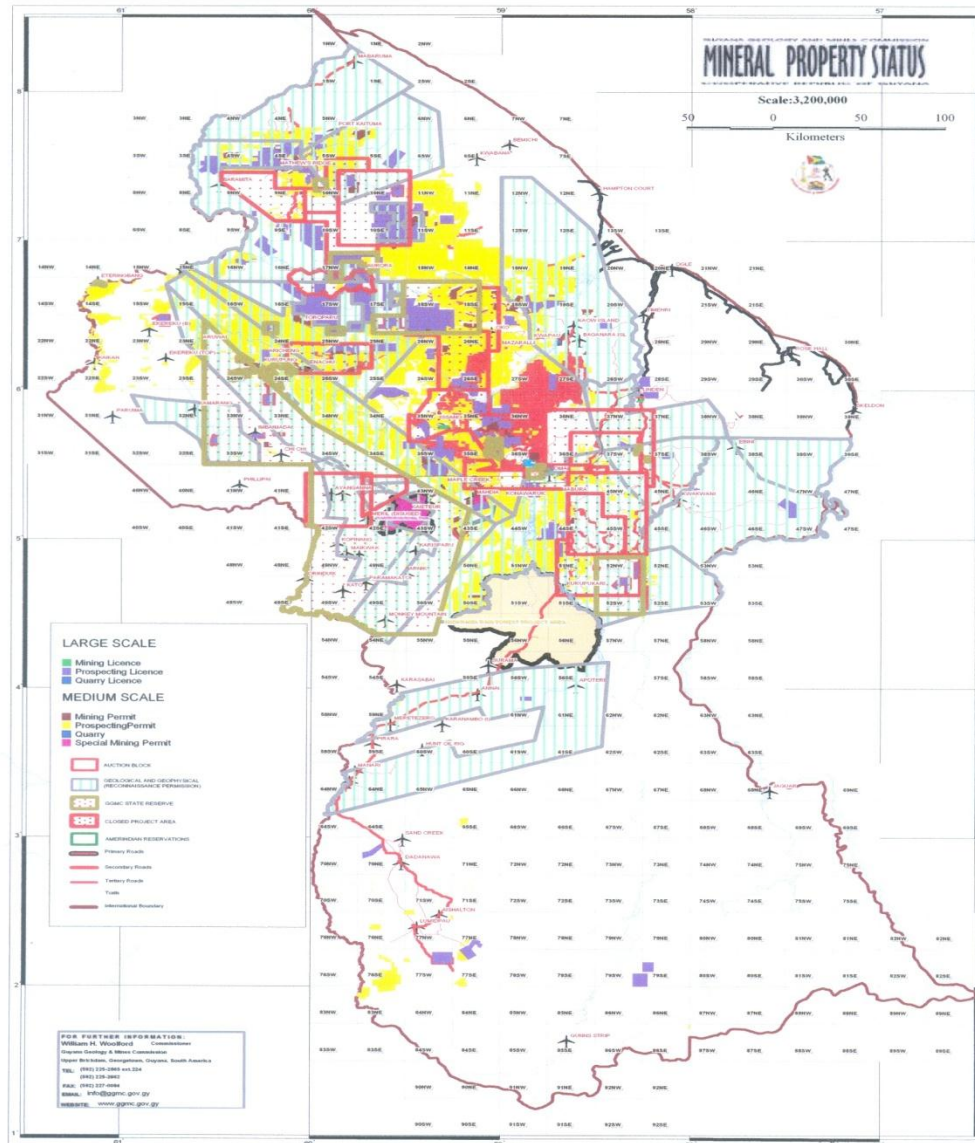




Mining is high investment and high producing sector that generates important foreign exchange earning for the Guyanese Economy

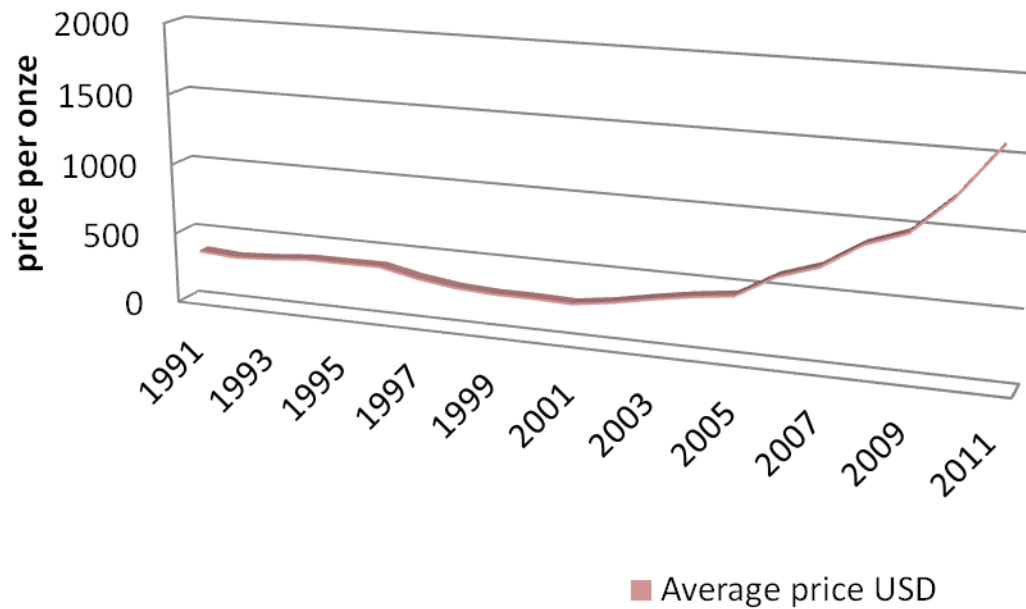
- In 2008 the mineral production (Output) G\$ 73,113 Billions (18% over more than 2007)
- Gold production continued to rise in 2009-2011, by small and medium Scale Guyanese miners continue to be strong in 2009 the production of Gold surpassing from 260000 in 2008 to 305,000 oz. in 2009, & 2010.

