# Examination of Malaria prevalence and prevention strategies under NVBDCP:

## A Case Study of Community Health Centre Govindgarh, Rajasthan

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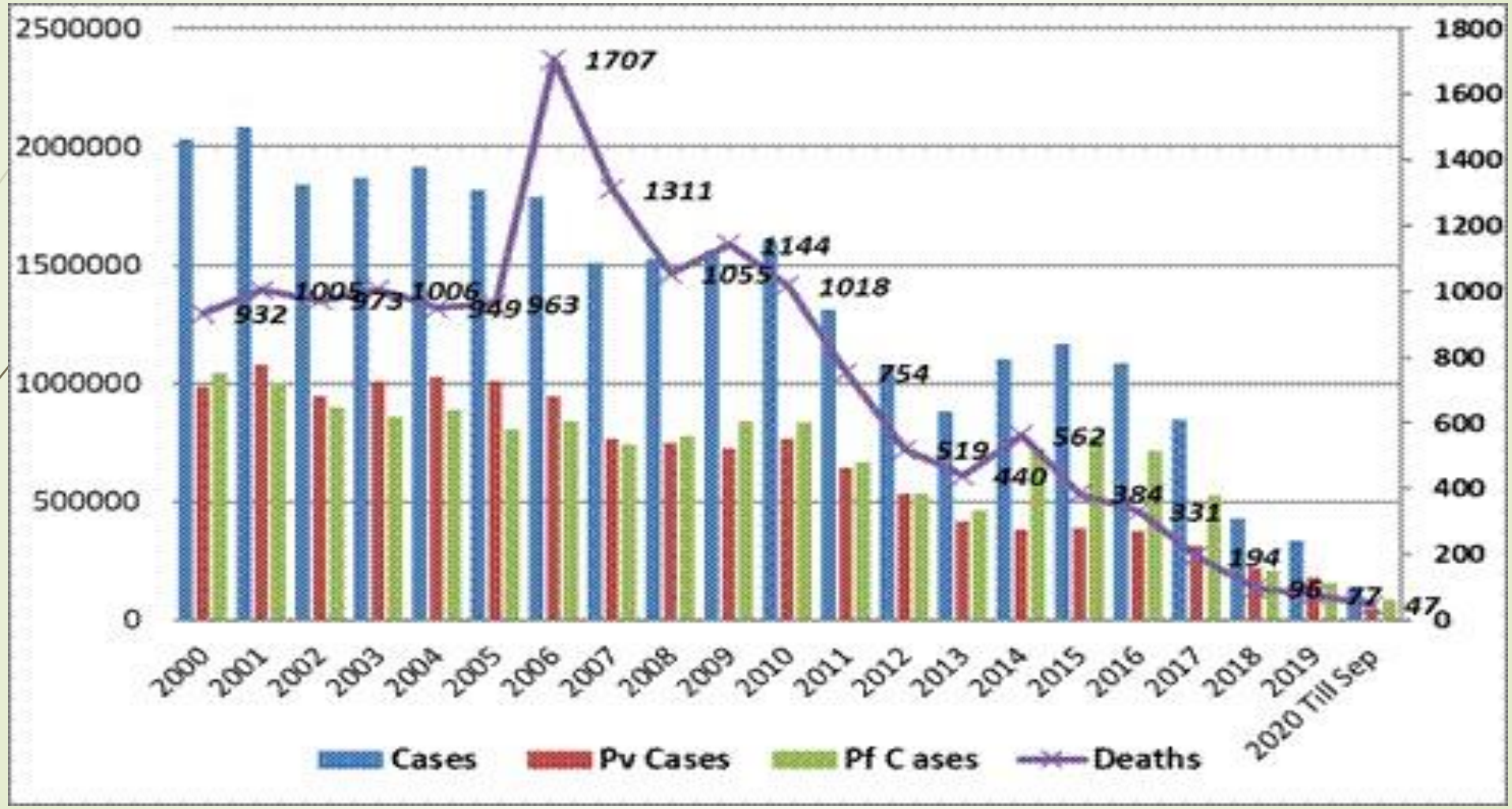
# Malaria prevalence in India



