Malaria surveillance efforts in Cambodia

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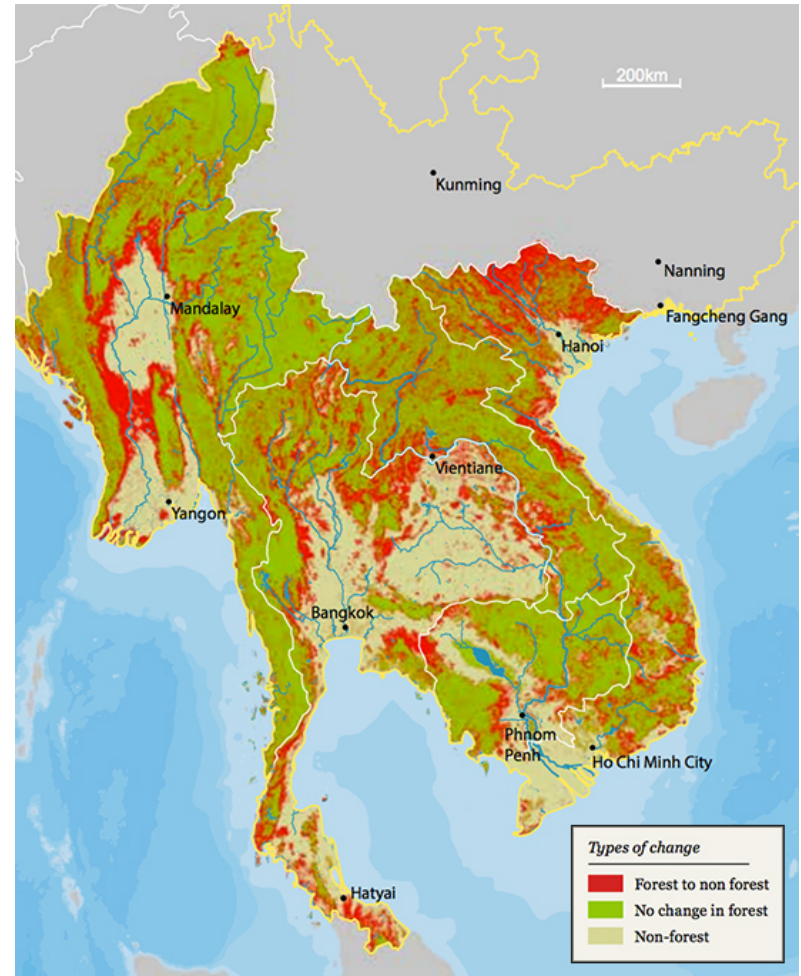
Challenges in the Mekong Region

- **Drug resistant *P. falciparum* malaria**

Source: WHO

Challenges in the Mekong Region

- Drug resistant *P. falciparum* malaria

- **Forest related malaria and potent exophagic vectors**

Types of change

- Forest to non forest
- No change in forest
- Non-forest

Source: WHO

Challenges in the Mekong Region

- Drug resistant *P. falciparum* malaria

- Forest related malaria and potent exophagic vectors

- **Cross border movement, migration of labour force**

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Challenges in the Mekong Region
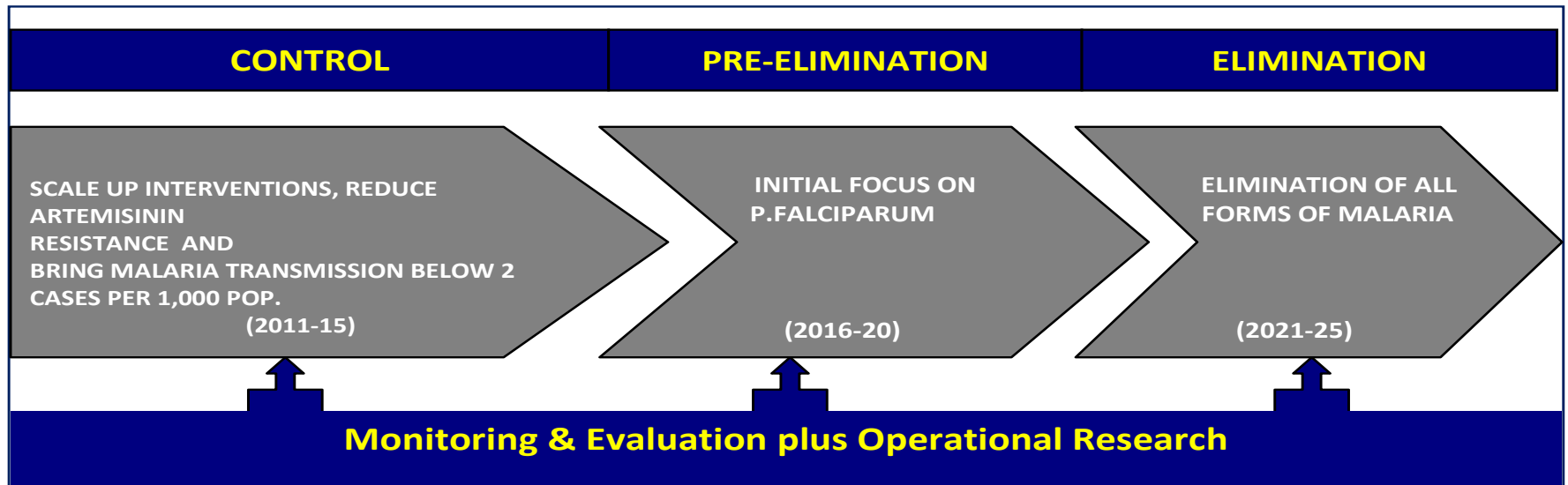
- Drug resistant *P. falciparum* malaria

- Fo **Mobile and Migrant Populations (MMPs)** po

- Cross border movement, migration of labor force

Source: WHO

# The Cambodian National Strategic Plan for Elimination of Malaria

CONTROL	PRE-ELIMINATION	ELIMINATION
SCALE UP INTERVENTIONS, REDUCE ARTEMISININ RESISTANCE AND BRING MALARIA TRANSMISSION BELOW 2 CASES PER 1,000 POP. (2011-15)	INITIAL FOCUS ON P.FALCIPARUM (2016-20)	ELIMINATION OF ALL FORMS OF MALARIA (2021-25)

Monitoring & Evaluation plus Operational Research

Short-term (by 2015): To move towards pre-elimination of malaria across Cambodia, bringing level of transmission below 2 cases per 1,000 population for most parts, with special efforts to contain artemisinin resistant *Plasmodium falciparum* malaria.

