



GIS in MALARIA SURVEILLANCE in Elimination and post elimination VIETNAM

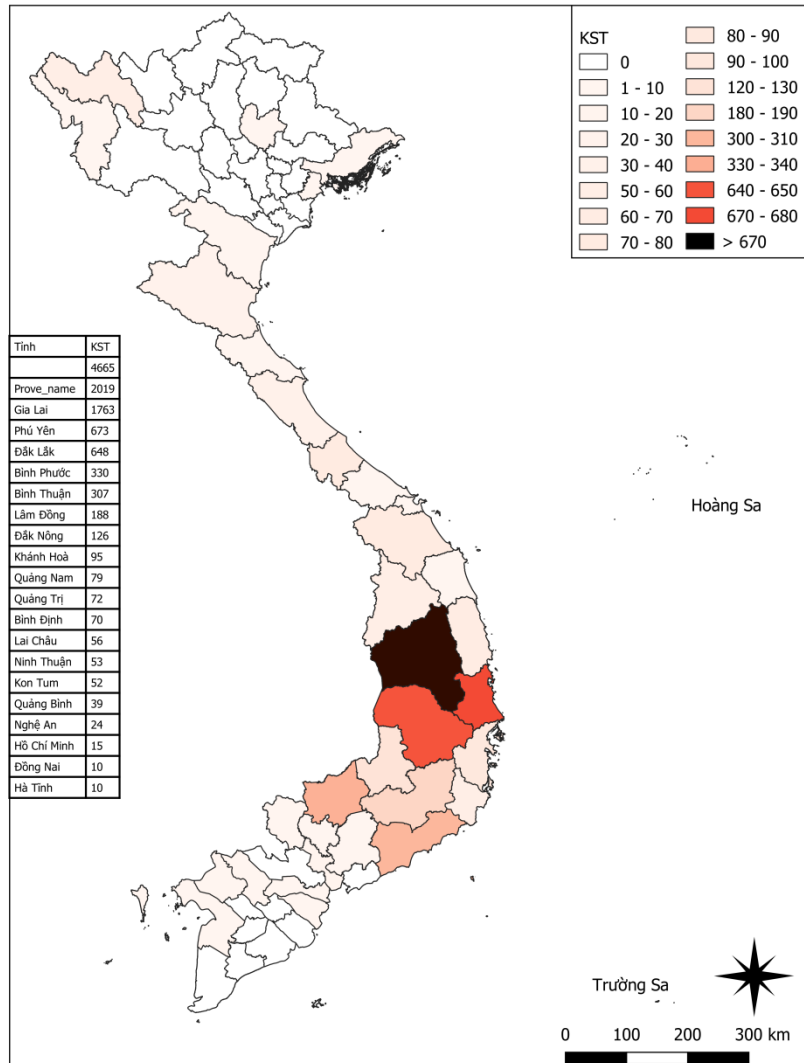
HO QUANG PHUC

CONTENT

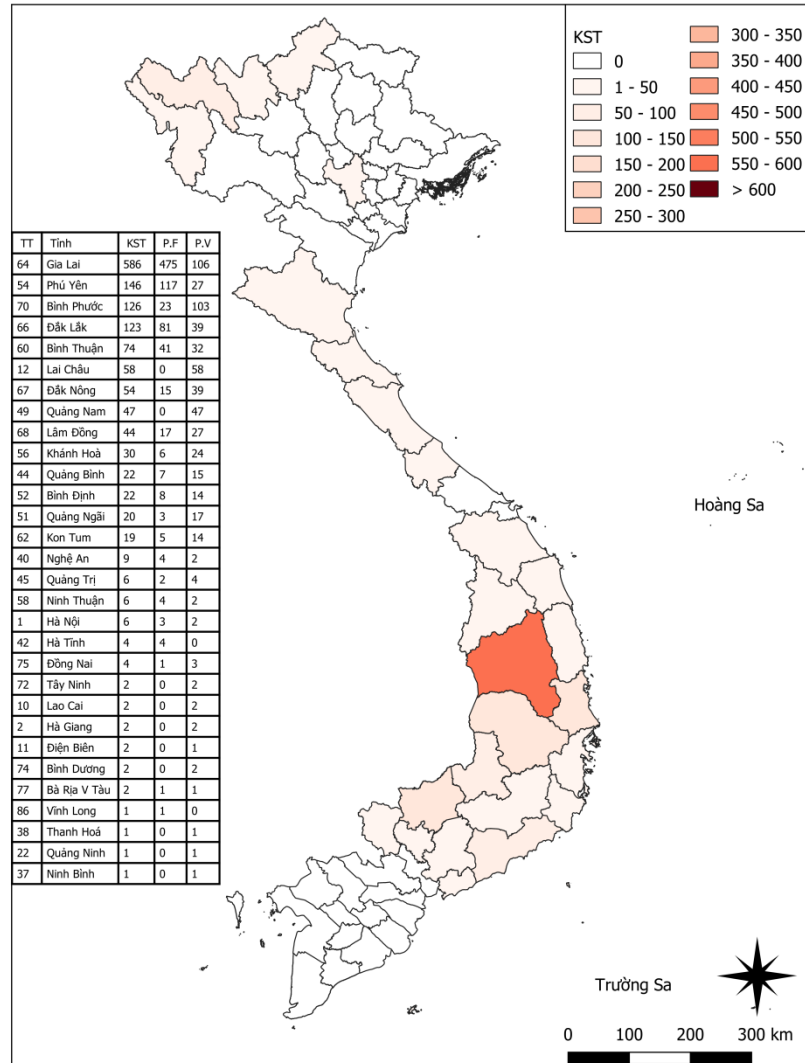
1. MALARIA SITUATION IN VIETNAM
2. MALARIA BURDEN IN ETHNIC MINORITIES
3. THE RISE OF ACT RESISTANT PLASMODIUM FALCIPARUM
4. REEMERGENCE OF MALARIA IN NORTH VIETNAM
5. GIS IN VECTOR MAPPING AND ACT RESISTANT MALARIA
6. GIS IN MALARIA SURVEILLANCE SYSTEM
7. MALARIA SURVEILLANCE SYSTEM CHALLENGES
8. REFERENCES