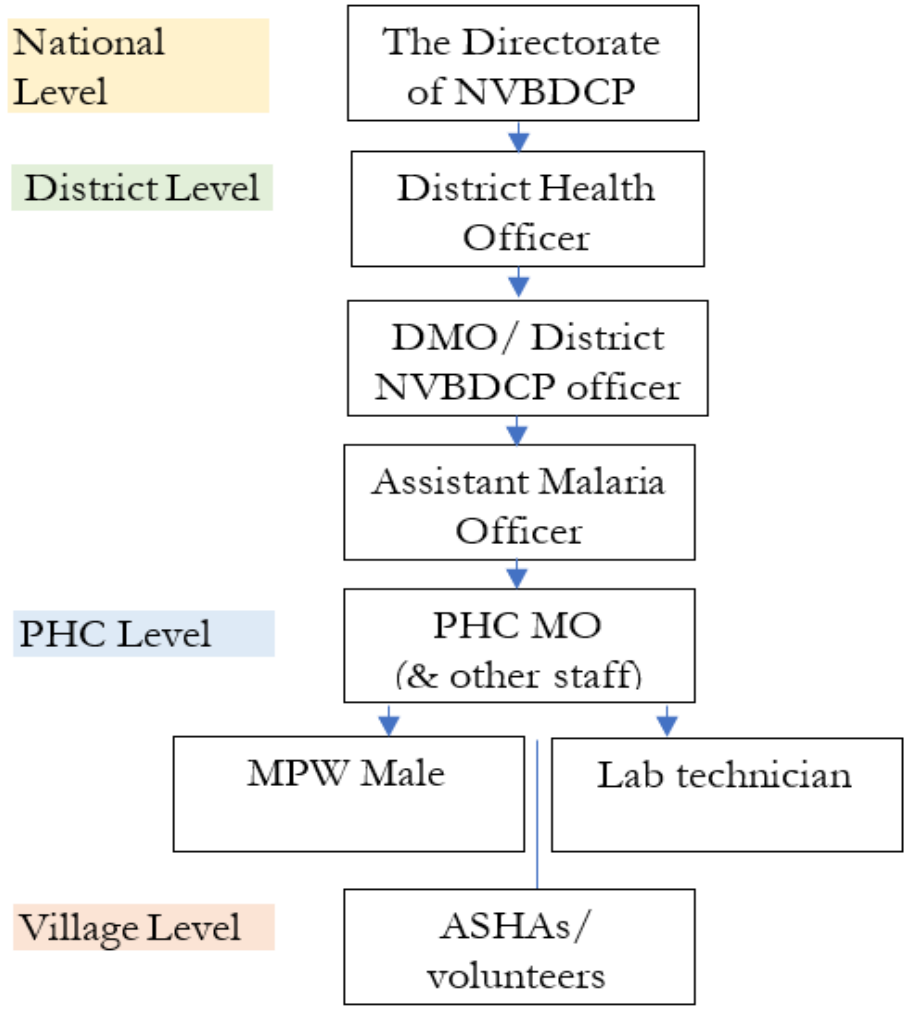

Source: World Malaria Report 2020

# Malaria cases in Rajasthan (2020-2022)

| Year | State/ Country | Blood Slide Examination | Positive Cases % | PF Cases | PF% | Slide Positivity Rate % | Slide Falciparum Rate | Deaths |
|---|---|---|---|---|---|---|---|---|
| 2020 | Rajasthan | 4778346 | 0.02 | 106 | 10.1 | 0.02 | 0 | 0 |
| **2020** | **India** | **90951598** | 0.20 | **115142** | **63.32** | **0.2** | **0.13** | **63** |
| 2021 | Rajasthan | 6632314 | 0.01 | 119 | 12.86 | 0.01 | 0 | 0 |
| **2021** | **India** | **114391977** | 0.14 | **101566** | **62.79** | **0.14** | **0.09** | **90** |
| 2022 | Rajasthan | 10250383 | 0.01 | 104 | 10.14 | 0.01 | 0 | 0 |
| **2022** | **India** | **139672021** | 0.12 | **99849** | **57.39** | **0.12** | **0.07** | **64** |