Medium-term (by 2020): To move towards elimination of malaria across Cambodia with an initial focus on *P.falciparum* malaria and ensure zero deaths from malaria.

Long-term (by 2025): To achieve phased elimination of all forms of malaria in Cambodia.

Malaria trends in Cambodia

# of Malaria Treated Cases, Severe Cases and Deaths, 2000 to 2012 in Cambodia
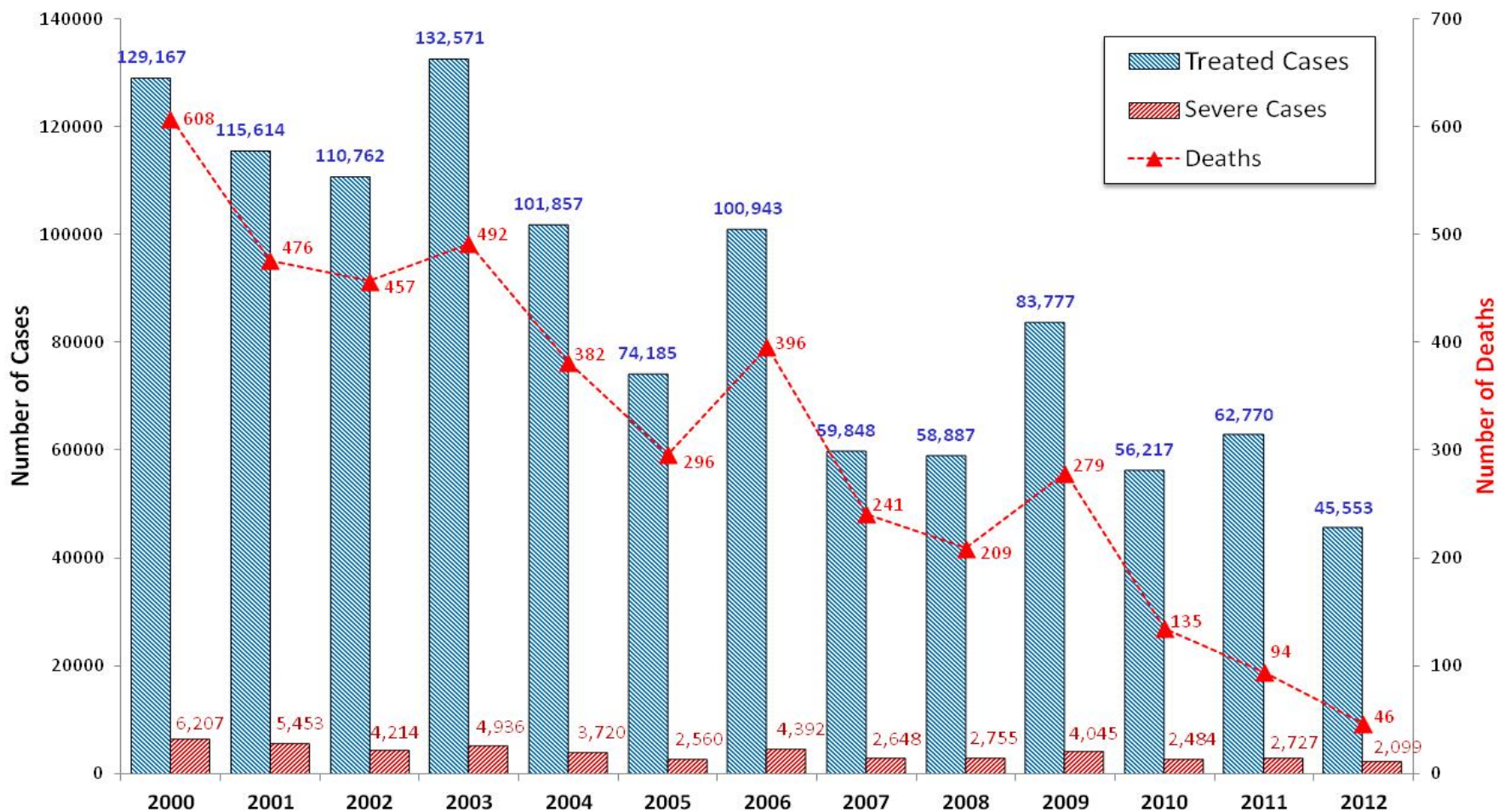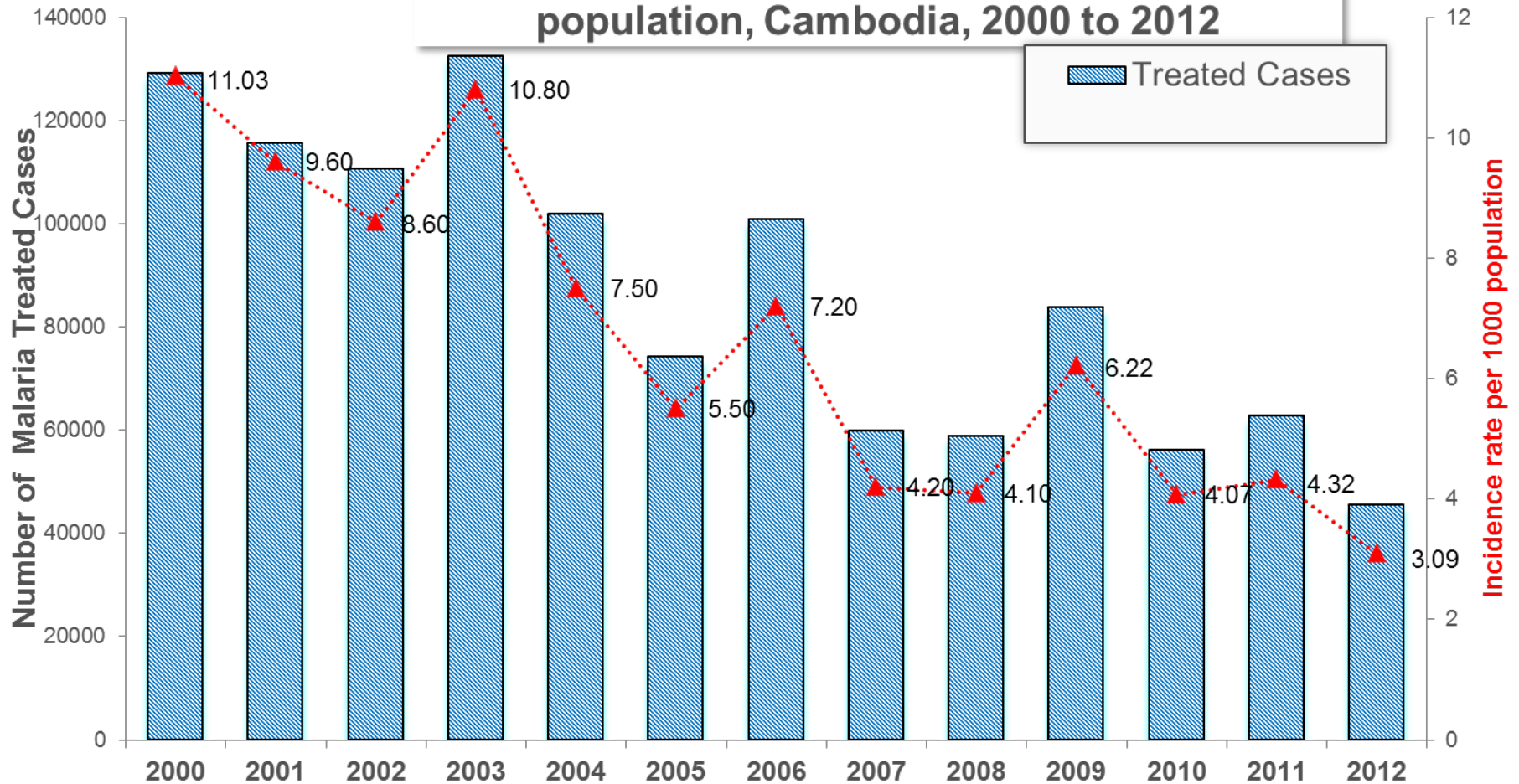
Source: Epidemiology Unit, CNM