IMPORTANCE AND DISTRIBUTION OF MALARIA

SỐ KÝ SINH TRÙNG CẢ NƯỚC
2019



SỐ KÝ SINH TRÙNG CẢ NƯỚC
12 tháng năm 2020



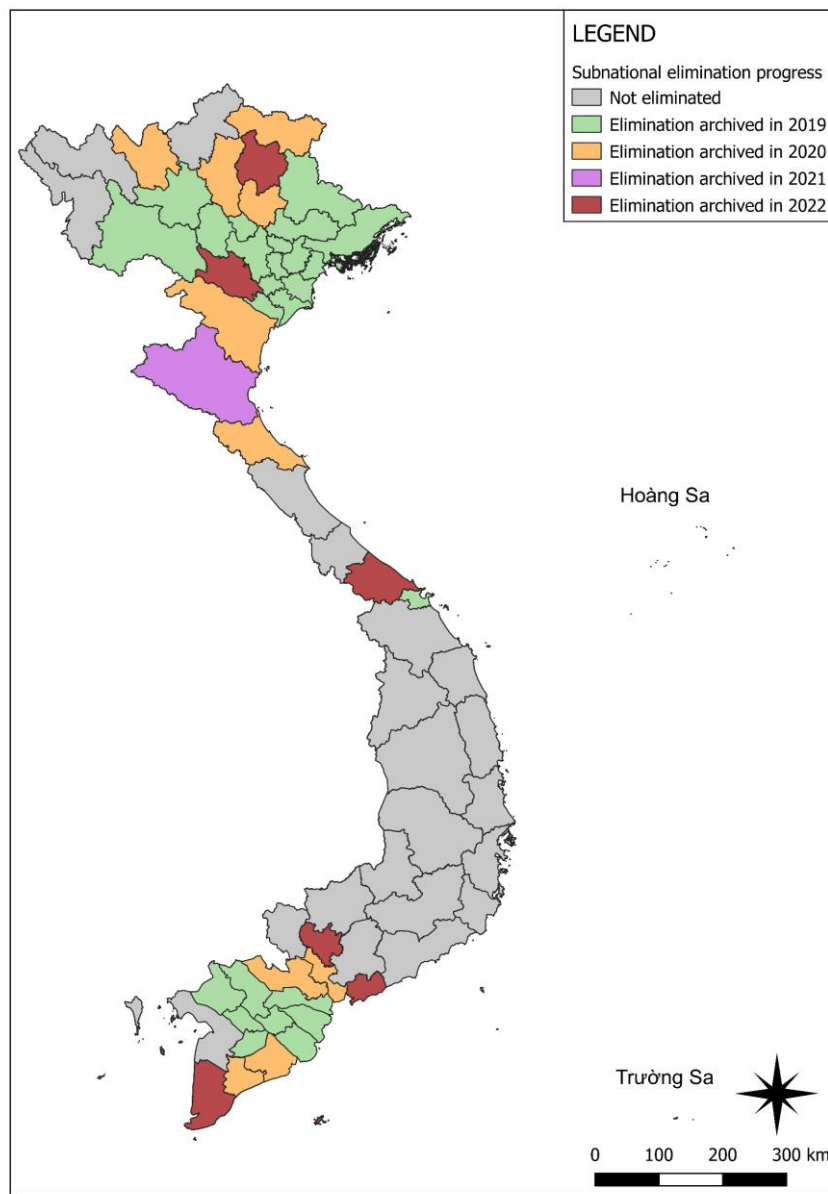
Key figures



Population at risk	6.883.000
Infected people (2021)	467
Infected people (2020)	1733
Infected people (2019)	4665
Number of test administered (2020)	1.797.469