Source: MoHFW, GoI 2023

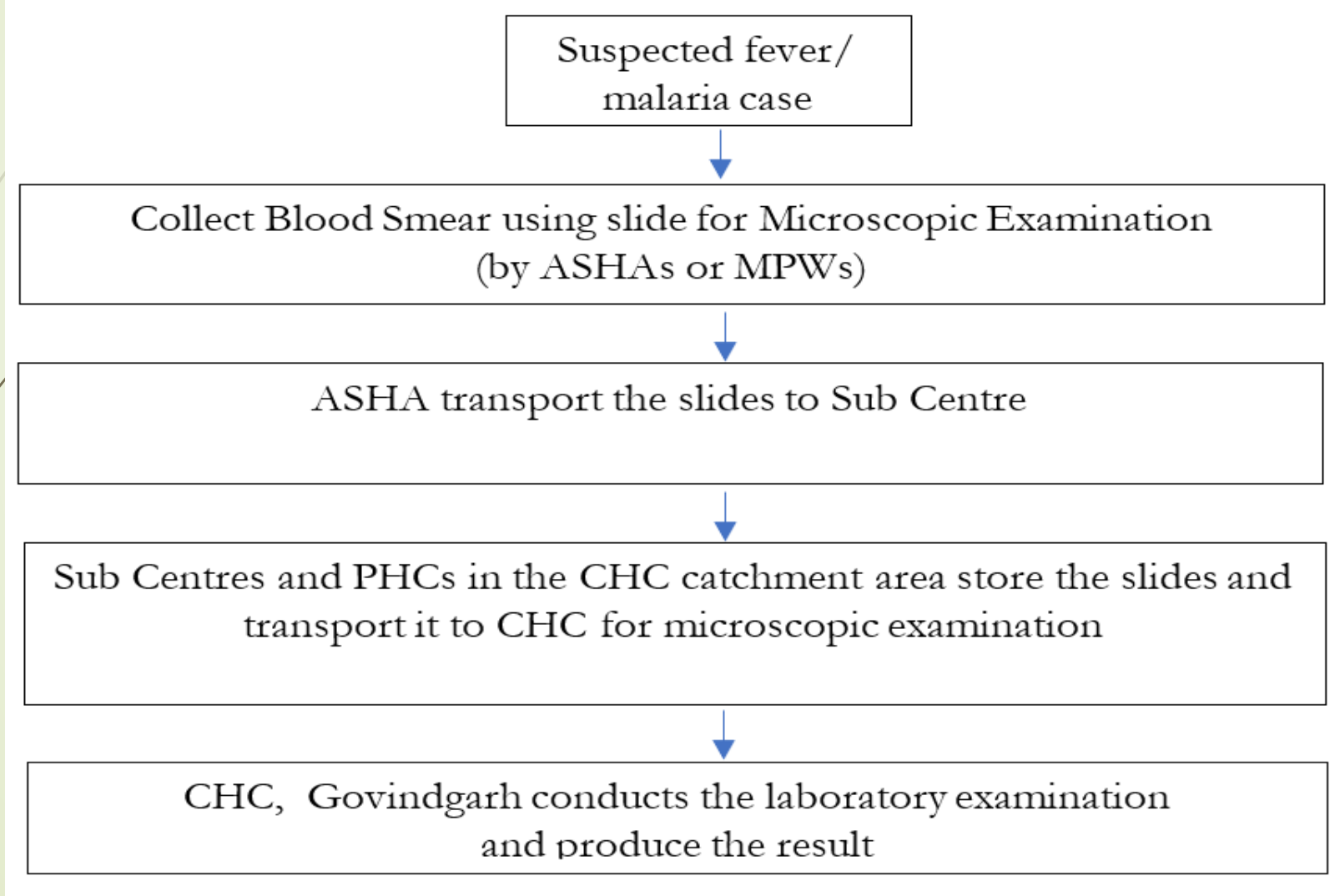
# NVBDCP Organogram




- Responsible for implementation of the program
- Responsible for operational and evaluation
- Responsible for insecticide spray operations
- MO: responsible for overall supervision
- PHC staff: Case detection, treatment, and referral
- MPW: responsible for active surveillance and radical treatment
- LT: examination of blood smears
- Distribute RDT kits and antimalarial drugs
- Confirm diagnosis of malaria for fever cases and provide radical treatment.

Source: Kishore (2020)

# Malaria program design and service delivery in CHC and its catchment area



# Project Work Area

National Vector Borne Disease Control Program with focus on **Malaria prevalence and prevention strategies implementation** in a Government Community Health Centre in the state of Rajasthan

# Objectives

- To examine the malaria **prevalence and related service delivery statistics** from 2020 to 2022 in the catchment area of Community Health Centre, Govindgarh, Rajasthan
- To find the **prevention strategies at present functional** in the catchment area of CHC Govindgarh, Rajasthan
- To identify **enablers and problems** in implementing the prevention strategies in the catchment area of CHC Govindgarh, Rajasthan
- To suggest actions for prioritize problems in implementing the prevention strategies in the catchment area of CHC Govindgarh, Rajasthan

# Methodology: Setting

- Government Community Health Center (CHC), Govindgarh, a rural block of Jaipur district of Rajasthan
- Dhoblai sub-center (currently upgraded to health & wellness centre) in its catchment area

# Methodology: Study Design

- **Mixed method**: Both Quantitative and Qualitative data Collected
- **Tools used**: Pre-designed Checklist and Interview Guide
- **Quantitative data** collected on services related to Malaria and Dengue using defined indicators of mortality, morbidity, and diagnosis.
- **Qualitative data** is collected through review of literature, in-depth interviews and facility observations are focused on understanding about the program, their roles and responsibilities in the program, and challenges faced in executing the services.