Malaria trends in Cambodia

Incidence rate of malaria treated cases per 1000 population, Cambodia, 2000 to 2012

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Malaria surveillance system prior to 2009

Health Information System (HIS):

▶ Malaria data available down to health facility level

▶ Lab data not directly linked to the patient

Limited Day 3 information from sentinel site surveillance

Risk stratification based upon distance from the forest using outdated maps (heavy deforestation in areas of the containment zone)

What information was required?

1. Demographic and malaria case data for…

Monthly **village level data** to be used for statistics, planning and village level stratification, including:

- ► No. of malaria cases by species (*Pf, Pv*), age and sex of the patient
- ► No. of severe malaria cases
- ► No. of malaria deaths
- ► Treatments given

Planning interventions such as mosquito net distribution

Improvements made since 2009?

Increased the number of villages with of **VMWs and MMWs to over 1600**

Number of Village Malaria Workers (VMWs) villages by year

| 36 Villages | 264 Villages | 100 Villages | 723 Villages | 276 Villages | 129 Villages |

300 villages

Pilot (EC) — Global Fund R2 — Global Fund R6 — Containment WHO — Global Fund RCC — Global Fund R9

2001   2004   2008   2009   2010   2011
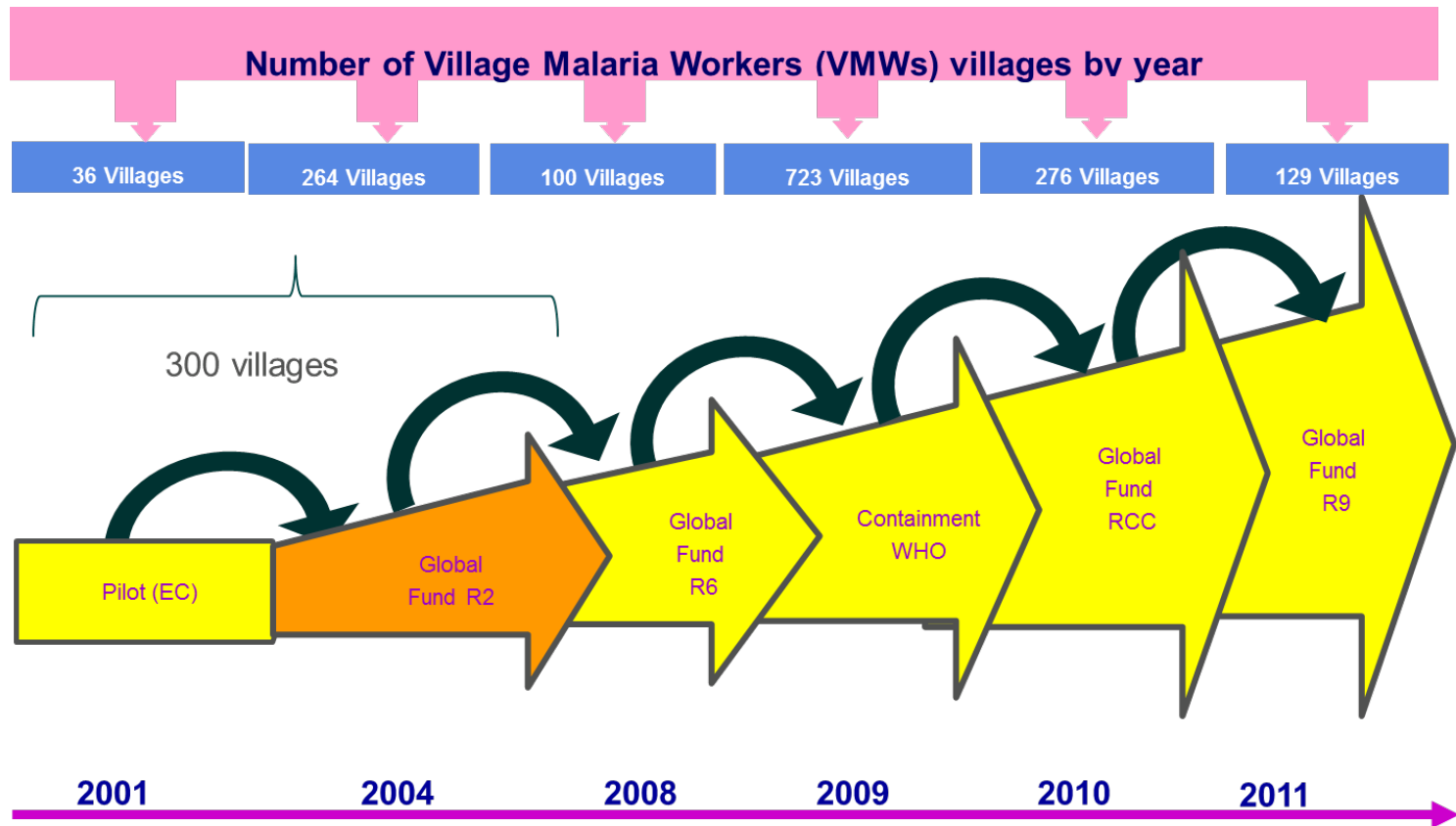
Improvements made since 2009?