# Mining and Logging activities in the endemics regions, Guyana



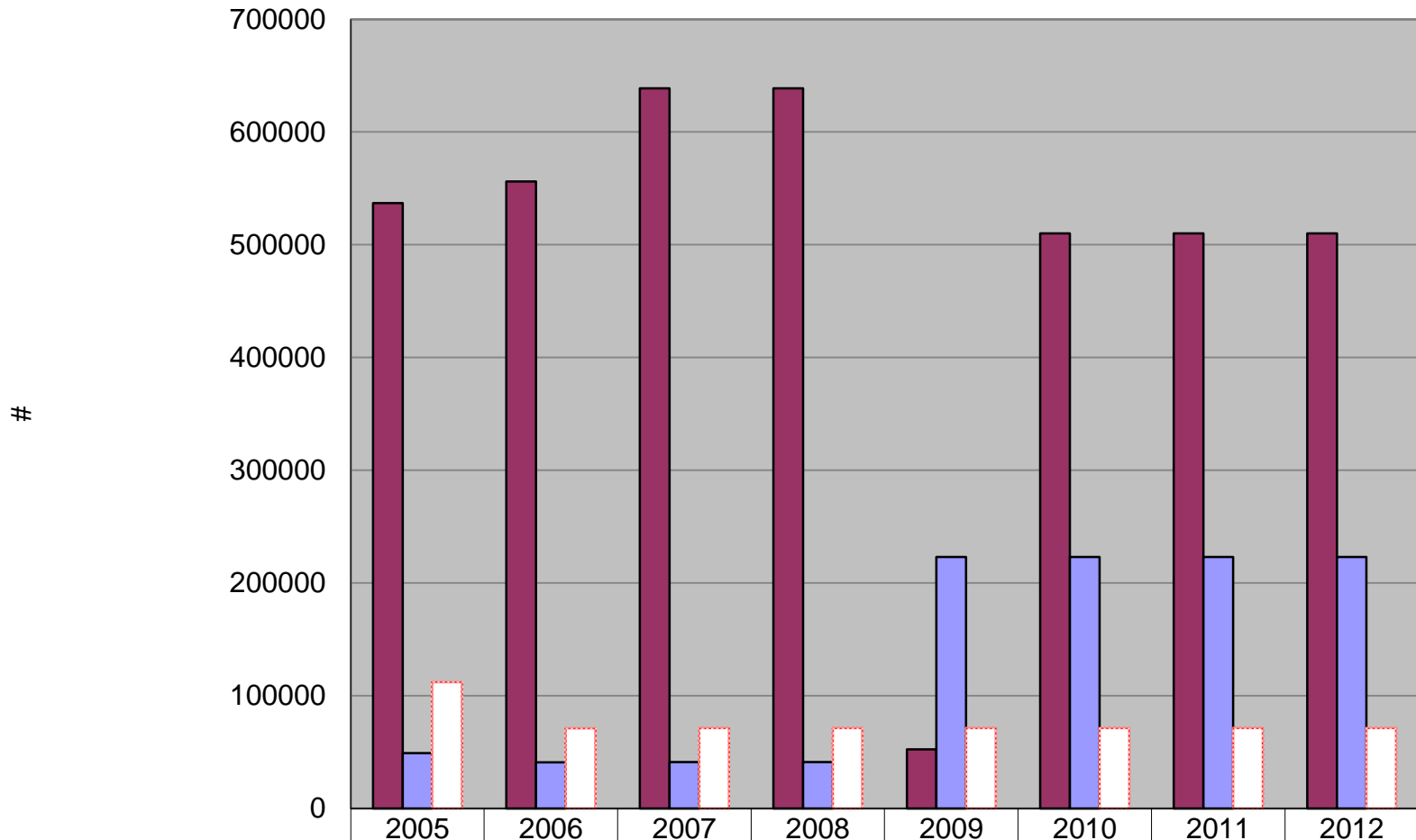
Increase of mining and logging operation between 15 – 20 %

## Historical gold prices



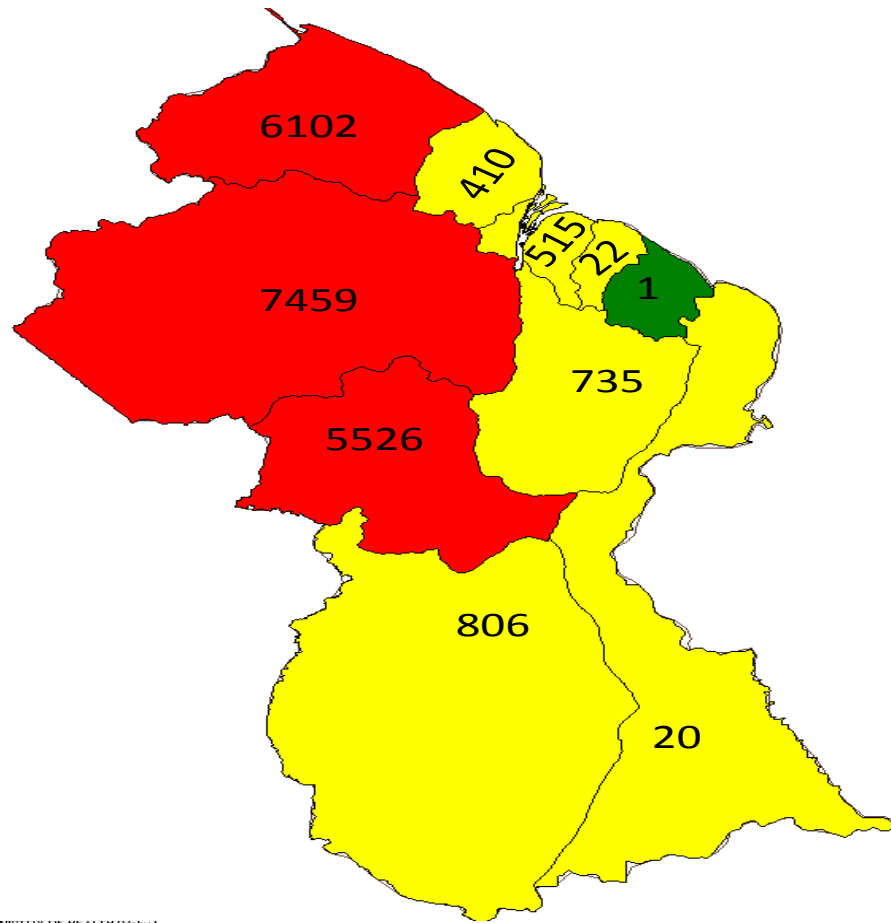
Taken from Timothy Green's Historical Gold Price table London Prices converted to USD

Guyana Population at risk of Malaria 2005-2012



■ Low risk Population	537000	556000	638,757	638,757	52428	509,945	509,945	509,945
■ Medium risk Population	49000	41000	41112	41,112	223,095	223,095	223,095	223,095
□ High risk Population	112000	71000	71354	71,354	71,354	71,354	71,354	71,354