# Methodology: Study Design

- Observation was made using the pre-defined indicators in the observation checklist, and covered areas of doctor's room in the out-patient area, IEC materials displayed in the out-patient waiting area, laboratory, and pharmacy.

# Methodology: Participants

- Total 4 in-depth interviews are conducted.
- Data was collected from
  - 1 medical officer (program in-charge) at CHC,
  - 2 Auxiliary Nurse Midwife (ANM) [1 at CHC and 1 at SC]
  - 1 Accredited Social Health Activists (ASHAs) at SC

# Methodology: Ethics

- Ethical approval from Institutional Review Board **was not obtained**.
- Permission **was obtained** from the in-charge of the National Health Mission, Rajasthan
- CHC Govindgarh was selected for the capstone project
- For data collection, informed consent **was obtained** from the participants recruited for in-depth interviews
- Interviews **were not** audio recorded.

# Methodology: Field visit activities

Field visits: March 2023 and May 2023

| Activities Performed | 1st Visit | 2nd Visit | 3rd Visit | 4th Visit |
|---|---|---|---|---|
| | | | | |
| Facility observation at the CHC | | | | |
| Interaction with Lab In-charge and Lab Assistant | | | | |
| Review of Lab registers for Malaria and Dengue | | | | |
| Visit to Dhoblai Sub-Center | | | | |
| Interaction with CHO, ANM, and ASHA | | | | |
| Facility observation at the Sub-Centre | | | | |
| Dta collection: Interview with ANM and ASHA | | | | |
| Discussion on service statistics with the Lab In-Charge and Lab Assistant | | | | |
| Data collection: Observation Checklist | | | | |
| Data collection: Interview with Medical Officer | | | | |
| Field visit to community in the CHC | | | | |
| Data collection: Intervie with dengue patient | | | | |

# Findings: Diagnostic test statistics at the CHC

Objective 1: To examine the malaria prevalence and related service delivery statistics from 2020 to 2022

| | 2020 | 2021 | 2022 | Remarks |
|---|---|---|---|---|
| I. Malaria | | | | |
| A. MICROSCOPY | | | | |
| 1. Total Blood Smear Examined for Malaria | 2160 | 3693 | 4636 | Though testing of blood smear is increased between 2020 to 2022, there are zero +ve cases reported, which shows a contrary pattern with MoHFW data for Rajasthan. |
| 2. Malaria (Microscopy -P Vivax Test +ve) | 0 | 0 | 0 | |
| 3. Malaria (Microscopy -P Falciparum Test +ve) | 0 | 0 | 0 | |
| B. MALARIA RDT | | | | |
| 4. RDT conducted for Malaria | 146 | 202 | 19 | There was an increase in RDT tests by 56 between 2020 and 2021. But drastic reduction of RDT tests happened in 2022. RDT testing data is unavailable from MoHFW |
| 5. Malaria RDT Conducted P Vivax Test +ve) | 3 | 16 | 2 | |
| 6. Malaria RDT Conducted (P Falciparum Test +ve) | 0 | 0 | 0 | |
| 7. Patients Treated on Outpatient Basis for Malaria | 3 | 16 | 2 | |
| 8. Patients admitted with Malaria | 0 | 0 | 0 | |
| 9. Deaths Due to Malaria | 0 | 0 | 0 | It shows similar pattern as MoHFW data for Rajasthan for the last 8 years. |

# Malaria Guideline on diagnosis

Where microscopy result is available within 24 hours,

Step 1: Once the suspected malaria case is identified, blood smear must be collected using slide and must be sent for microscopic examination.