Developed a database to process malaria data from VMWs, health facilities and data relating to mosquito net distribution and management (**MIS Database**)

> ➢ Installed in all 45 targeted Operational Districts

> ➢ Individual case data for all patients seen by VMWs and at public health facilities
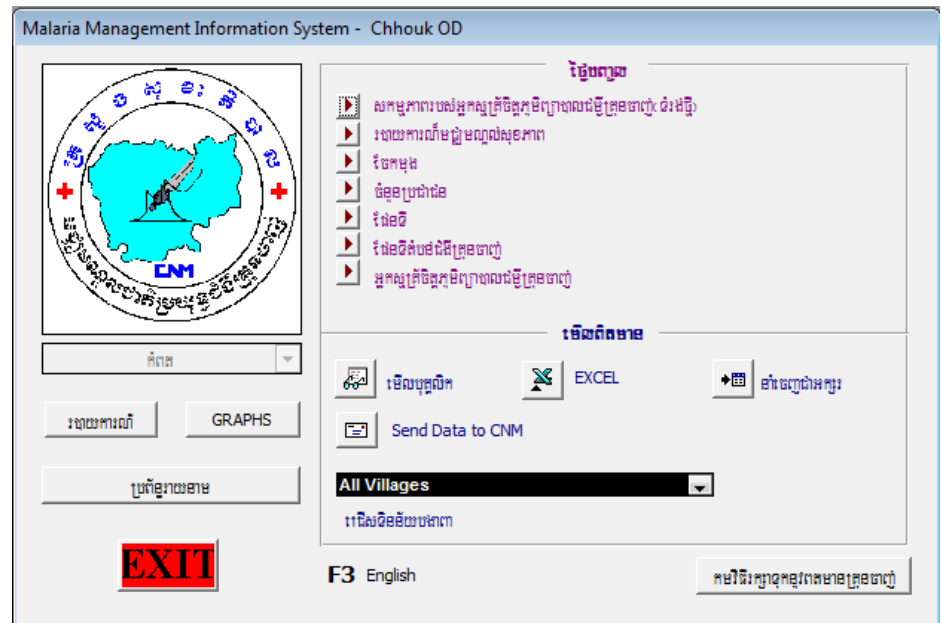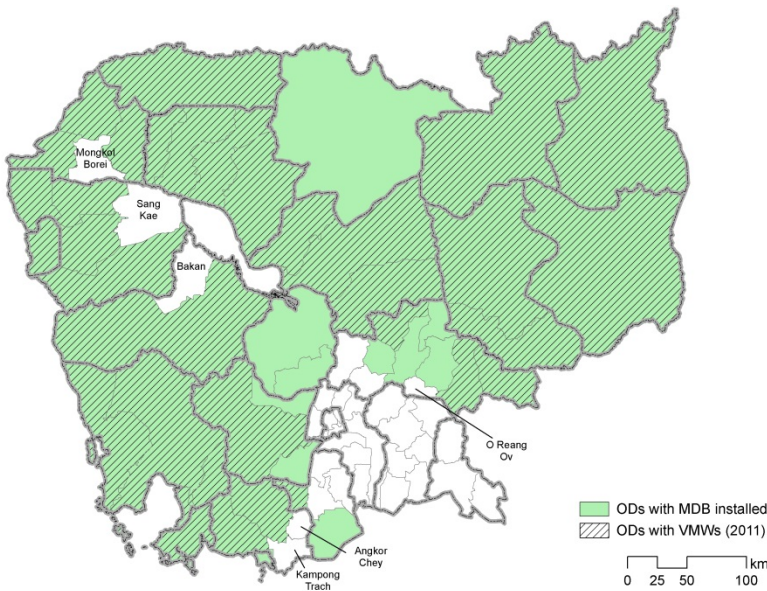
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Integration of facility level malaria data from the new **online HIS with the VMW and bed net data from malaria MIS database**
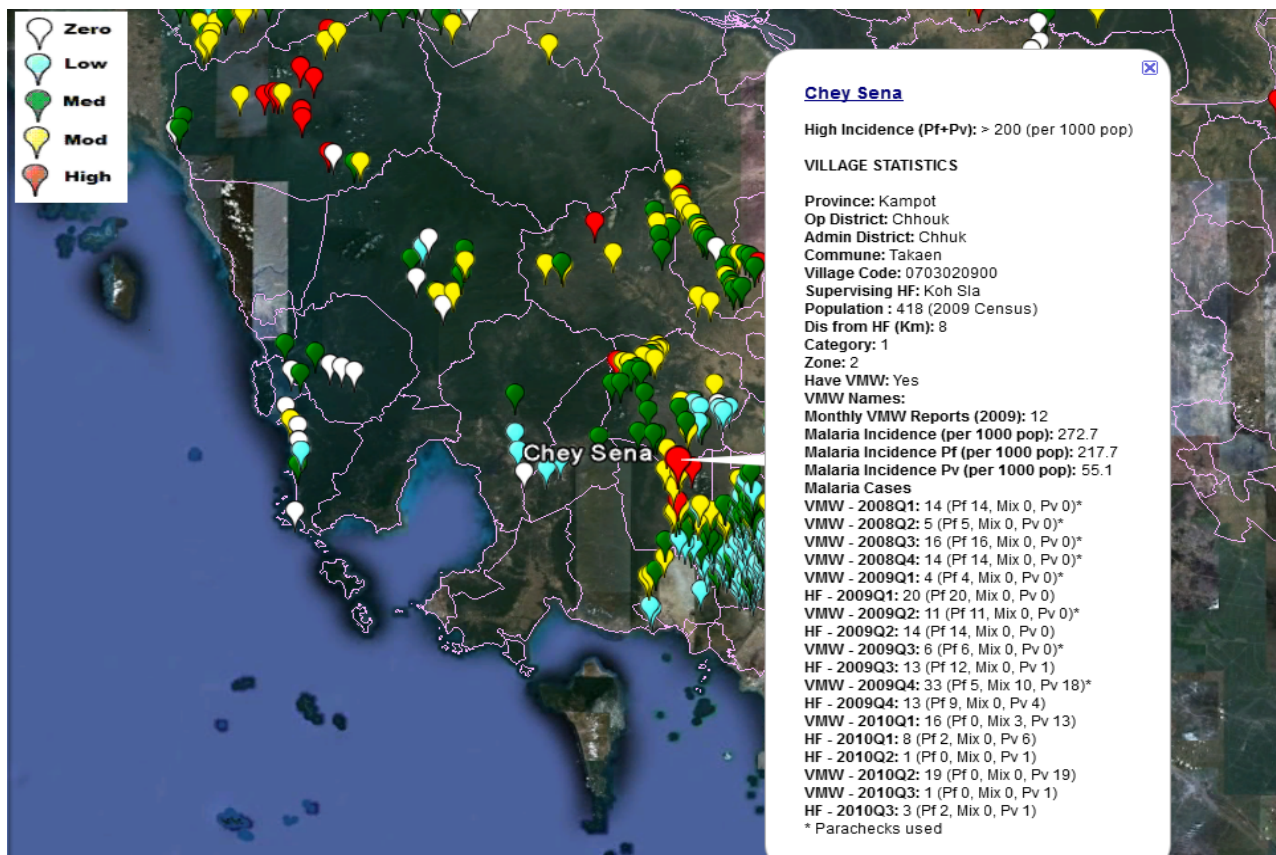
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- **Creation of a "Malaria Bulletin"**