# Malaria Risk area Guyana up to Epidemiological week 1 - 52



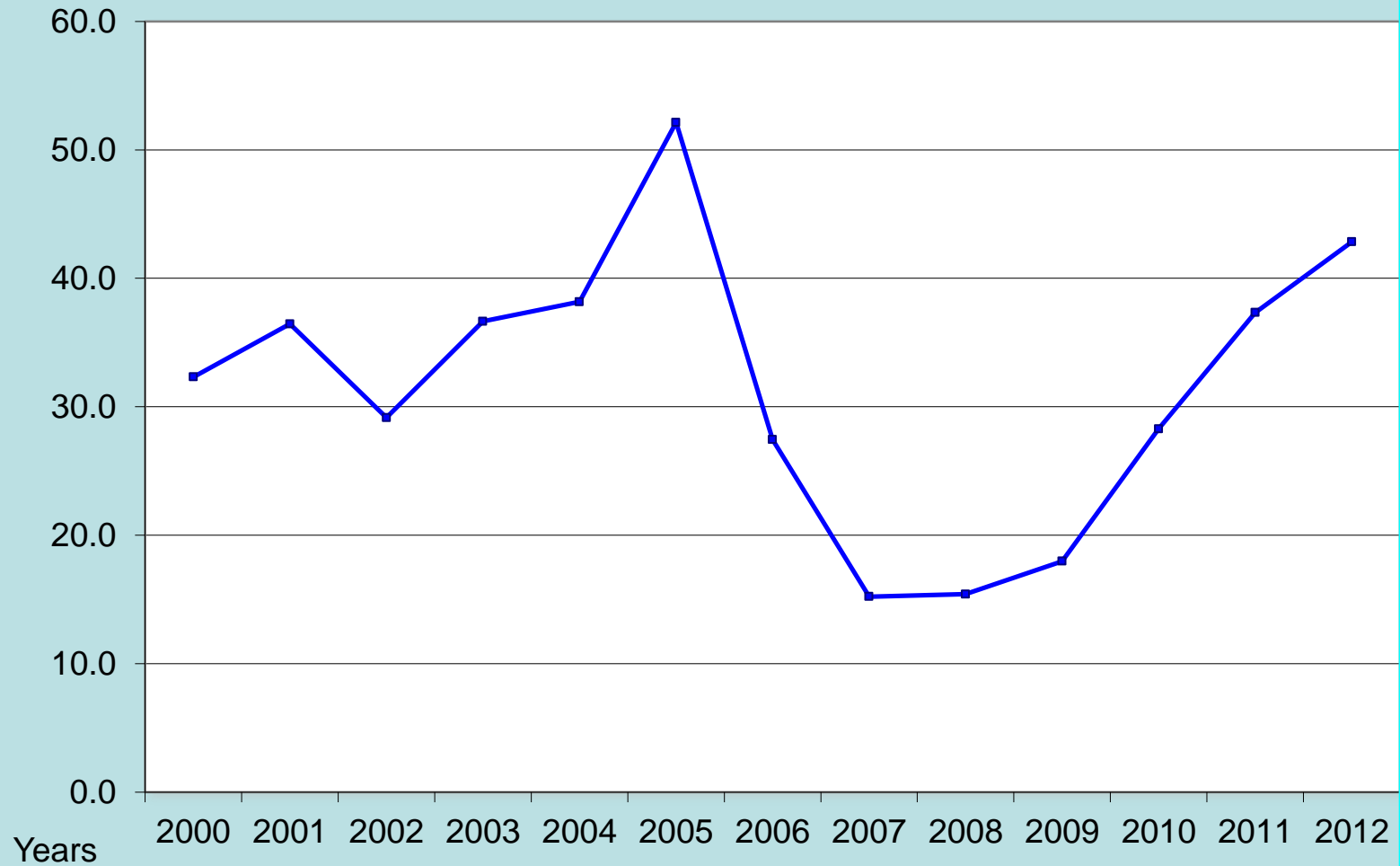
SOURCE: MINISTRY OF HEALTH (Value)