Step 2: Result of the microscopic examination

Step 3: Treatment

**Source: National Strategic Plan for Malaria (2017 – 2022)**

# Findings: Diagnostic test statistics at the CHC

## OPD area

| OPD and Service Provision Area | |
|---|---|
| IEC Related to NVDCP displayed in Facility | Yes |
| Display of treatment guidelines for Malaria | No |
| Provision for temperature measurement of Fever Cases | |
| a) Thermometer | Yes |
| a) Temperature being Measured | Yes |

# Findings: Diagnostic test statistics at the CHC

Objective 1: To examine the malaria prevalence and related service delivery statistics from 2020 to 2022

- All fever cases are consulted in the OPD. There is **no Malaria-specific clinic** (during the assessment probably due to the time was non-seasonal).
- There was no recording or reporting of the fever cases are done in the patient records by the doctors.

[While fever patients visit the OPD, doctor consulted the patients and prescribe medicines as observed during the assessment. During seasonal months (July to November), if the fever patients are undergone microscopy, then the fever cases are recorded in the lab register including the result of the microscopy. **This may be because doctors are unaware or not following treatment guidelines. Treatment guidelines are also not displayed in the doctor's room.]**

- During the assessment, it was observed that temperature is being measured only for the children and not adults.
- There is one poster for malaria is hanged on the wall of waiting area of the OPD.

# Malaria Guideline on case management

Where microscopy result is available within 24 hours,

1) Given the result is positive for vivax, prescribe CQ 3days + PQ 0.25 mg per kg body weight daily for 14 days.

2) Given the result is positive for falciparum, prescribe ACT-SP for 3 days + PQ single dose on second day.

3) Given the result is positive for mixed infection, prescribe ACT-SP 3 days + Primaquine 0.25 mg per kg body weight daily for 14 days.

**Source: National Strategic Plan for Malaria (2017 – 2022)**

# Findings: Diagnostic test statistics at the CHC Laboratory

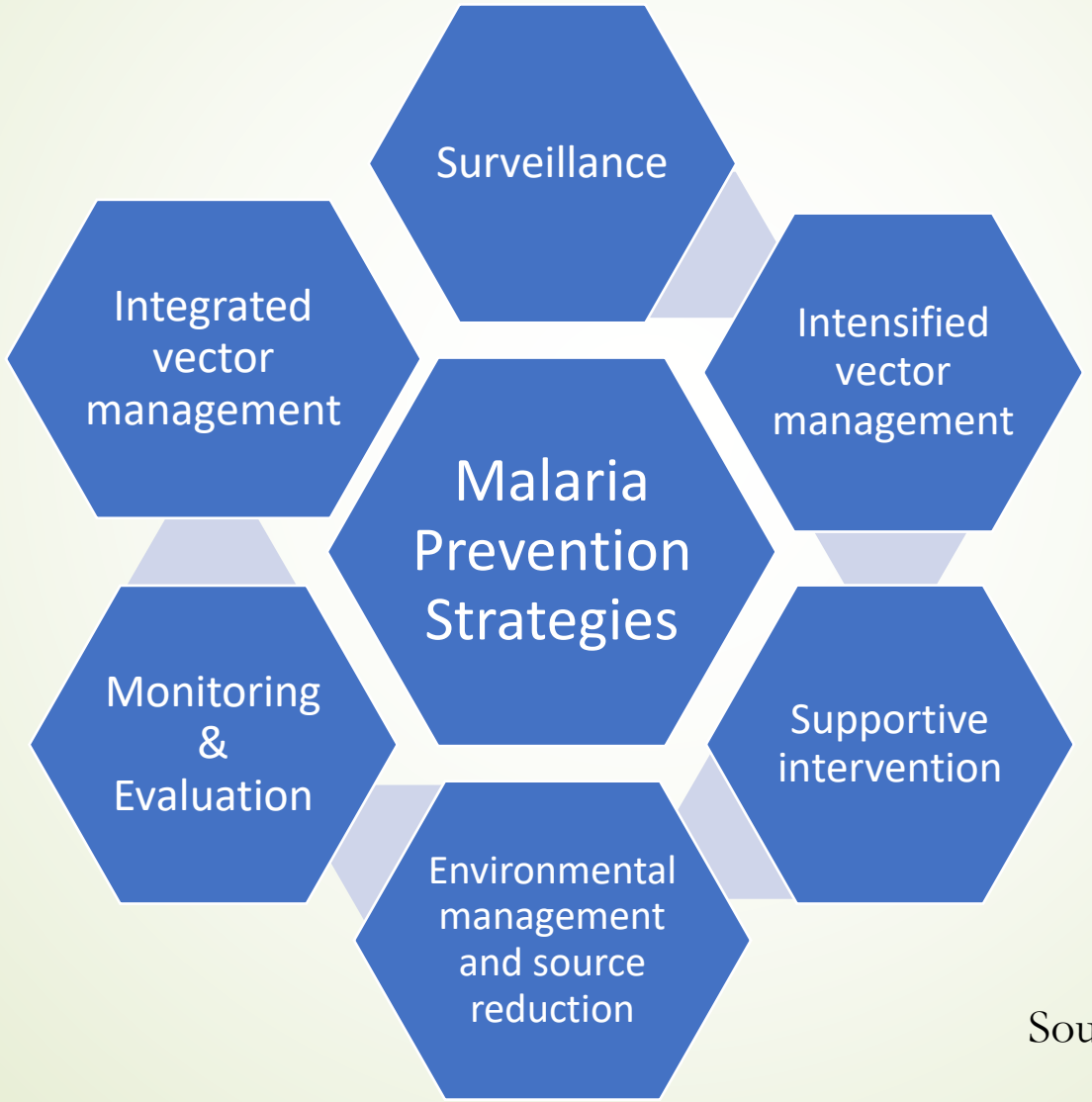
| Laboratory | |
|---|---|
| Lab Technician Availability | Partial |
| Blood Microscopy for Malaria | Being done |
| Maximum Testing Load for Malaria (Per Day) | Approximate 20 per day |
| Reporting of Blood Test for Malaria | |
| Usual Time taken to give report | |
| OPD Samples | 6 hours |
| Field Samples | 12 hours |
| Documentation | |
| OPD Samples | Documented in register |
| Field Samples | Documented in register |
| RDT for Malaria (Antigen) | Bivalent (Pf and Pv cases) |