2020 National Malaria Program report

Importance and distribution of malaria



Key figures

Eliminated province (2019)	25
Eliminated province (2020)	35
Eliminated province (2022)	42

MALARIA BURDEN IN ETHNIC MINORITIES

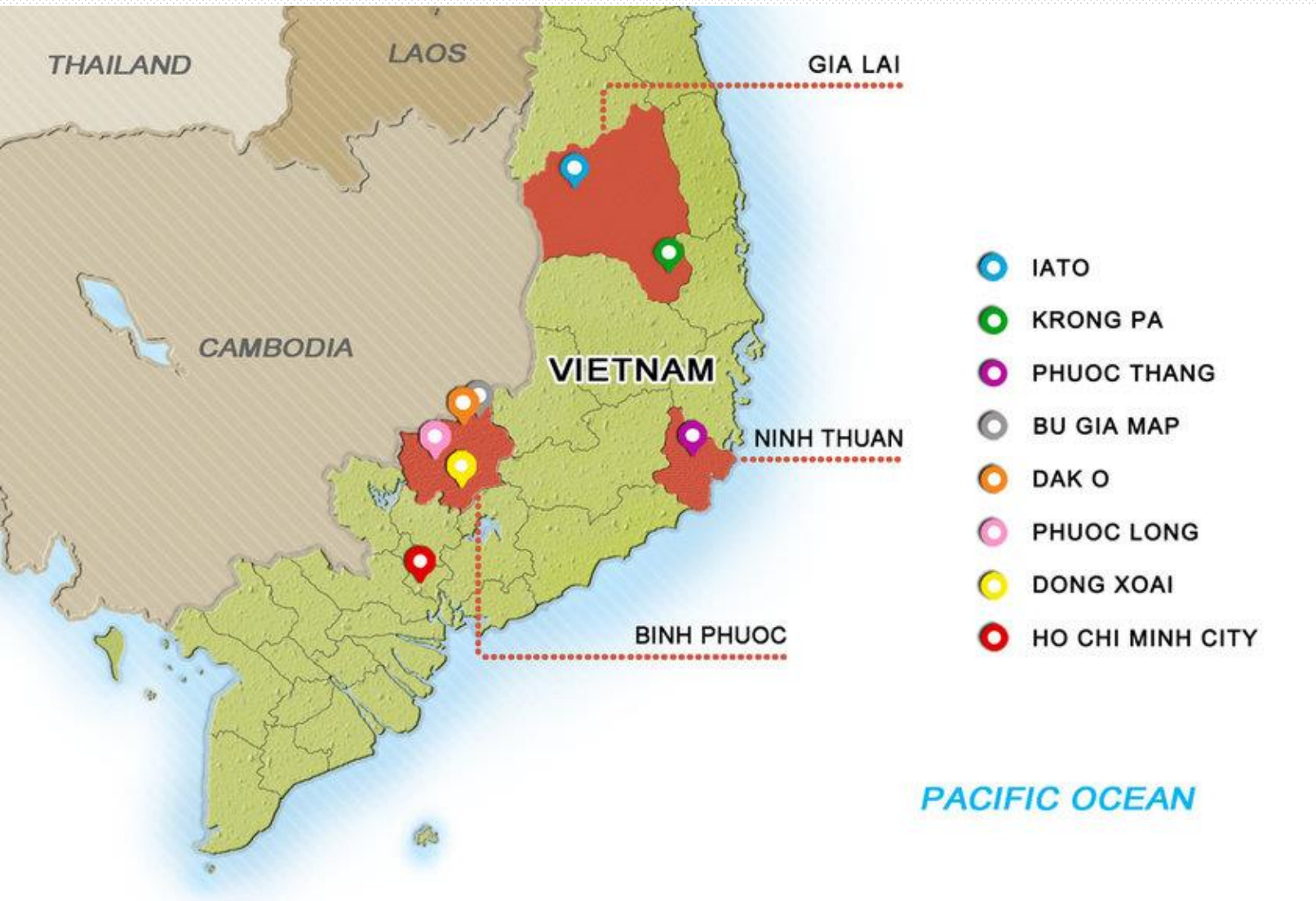
	2015	2016	2017	2018	2019	2020
At risk population	22.633.769	22.930.525	23.227.282	23.524.038	23.820.795	24.117.552
Cases (total)	9.331	4.161	4.548	4.813	4.665	1.422
Cases (ethnic minority)	6.815	3.126	3.615	3.259	3.389	1.041
Percentage	73.04	75.13	79.49	67.71	72.65	73.21
Deaths	3	3	6	1	0	1*