- Less than 2
- 2 - 3,910
- 3,911 and More

COUNTRY

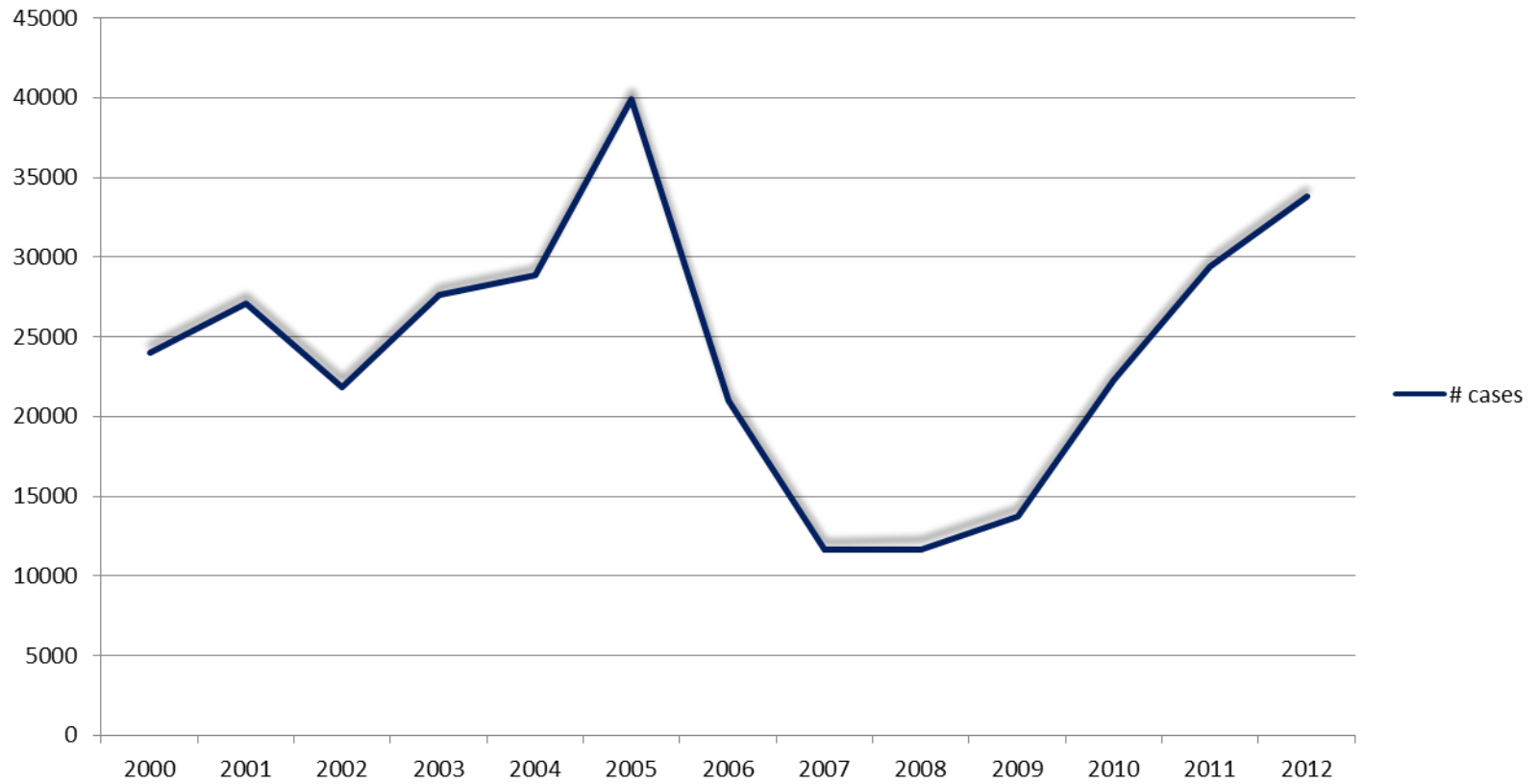


Annual parasite index (X 1000) - 2000- 2012, Guyana

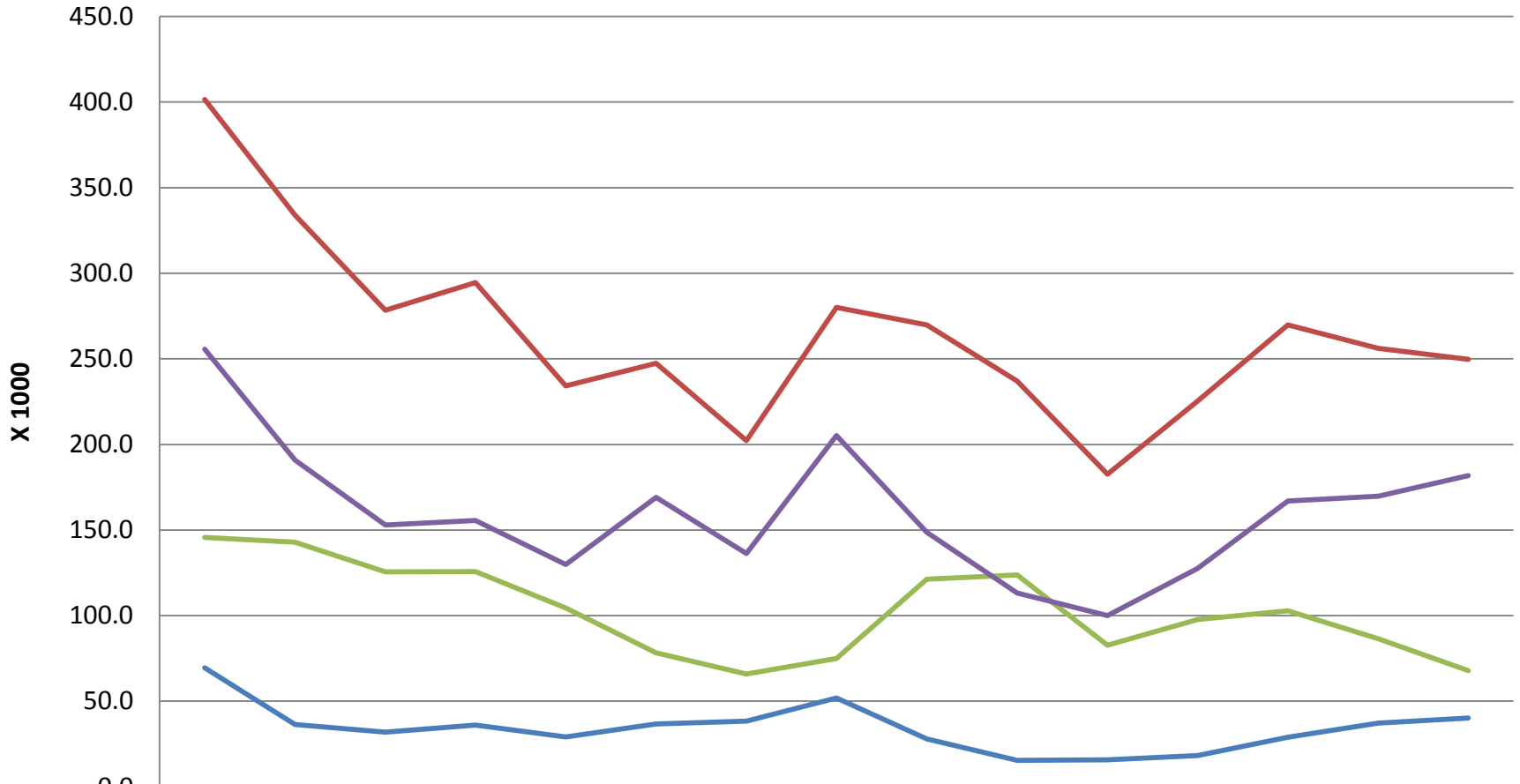




**Total malaria cases by year Guyana, 2000-2012**

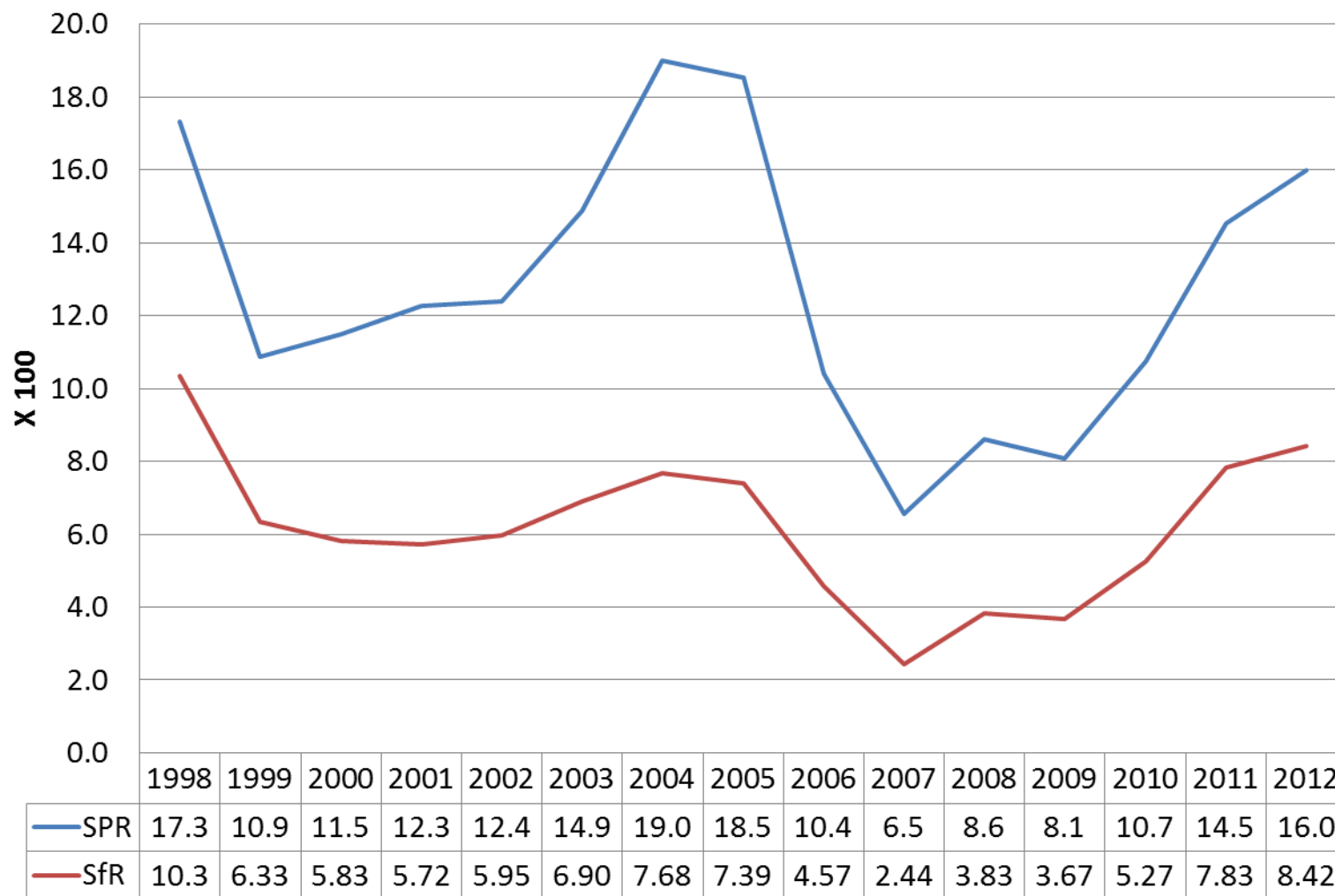


### Malariometrics Indicators, Guyana

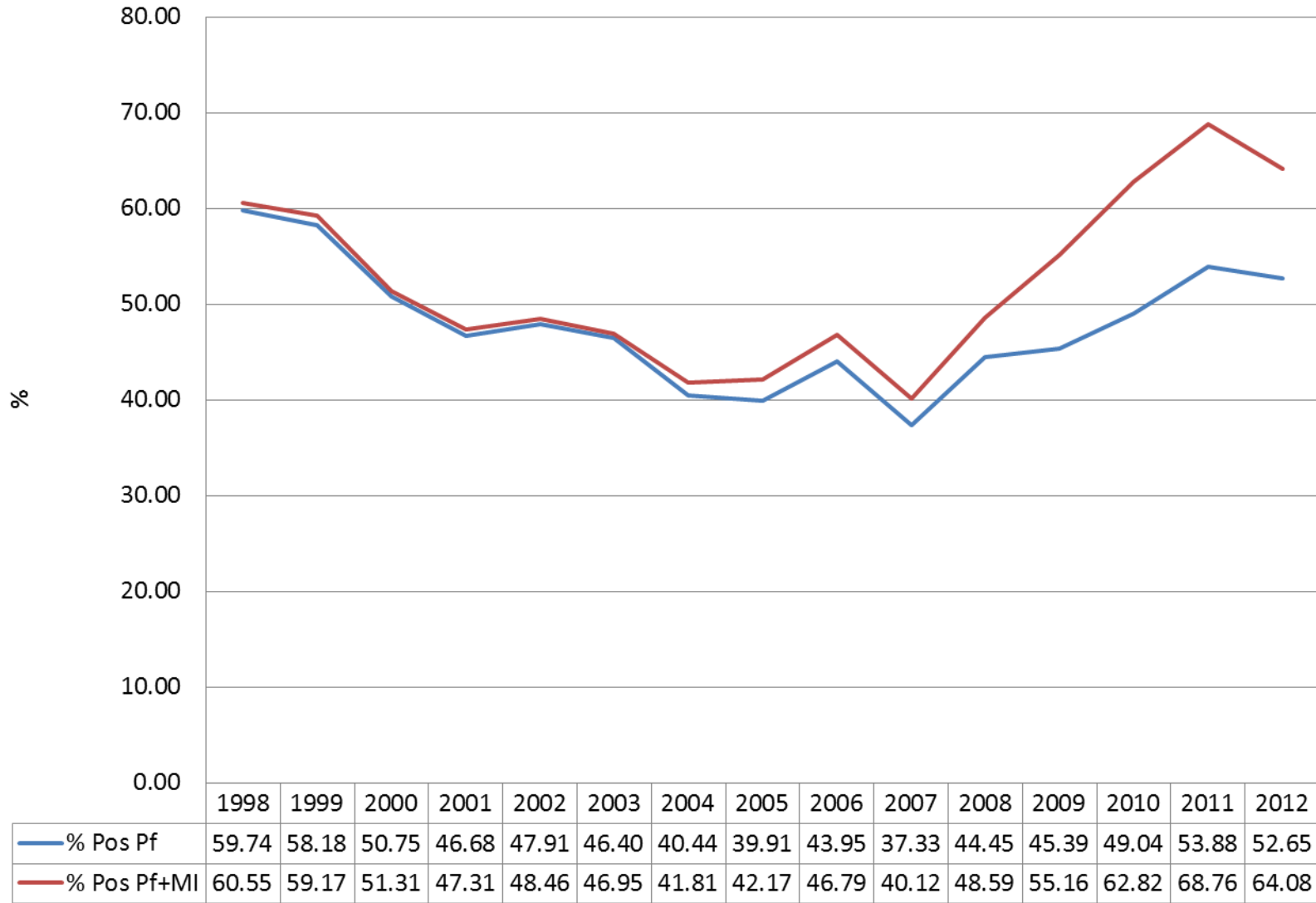


	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
APIs	69.5	36.3	32.0	36.1	29.1	36.8	38.4	51.9	28.0	15.5	15.7	18.2	29.0	37.2	40.1
ABER	401.5	333.9	278.5	294.5	234.2	247.4	202.3	280.1	269.8	237.0	182.7	225.4	269.8	256.1	249.7
Active	146	143	126	126	104	78	66	75	121	124	83	98	103	86	68
Passive	256	191	153	156	130	169	136	205	149	113	100	128	167	170	182