# Findings: Diagnostic test statistics at the CHC Pharmacy

| Drug Dispensing | |
|---|---|
| a) Chloroquine Tablets | Yes<br>(Available, no supply issues/stockouts in past)<br>500 tab till Apr 2022<br>200 used till Mar 2023 |
| a) Artesunate Combination Therapy | Yes<br>(Available, no supply issues/stockouts in past) |
| a) Injection Artesunate | No |
| a) Quinine Tablets | No |
| a) Quinine Injection | Yes<br>(Available, no supply issues/stockouts in past) |

# Malaria Prevention Strategies

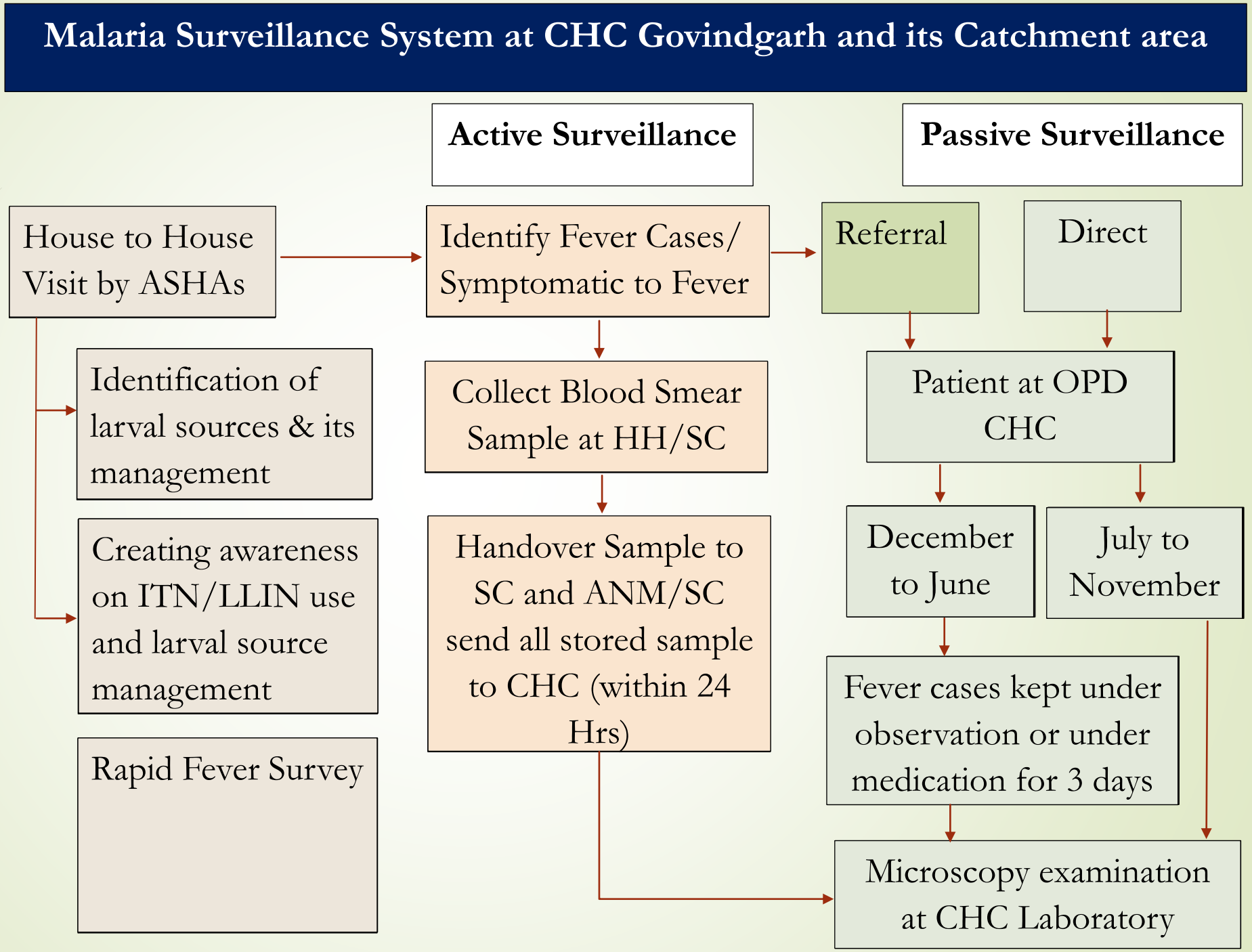
**Objective 2:** To find the **prevention strategies at present functional** in the catchment area of CHC