Cambodia Malaria Bulletin (available at www.cnm.gov.kh)

Estimated coverage with LLIN or retreated mosquito net	Target [1]	Mobile [2]
No. of persons at risk of malaria	3,348,421	448,273
No. of LLIN distributed YTD	2,072	3,682
No. of LLIHN distributed YTD	1,607	467
No. of conventional nets distributed and retreated YTD	30,903	300
No. of long lasting nets distributed in last 3 years	2,959,334	4,149
Estimated coverage with LLIN / treated net (1 net / 1 pers)	89%	1%

[1] Pop of target villages   [2] Mobile pop (est from census)

National Surveillance data for the period Jan - Sep

Indicators	HIS			VMW			Total		
	2012	2013	Change	2012	2013	Change	2012	2013	Change
Malaria cases	35,386	18,023	-49%	22,599	13,270	-41%	57,985	31,293	-46%
Malaria Incidence	2.41	1.20	-50%	19.20	10.88	-43%	3.94	2.08	-47%
Malaria deaths	35	7	-80%	0	0	0%	35	7	-80%
Mortality rate [4]	0.24	0.05	-80%	0.00	0.00	0%	0.24	0.05	-80%

[3] Cases per 1000 pop   [4] Deaths per 100,000 pop   [4 5] VMW rates uses VMW village populations

Treated malaria cases from HIS and VMW by month

	10/10	11/10	12/10	01/11	02/11	03/11	04/11	05/11	06/11	07/11	08/11	09/11	10/11	11/11	12/11	01/12	02/12	03/12	04/12	05/12	06/12	07/12	08/12	09/12	10/12	11/12	12/12	01/13	02/13	03/13	04/13	05/13	06/13	07/13	08/13	09/13
HIS	6737	6209	7423	5841	4005	3104	2827	3672	6123	6659	6434	6071	5815	5893	6236	5521	4359	3826	3337	3057	3779	3999	3608	3900	3547	3293	3327	3026	1834	1610	1375	1449	2122	2233	2056	2319
VMW	5192	4871	5447	5195	3243	2315	2315	2811	3985	5255	5480	4973	4650	3573	3307	2843	2608	2400	2396	2376	2414	2752	2549	2265	2080	1891	2125	1567	1689	1378	758	1200	1641	1645	1836	1565
All	1192	1108	1287	1103	7248	5419	5142	6483	1010	1191	1191	1104	1046	9466	9543	8364	6967	6226	5733	5433	6193	6751	6157	6165	5627	5184	5452	4593	3523	2988	2133	2649	3763	3878	3892	3884