## Malariometrics Indicators, Guyana

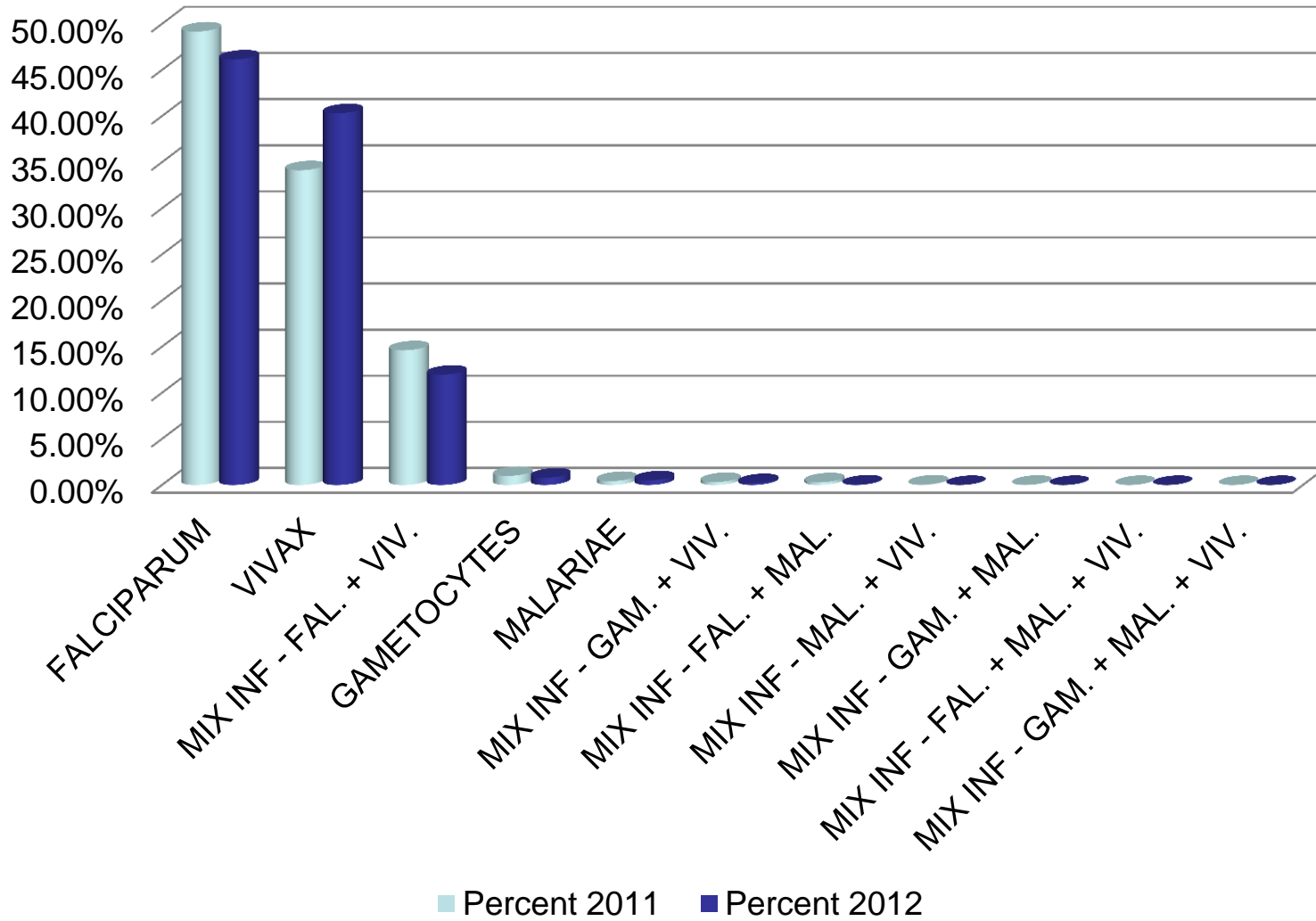


### Malariometrics indicators, Guyana



Year	Slide Positive Rate By regions & years			
	Regions -% -			
	1	7	8	9
2010	14.7	17.2	16.9	2.5
2011	19.4	23.8	22.3	2.4
2012	20.7	26.0	19.8	3.2

## Percentage of malaria parasite 2011-2012-Guyana



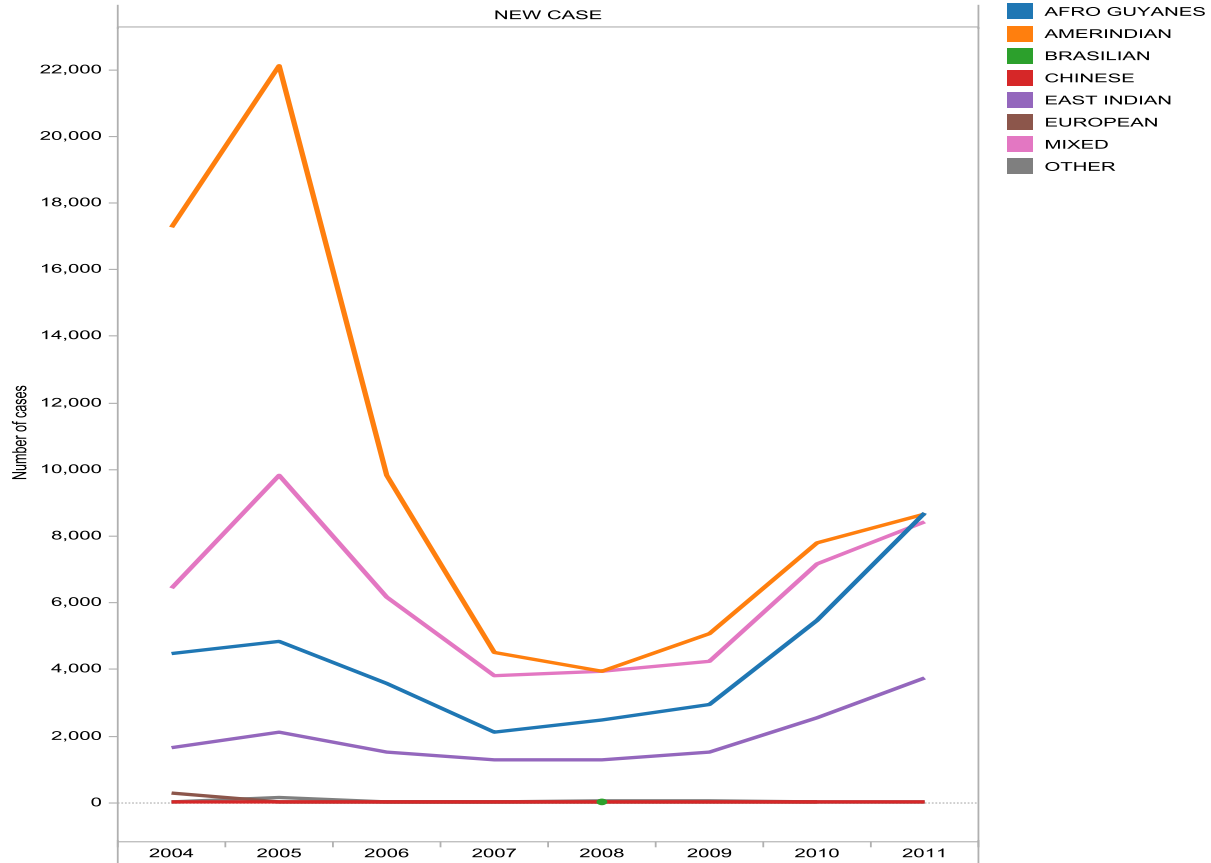
## Total cases in miners in endemics regions, Guyana

# Total Cases					Total cases in miners* (64 %)		
Region	Population 2010-2012	2010	2011	2012	2010	2011	2012
1	25448	6522	8143	8694	4174	5212	5564
7	18447	6746	6594	7886	4317	4220	5047
8	10583	5707	7685	6470	3652	4918	4141
9	20324	1217	1126	1104	779	721	707
<b>Total</b>	<b>74801</b>	<b>20192</b>	<b>23548</b>	<b>24154</b>	<b>12923</b>	<b>15071</b>	<b>15459</b>

\* 64 % of total of cases are miners as occupation( In vivo Study 2011-2012)