Source: National Malaria Control Strategy

# Findings

## Surveillance system in the catchment area of CHC



# Findings: Intensified Vector Management

| IVM Strategies | Performance |
|---|---|
| **CHEMICAL CONTROL** | |
| Indoor Residual Spray (IRS) | Yes conducted |
| Use of chemical larvicides | Yes conducted |
| Aerosol space spray during daytime | Yes conducted |
| Malathion fogging during outbreaks | Yes conducted |
| **BIOLOGICAL CONTROL** | |
| Use of larvivorous fish in ornamental tanks, fountains etc. | Not conducted |
| Use of biocides | Not conducted |
| **PERSONAL PROPHYLACTIC MEASURES** | |
| Use of mosquito repellent creams, coils, mats etc. | Awareness created during house visits |
| Screening of the houses with wire mesh | Not conducted |
| Use of bed nets treated with insecticide | Awareness created during hose visits |
| Wearing clothes that cover maximum surface of the body | Awareness created during hose visits |

# Findings: Intensified Vector Management

ASHA said during the interview that

- "*Seasonal spray is done in my area every year. We [ASHAs] also educate people about other prevention measures.*"
- She has mentioned about chemical control measures such as spray have been performed but she couldn't able to explain how and when she has carried out these measures.

# Findings: Supporting interventions

| Supporting intervention strategies | |
|---|---|
| Community participation by sensitizing and involving community for detection of anopheles breeding places, and their elimination | Not conducted |

# Findings:
## Environmental management and source reduction

| Environmental management and source reduction strategies | |
|---|---|
| **Filling up of the breeding places** | Yes conducted through panchayat |
| **Proper covering of stored water** | Yes, create awareness during house visit |
| **Channelization of breeding source** | Not conducted |

ASHA said during the interview, "*I create awareness on improved water storage facility such as for drinking water, water tanks, wells, solid waste disposal, and other mosquito breeding places related to drainage system, which facilitates breeding place for mosquitos.*"

# Findings: Monitoring & Evaluation (M&E)

| Monitoring & Evaluation strategies | |
|---|---|
| Monthly Computerized management information system | Yes conducted |
| Field visits by state/national program officers | Yes conducted |

**Objective 3:** To identify **enablers and problems** in implementing the prevention strategies

# Findings:
# Enablers in malaria prevention program implementation in CHC

- Integrated intervention for Malaria, Dengue and other vector borne diseases
- Active involvement by the gram panchayat
- Rapid fever survey
- Availability of laboratory facility at CHC
- Good leadership by the rapid response team

# Findings: Enablers

## (i) Integrated intervention for Malaria, Dengue and other vector borne diseases

- The doctor said "*integration made it cost-effective, and smoothen logistics and effective allocation of resources and its management in my hospital* [at CHC]."