Severe malaria cases and deaths from HIS by month

- - ◆ - - Severe   - - ■ - - Deaths

Province level surveillance trends –
District Malaria Bulletin - Beyond Garki
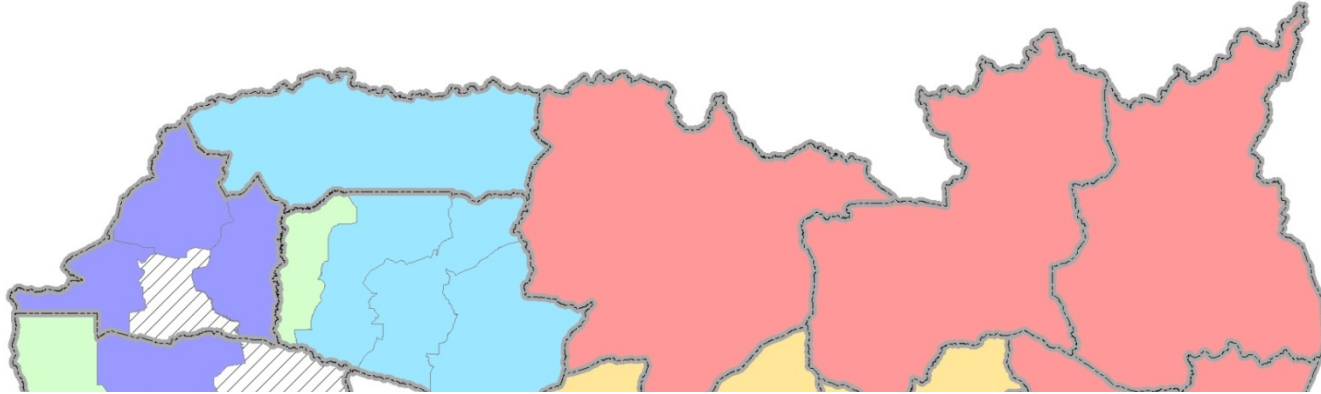
Median malaria incidence (all species) by OD

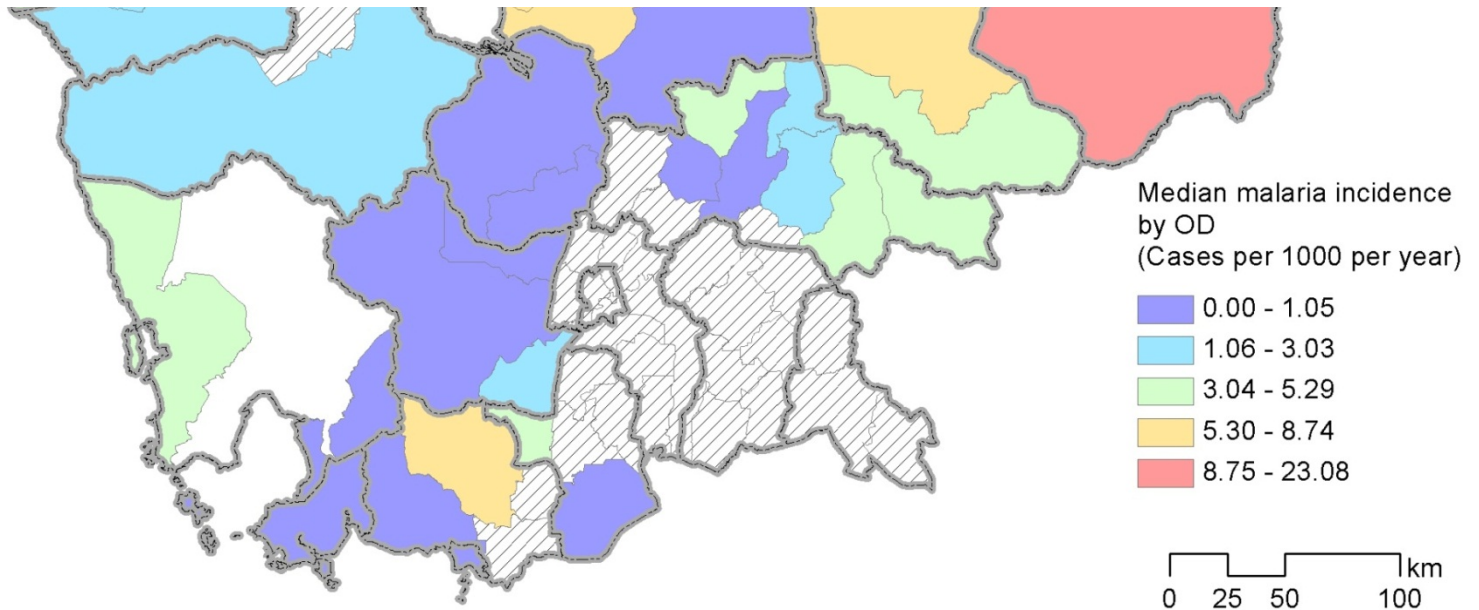Are the MDB and VMW system focusing on the right places?

Distance to forest based from 2004 and updated based on local knowledge

Median malaria incidence (all species) by OD

Are the MDB and VMW system focusing on the right places?

Median malaria incidence
by OD
(Cases per 1000 per year)

- 0.00 - 1.05
- 1.06 - 3.03
- 3.04 - 5.29
- 5.30 - 8.74
- 8.75 - 23.08

0 25 50   100 km

Using data for planning… Work in progress

Re stratification of all at risk villages in Cambodia based on village level incidence. Currently updating village stratifications based on 2011 incidence data

What information was required?

2. Real time data to facilitate rapid response

| Alert	Response
Real time data about individual patients still positive after 3 days (an indication of drug tolerance)	→	Patients to be interviewed to identify possible sites (hotspots) of transmission
Rapid identification of all Pf cases in drug resistant areas	→	Ensure appropriate testing, DOTS treatment (Malarone) and follow up
Real time data from health facilities about stock levels of malaria drugs	→	To prevent stock outs and supply drugs on a timely manner