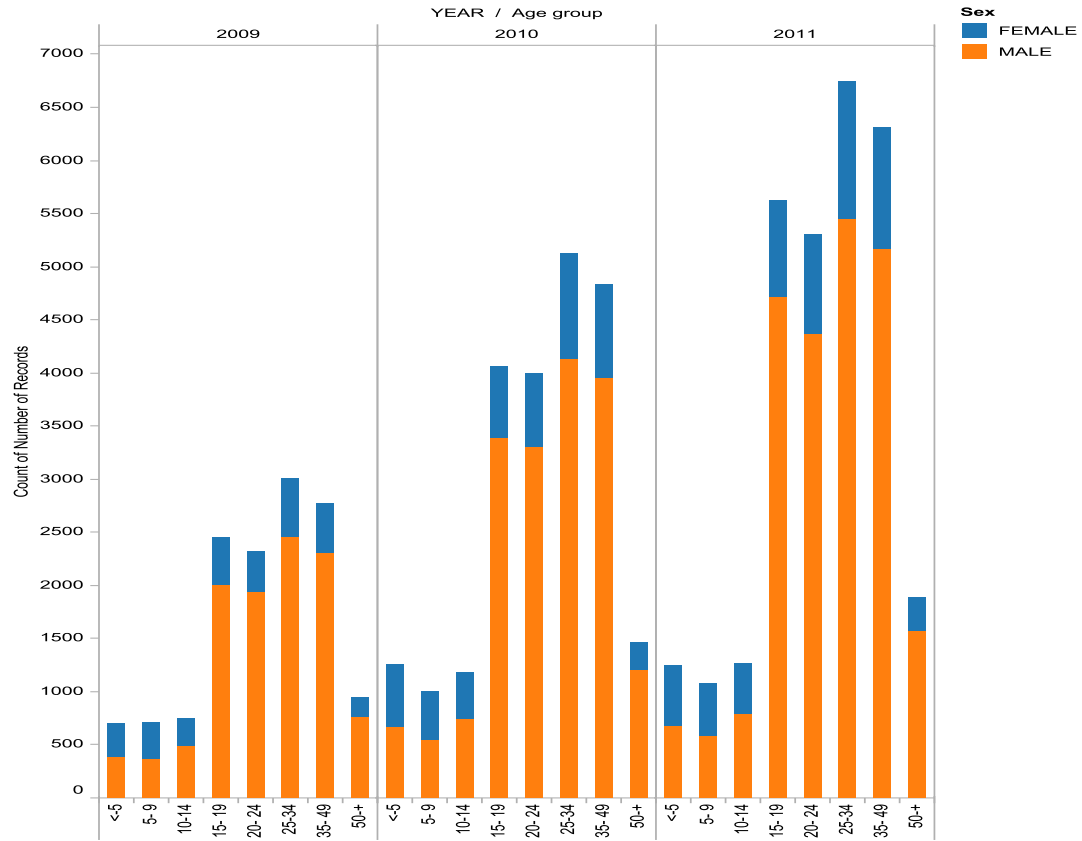
### Cases by Ethnic groups

Case / DateSmearTAKEN  
NEW CASE





### New cases of malaria by sex and age group Guyana



## Hot spot localities, Guyana by year

WhereInfected	YEAR				
	2008	2009	2010	2011	2012
Arakaka	509	735	1,299	1,903	2,568
Aranka River	311	514	1,274	1,149	1,204
Arimu Mine	676	859	1,082	1,028	1,074
Barama River	294	348	574	800	946
Baramita	65	295	716	938	362
Cuyuni River	298	488	714	525	691
Five Star Landing	17	79	493	797	328
Issano	414	623	582	1,005	1,256
Konawaruk	536	1,089	1,307	1,034	842
Mahdia	1,216	2,618	4,085	5,726	5,392
Matthews Ridge	129	442	1,050	1,516	1,177
Mazaruni River	272	418	388	437	507
MICOBIE VILLAGE	56	142	310	692	515
OKO RIVER	282	627	728	588	491
Omai	869	420	730	1,717	1,281
Port Kaituma	301	383	889	1,502	1,431
Puruni River	722	927	1,411	1,789	2,500
Quartzstone Landing	294	314	518	719	768
Tiger Falls	69	178	434	410	392
<b>Grand Total</b>	<b>7,330</b>	<b>11,499</b>	<b>18,584</b>	<b>24,275</b>	<b>23,725</b>

### Hot spot localities by region (Region 1)

Case	Locality	Region / YEAR			
		2008	2009	2010	2011
NEW CASE	Arakaka	226	363	688	933
	Mabaruma	267	559	861	823
	Pakera	145	233	706	367
	Port Kaituma	569	693	1,837	1,395
<b>Grand Total</b>		1,207	1,848	4,092	3,518

### Hot spot Localities by region ( Region 7)

Case	Locality	Region / YEAR			
		2008	2009	2010	2011
NEW CASE	Bartica Village District	1,523	649	546	1,168
	Enachu	3		3	
	Imbaimadai	4	14	12	2
	Issano	48	52	74	139
	Isseneru	10		2	103
	Jawalla	3	5	33	41
	Kaikan		23	7	3
	Kako River			22	5
	Kamarang		6	30	59
	Kubenang		2		
	Kurupung	35	45	22	
	Pipilipai		5	15	3
	Qwebanang			64	8
	Waramadong	2	2	2	3
<b>Grand Total</b>		1,628	803	832	1,534

### Hot spot localities by region (Region 8)

Case	Locality	Region / YEAR			
		2008	2009	2010	2011
		8			
NEW CASE	Chenapau	64	56	229	203
	Kopinang Amer. Vil.	16	36	42	25
	Kurukabaru	6	16	37	5
	Mahdia	556	681	1,278	2,419
	MICOBIE VILLAGE	55	53	172	636
	Paramakatoi Amer. Vil.	41	34	95	97
	Tumatumari	23	85	117	127
<b>Grand Total</b>		761	961	1,970	3,512

### Hot spot localities by region (Region 9)

Case	Locality	Region / YEAR			
		2008	2009	2010	2011
		9			
NEW CASE	Karasabai Amer. Dist.	28	33	16	28
	Karaudanawa Amer. Vil.	33	127	110	64
	Lethem	220	173	184	274
	Tipuru 9	142	18	28	11
	Yupukari Amer. Vil.	13	31	21	64
<b>Grand Total</b>		436	382	359	441

## **Activities done by line of work:**

- **Monitor the efficacy and quality of antimalarial medicines**  
**To monitor the drug efficacy study of Artemeter-Lumefantrine Combination therapy (ACT) was conducted in Georgetown, between May 2011 and July 2012 at the Malaria Clinic & Tropical Diseases Laboratory, Georgetown Public Hospital Compound (GPHC), Georgetown, in region 4, Guyana.**
- **Quality assurance of anti-malarial drugs (Surveillance of quality of drugs)**  
**Adopt the “Three levels approach strategy by the MOH,**
  - **Elaboration of MOU.**
  - **Training of pharmacists on Three level approach, done by FDD**

## **Activities done by line of work:**

### **Delivery drugs and supply:**

**Continue the implementation of Supervision tool to monitor the situation of Medicines, and the SOP of the supply chain management and start the distribution into the regions.**

