GIS in MALARIA SURVEILLANCE in Elimination and post elimination VIETNAM

HO QUANG PHUC
1. MALARIA SITUATION IN VIETNAM
2. MALARIA BURDEN IN ETHNIC MINORITIES
3. THE RISE OF ACT RESISTANT PLASMODIUM FALCIPARUM
4. REEMERGENCE OF MALARIA IN NORTH VIETNAM
5. GIS IN VECTOR MAPPING AND ACT RESISTANT MALARIA
6. GIS IN MALARIA SURVEILLANCE SYSTEM
7. MALARIA SURVEILLANCE SYSTEM CHALLENGES
8. REFERENCES
IMPORTANCE AND DISTRIBUTION OF MALARIA

2020 National Malaria Program report

Key figures

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population at risk</td>
<td>6.883.000</td>
</tr>
<tr>
<td>Infected people (2021)</td>
<td>467</td>
</tr>
<tr>
<td>Infected people (2020)</td>
<td>1733</td>
</tr>
<tr>
<td>Infected people (2019)</td>
<td>4665</td>
</tr>
<tr>
<td>Number of tests administered (2020)</td>
<td>1.797.469</td>
</tr>
</tbody>
</table>

2020 National Malaria Program report
Importance and distribution of malaria

Key figures

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Eliminated province (2019)</td>
<td>25</td>
</tr>
<tr>
<td>Eliminated province (2020)</td>
<td>35</td>
</tr>
<tr>
<td>Eliminated province (2022)</td>
<td>42</td>
</tr>
</tbody>
</table>

2022 Malaria Elimination report
## Malaria Burden in Ethnic Minorities

### At Risk Population
- **2015**: 22,633,769
- **2016**: 22,930,525
- **2017**: 23,227,282
- **2018**: 23,524,038
- **2019**: 23,820,795
- **2020**: 24,117,552

### Cases (Total)
- **2015**: 9,331
- **2016**: 4,161
- **2017**: 4,548
- **2018**: 4,813
- **2019**: 4,665
- **2020**: 1,422

### Cases (Ethnic Minority)
- **2015**: 6,815
- **2016**: 3,126
- **2017**: 3,615
- **2018**: 3,259
- **2019**: 3,389
- **2020**: 1,041

### Percentage
- **2015**: 73.04%
- **2016**: 75.13%
- **2017**: 79.49%
- **2018**: 67.71%
- **2019**: 72.65%
- **2020**: 73.21%

### Deaths
- **2015**: 3
- **2016**: 3
- **2017**: 6
- **2018**: 1
- **2019**: 0
- **2020**: 1*  

Total ethnic minority population in Vietnam (2020): 13,386,330  
2020 National Malaria Program report  
*Death due to COVID19 complication
Parasitaemia D3 (2015)

<table>
<thead>
<tr>
<th>Location</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Gia Lai</td>
<td>22.8%</td>
</tr>
<tr>
<td>Quang Nam</td>
<td>30%</td>
</tr>
<tr>
<td>Binh Phuoc</td>
<td>50%</td>
</tr>
<tr>
<td>Ninh Thuan</td>
<td>10.9%</td>
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</table>

K13 mutation prevalence 26%

2020 National Malaria Program report
REEMERGENCE OF MALARIA IN NORTH VIETNAM

Cases in Lai Chau province

<table>
<thead>
<tr>
<th>Year</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>5</td>
</tr>
<tr>
<td>2019</td>
<td>56</td>
</tr>
<tr>
<td>2020</td>
<td>58</td>
</tr>
<tr>
<td>2021</td>
<td>101</td>
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</table>

2020 National Malaria Program report
GIS in passive and active surveillance

MAPPING OF VECTOR AND ACR RESISTANCE MALARIA

[Map of vector and ACR resistance in Vietnam]
MALARIA SURVEILLANCE SYSTEM

Within 1 day
(local health-care facility)

- All suspected fever cases

Laboratory/ Clinically diagnosed case

- Report by hospital within 1 day to web-based national case report system

Within 3 days
(county China CDC where the case is reported)

- Case classification

  - Imported
  - Local

- Case confirmation by double microscopy & PCR at central lab

- Case investigation

Within 7 days
(county China CDC where the patient resides and/or works)

Focus investigation

- Active foci
- Inactive foci
- Pseudo foci

Geographic RACD & IRS

Demographic RACD & health education

Thank you
REFERENCES

1. National malaria report 2020, Vietnam Malaria control Program, 2021
6. Dr James Kelley (MPH, PhD) WPRO, Manila, Philippines