Use of mHealth technology to report malaria cases
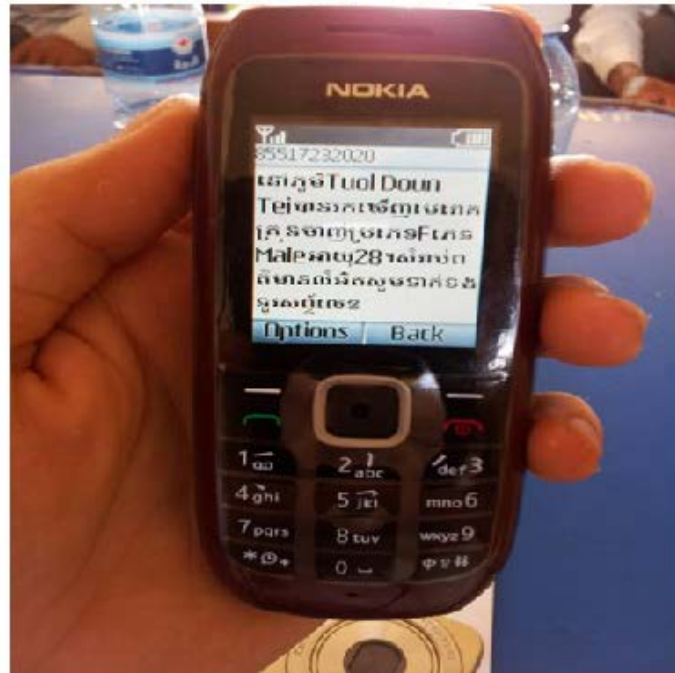
Is this enough?
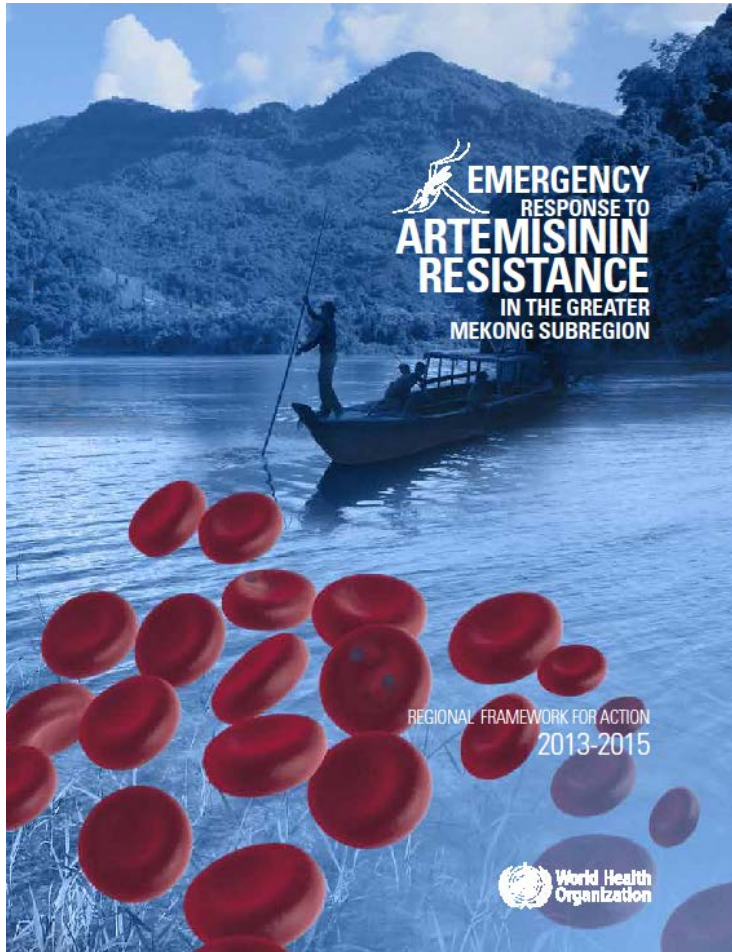
FULL COVERAGE OF QUALITY INTERVENTIONS IN PRIORITY AREAS

Action 1. Increase quality and coverage of key interventions in the private and public sector

Action 2. Engage health and non-health sectors to reach high risk populations

Action 3. Implement measures to ensure continuous and uninterrupted supply of essential commodities

TIGHTER COORDINATION AND MANAGEMENT OF FIELD OPERATIONS

Action 4. Strengthen coordination of field activities

Action 5. Monitor staff performance and increase supportive supervision

Action 6. Promote the integration of containment, elimination and malaria control while maintaining the focus on resistance

BETTER INFORMATION FOR ARTEMISININ RESISTANCE CONTAINMENT

Action 7. Improve collection and use of data to target operations

Action 8. Fast-track priority research and refine tools for containment and elimination

Action 9. Increase monitoring of antimalarial therapeutic efficacy and strengthen the therapeutic efficacy networks worldwide

Action 10. Increase monitoring of insecticide resistance

REGIONAL OVERSIGHT AND SUPPORT

Action 11. Enhance accountability and exchange of information

Action 12. Build political support at all levels

Action 13. Facilitate progress and regional cooperation on pharmaceutical regulation, production, export and marketing

Action 14. Create regional community of practice on approaches to high-risk populations

Action 15. Support cross-border coordination

Is this enough?

The Artemisinin resistance initiative

6 Priority interventions:

➜ Insecticide treated nets

➜ Indoor residual spraying

➜ Early diagnosis and treatment

➜ Private sector interventions

➜ Surveillance

➜ Behaviour change communication

Focus on evaluating responses to hotspots/outbreaks/ eventually single *Pf* cases
Focus on reaching/monitoring **populations at risk and hard-to-reach populations** (e.g MMPs).

Current gaps…

…relevant to malaria elimination

► Integration of routine M&E data focusing on hard-to-reach populations into MIS
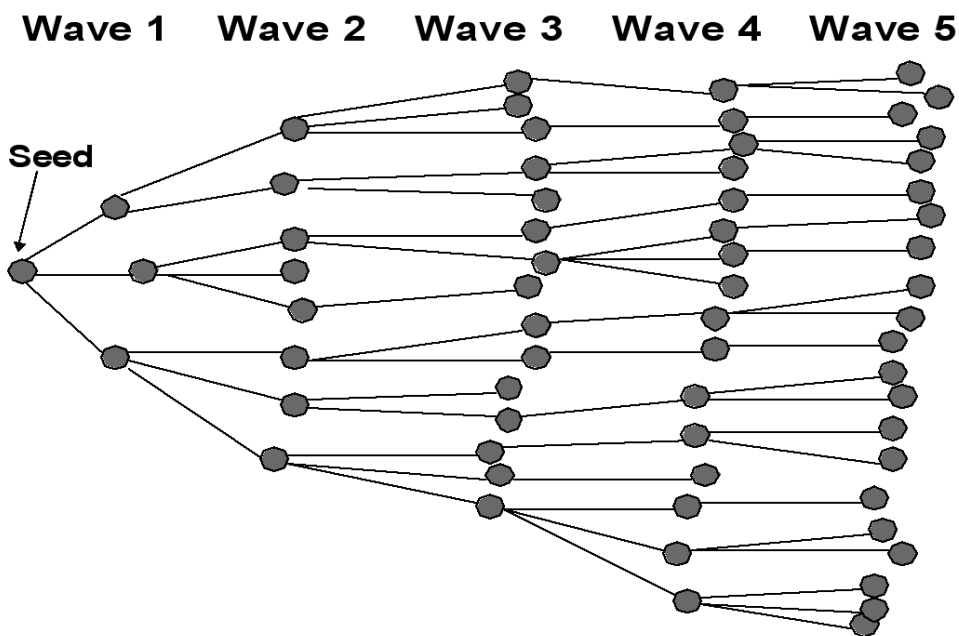
Respondent driven sampling on MMPs