### **Early diagnosis and prompt treatment**

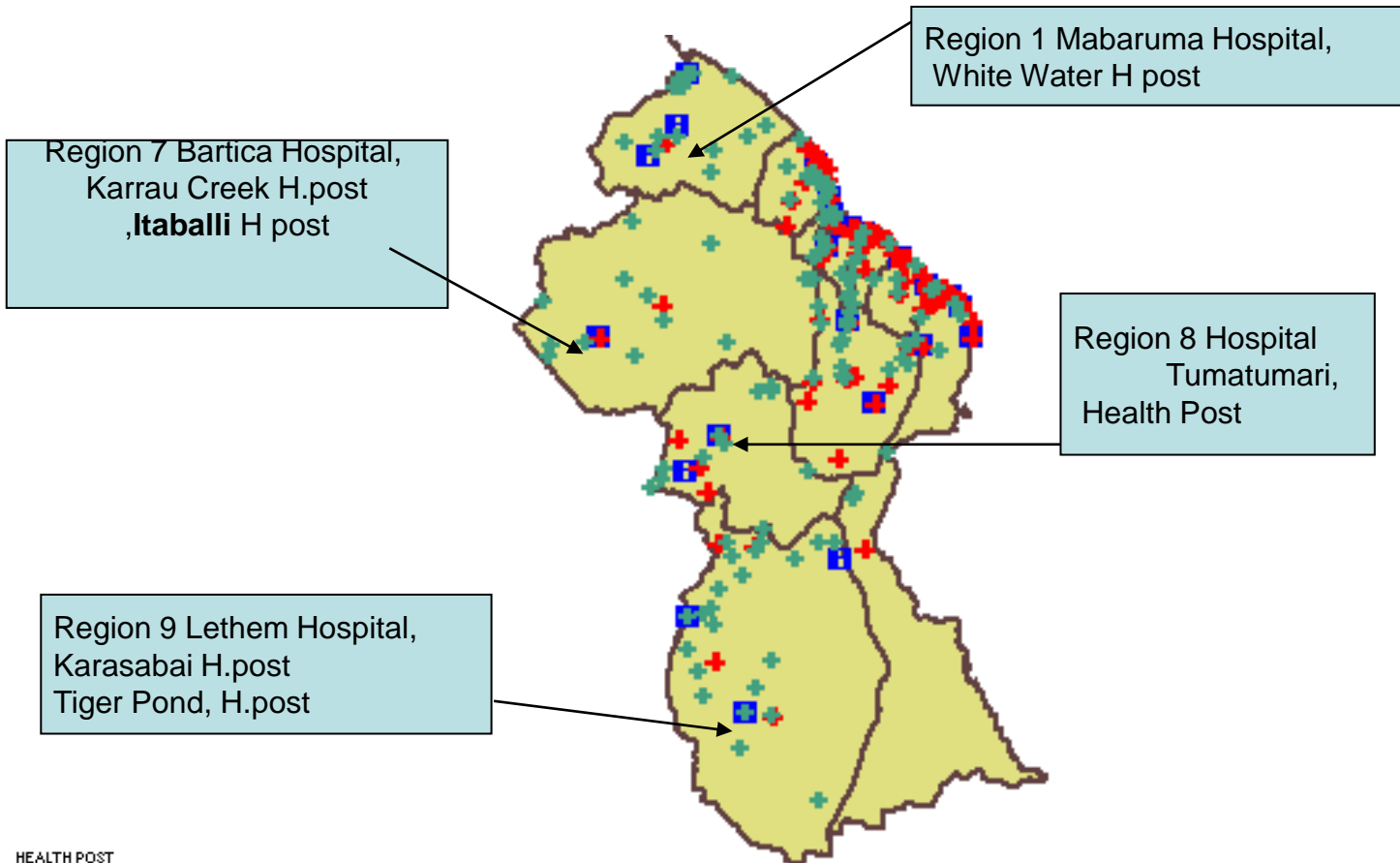
**Update the version of treatment guide line (TGL) of Malaria and last draft submitted to the MOH for revision.**

**Continue with the dissemination of Standard Operational Procedures on diagnosis (SOPs) and training manuals into the regions.**

**Microscopy training course was held in region 4,,: 27 persons were trained From all the regions.**

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# Regions and places visited in the course of implementation of supervision tool.



HEALTH POST



HEALTH CENTRE



HOSPITAL



ADMIN1









## **Activities done by line of work:**

### **Vector Control**

**Implementation of structure of vector control, entomology training 2011**

**Build the capacity of vector control activities, 49 persons from the MOH were trained on Integrated Vector Control Approach in Guyana, 3 persons by each region and 19 from Georgetown participated, to continue the improvement of vector control unit.**

**Vector control needs assessment completed and presented to the MOH**

**Evaluation of decentralization and integration of MP into the PHCs a report was submit to the MOH.**

**TCC between Suriname and Guyana submitted to PAHO/WHO MOH.**

**Participation in the elaboration of house Hold survey proposal submitted to the GF  
Delivery 50,000 ? bed nets, By MOH and 15000 by GF in endemic regions.**

## **Activities done by line of work:**

**Malaria Surveillance, using stratification method**

**Preparing Mining operational plan and MOU with Miners.**

**Malaria day launched November 6, in region 9**

**Preparedness to contain outbreak: results**

# Preparedness to contain outbreak: results





# Launching Malaria day Guyana



# Launching Malaria day Guyana





## TREATMENT

Seeking treatment is the sure way to break the cycle of transmission in mining / logging camps.

Treatment begins with a blood smear to identify the type of malaria.



Tablets are given according to the type of malaria:

- Vivax - 14 days
- Falciparum - 3 days
- Malariae - 3 days

If you stop using the tablets after a day or two because you feel better, you will become ill again with malaria and continue to spread the disease.



**ALL TABLETS prescribed must be taken, so all the malaria parasites can be killed for a complete cure.**



### BEWARE OF COUNTERFEIT DRUGS!

Genuine drugs are assured only through:

- ➔ In registered mining camps across Guyana by trained microscopists
- ➔ ALL community health facilities
- ➔ Regional Hospitals and Malaria Clinic, Georgetown

## PREVENTION

Here are steps for malaria prevention and control in mining / logging camps:

- ✓ Always use mosquito bed or hammock nets to prevent mosquitoes from biting. Nets that are treated with insecticide are the best.
- ✓ Mend holes in the mosquito nets right away.
- ✓ Put mosquito (fine) mesh or mosquito netting over windows and window spaces where possible.
- ✓ Burn mosquito coils.
- ✓ Wear protective clothing - long sleeved shirts, long pants and socks will help to prevent bites and use insect repellent especially at night and when outdoors.
- ✓ Kill adult mosquitoes by spraying with insecticides.
- ✓ Eliminate mosquito breeding sites around the mining camps by filling in areas that contain trapped, stagnant water.
- ✓ Clean up the camp grounds and surroundings to destroy other breeding sites for mosquitoes, for example: plastics, containers, old tyres, fallen trees etc.

*Note: You know that mosquitoes are breeding when you see mosquito larvae (mosquito worms) in ponds or containers (buckets/drums).*

## WHAT YOU SHOULD KNOW ABOUT MALARIA



### WHAT IS MALARIA?

MALARIA is a disease caused by the presence of very small parasites in the blood. It is spread by the 'anopheles' mosquito. However, malaria is both preventable and curable.

### IN GUYANA THERE ARE 3 TYPES OF MALARIA:

1. FALCIPARUM
2. VVAX
3. MALARIAE

AND MIXED INFECTIONS  
ANY COMBINATION OF THE THREE TYPES

MALARIA exists in mining / logging camps because the mosquitoes that transmit the disease are present in the forests, swamps and mining & logging camps where there are water logged areas, water-filled holes and excavations that have not been filled in.



# WHAT IS MALARIA?

MALARIA is a disease caused by the presence of very small parasites in the blood. It is spread by the female 'anopheles' mosquito.

## IN GUYANA THERE ARE 3 TYPES OF MALARIA:

1. FALCIPARUM

2. VIVAX

3. MALARIAE

AND MIXED INFECTIONS - ANY COMBINATION OF THE THREE TYPES

Mosquito bites a miner / logger infected with malaria and takes in the malaria parasite



The infected mosquito bites a healthy miner / logger and infects them with the malaria parasite



If a sick miner / logger does not seek treatment, drink all of his tablets or takes the wrong tablets, he will PASS THE DISEASE TO OTHERS and may even DIE



## SIGNS & SYMPTOMS

Ague  
Chills  
Headache  
Body pain  
Fever  
Sweating  
Loss of Appetite



A smart miner / logger seeks reliable treatment from a trained "medic" or nearest health facility

The healthy miner / logger becomes ill with malaria

## MALARIA CAN BE PREVENTED & CURED