- ASHA said "*it reduces our work burden somewhat, but still, I have to manage many other program responsibilities.*"

- ANM said "*it is a good initiative by the government.*"

# Findings: Enablers

## (ii) Active involvement by the gram panchayat

The ASHAs, ANM or Community Health Officer at SC said

*"all problems we get like potholes in the road, water logging, unhygienic environment in the villages, we report to panchayat and it is being discussed in the monthly meeting, and actions are taken."*

# Findings: Enablers

## (iii) Rapid fever survey

The doctor said "*rapid fever survey is very beneficial in early detection and good intervention for malaria surveillance.*" Doctor also added "*this survey especially carried out during outbreak, but it was continued due to the COVID-19 pandemic since 2020.*"

# Findings: Enablers

## (iv) Availability of laboratory facility at CHC

Doctor said, "*Though it is not much spacious, we have good lab infrastructure, materials and equipment, but still it needs to be strengthened. There is huge load on the laboratory as all testing of the patients visit OPD and samples from the field are being tested here.*"

# Findings: Enablers

## (v) Good leadership by the rapid response team

While asked the doctor about the composition of the rapid response team, replied "*This is a 5 to 6 member team. Our deputy chief medical officer and divisional CMOHs are part of the team. In addition, there are physician and microbiologists/pathologists from district hospital are also in the team.*"

**Objective 3:** To identify **enablers and problems** in implementing the prevention strategies

# Findings:
# Problems in Malaria prevention strategies implementation in CHC

- Availability of quality data/no documentation of data/ underreported data
- Less community involvement
- Less attention to the NVBDCP program henceforth inadequate number of MPWs for surveillance led to ASHAs burdensome
- Few vector borne disease prevention training for doctors, ASHAs, and ANMs regarding their responsibility under the NVBDCP program

**Objective 4:** To **suggest actions for prioritize problems** in implementing the prevention strategies

# Findings: Suggestive actions Using Feasibility and priority matrix

**(i) Criteria used to identify feasible actions**

- **Swift:** Readily doable in terms of financial and field implementation and possible to execute in less than a year.
- **Challenging**: Doable but expected to require serious efforts and support from Stakeholders.
- **Difficult**: Perceived difficulty in approvals /funding, may require sustained advocacy for convincing the Key Stakeholders / Government and may require a long time to implement.

**(ii) Criteria used for prioritization of actions**

- **Red (Top Priority)** for those which are expected to be more effective in removing the bottlenecks even if they are Challenging.
- **Yellow colour (Intermediate Priority)** depicts those which should be taken up and are considered to improve the functioning although to a lesser extent than the grey ones.
- **Grey (Low Priority)** which the group considers will take lot of efforts and /or yield minimal results.

# Findings: Suggestive actions

| Problems | Suggestive Actions | Feasibility | Priority |
|---|---|---|---|
| **Under-reporting of cases** | Periodic monitoring of the data reported to HMIS | Swift | Top priority |
| | Auditing of the data reported to HMIS | Difficult | Intermediate priority |
| **No/less involvement of community in detection of mosquitos, and their elimination** | Awareness creation on malaria prevention in the community by service providers (through house visits, miking, celebrating health days etc.) | Swift | Top priority |
| | Create and engage community volunteers | Challenging | Top priority |
| **Inadequate number/ no MPWs for surveillance led to ASHAs burdensome** | Filling up of the vacant MPW posts | Difficult | Intermediate priority |
| | Filling up of the vacant ASHA posts | Difficult | Intermediate priority |
| **No documentation/ records of the prevention strategies executed in past years (less importance to prevention)** | Creating indicators of specific prevention strategies/activities in HMIS | Swift | Top priority |
| | Evaluation of the intervention strategies implemented | Swift | Low priority |
| | Establishing Standard Operating Procedures (SOPs) for prevention | Swift | Top priority |

# Findings: Suggestive actions

| Problems | Suggestive Actions | Feasibility | Priority |
|---|---|---|---|
| **Lack of training of doctors, ASHAs, and ANMs regarding their responsibility under the NVBDCP program** | Conducting periodic training | Swift | Intermediate priority |
| | Effective supervision | Swift | Top priority |

# Recommendation for actions

The following 5 actions (falls in **both swift category and top priority** in the feasibility and priority matrix) are recommended for immediate actions,

(i) Awareness creation for malaria prevention

(ii) HMIS data monitoring

(iii) Inclusion of prevention specific indicators in HMIS

(iv) Establishing SOPs for malaria prevention

(v) Effective supervision

# Thank You

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