Verboice technology

Current gaps…

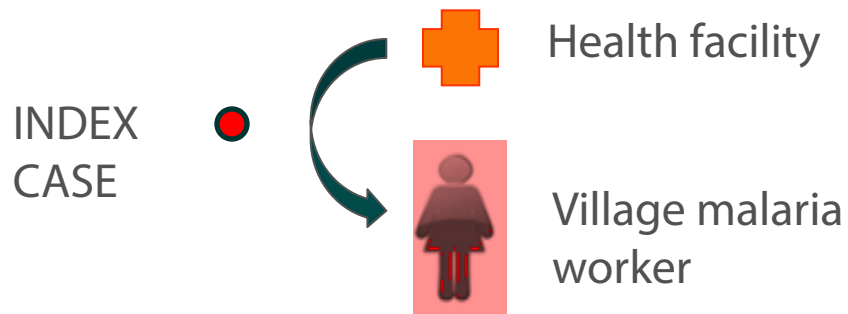…relevant to malaria elimination

► Integration of routine M&E data focusing on hard-to-reach populations into MIS (e.g. RDS)

► Re-active/pro-active case detection including standardised methodologies

► Exploration of novel deployment strategies (e.g. FSAT) and endorsement of alternative indicators to transmission intensity (e.g. serology)

► Exploration of the role of subpatent parasitaemias (clustering?)
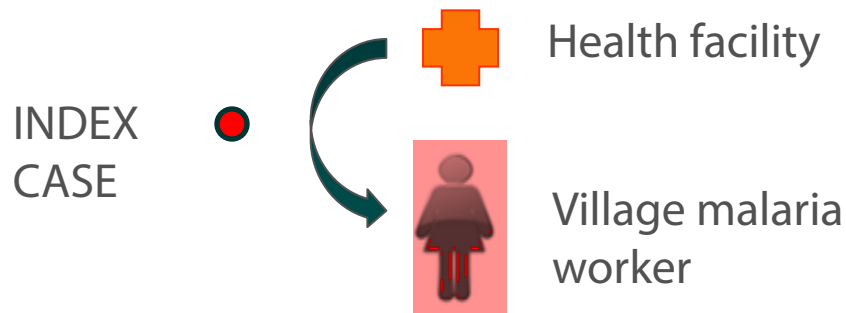
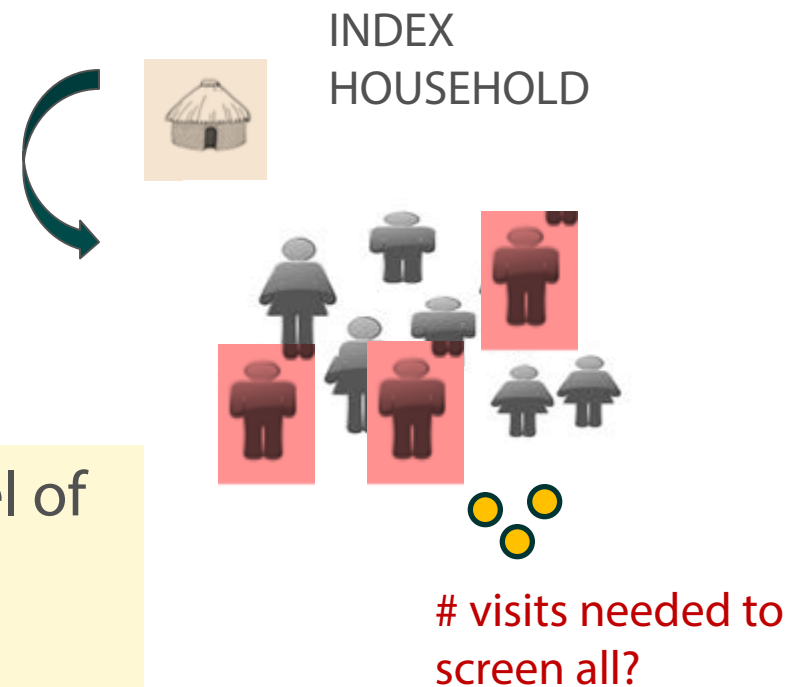# Way forward: reactive case detection- Pailin

Passive case detection

INDEX CASE ●

Health facility

Village malaria worker

Way forward: reactive case detection- Pailin

Passive case detection

INDEX CASE ●

Health facility

Village malaria worker

Better understanding on the level of clustering of asymptomatic parasitaemia at household level

Active case detection

INDEX HOUSEHOLD

visits needed to screen all?

Current gaps…

…relevant to malaria elimination

► Integration of routine M&E data focusing on hard-to-reach populations into MIS (e.g. RDS)

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► Exploration of novel deployment strategies (e.g. FSAT) and endorsement of alternative indicators to transmission intensity (e.g. serology)

► Exploration of the role of subpatent parasitaemias (clustering?)

► Need indicators to evaluate the impact of primaquine regimens. (ACT plus primaquine ==> radical cure, reduced transmission and decrease ArtRes spread)

► Regional surveillance system/early warning system

www.malariaconsortium.org

Thank you

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