Total ethnic minority population in Vietnam (2020): 13.386.330

2020 National Malaria Program report

*Death due to COVID19 complication

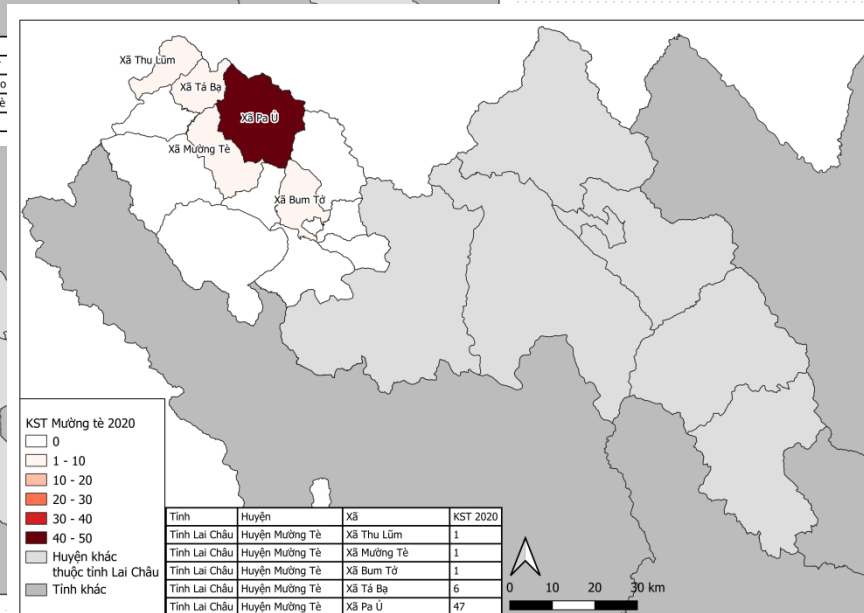
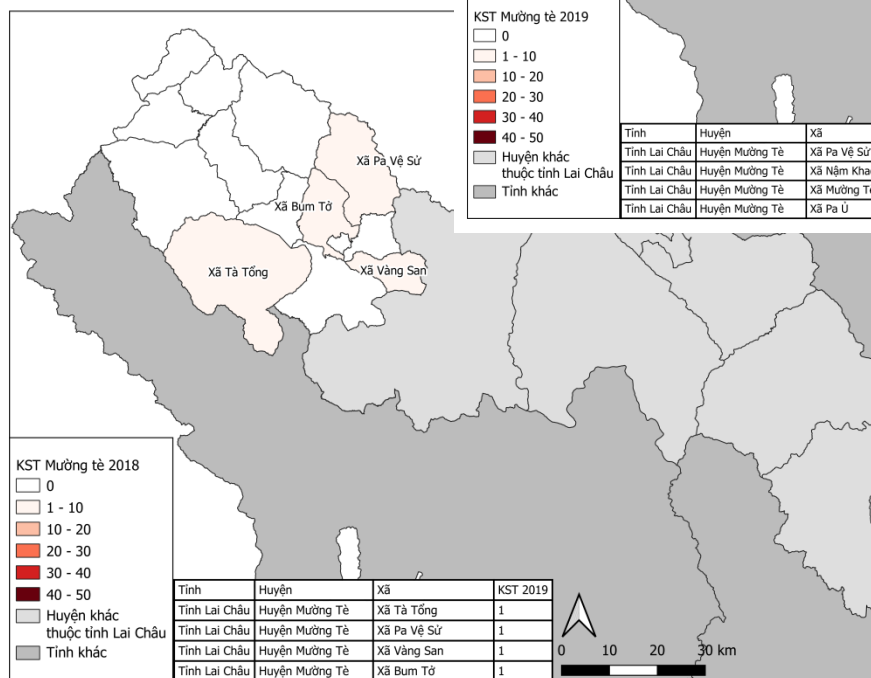
THE RISE OF ACT RESISTANT PLASMODIUM FALCIPARUM



Parasitaemia D3 (2015)	
Gia Lai	22..8%
Quang Nam	30%
Binh Phuoc	50%
Ninh Thuan	10.9%
K13 mutation prevalence	26%

2020 National Malaria Program report
 Nguyen, Thuy-Nhien Tuyen, (2017). K13-Propeller Mutations in Plasmodium falciparum Populations in Malaria Endemic Regions of Vietnam from 2009 to 2016. Antimicrobial Agents and Chemotherapy. . 61. AAC.01578-16. 10.1128/AAC.01578-16.

REEMERGENCE OF MALARIA IN NORTH VIETNAM



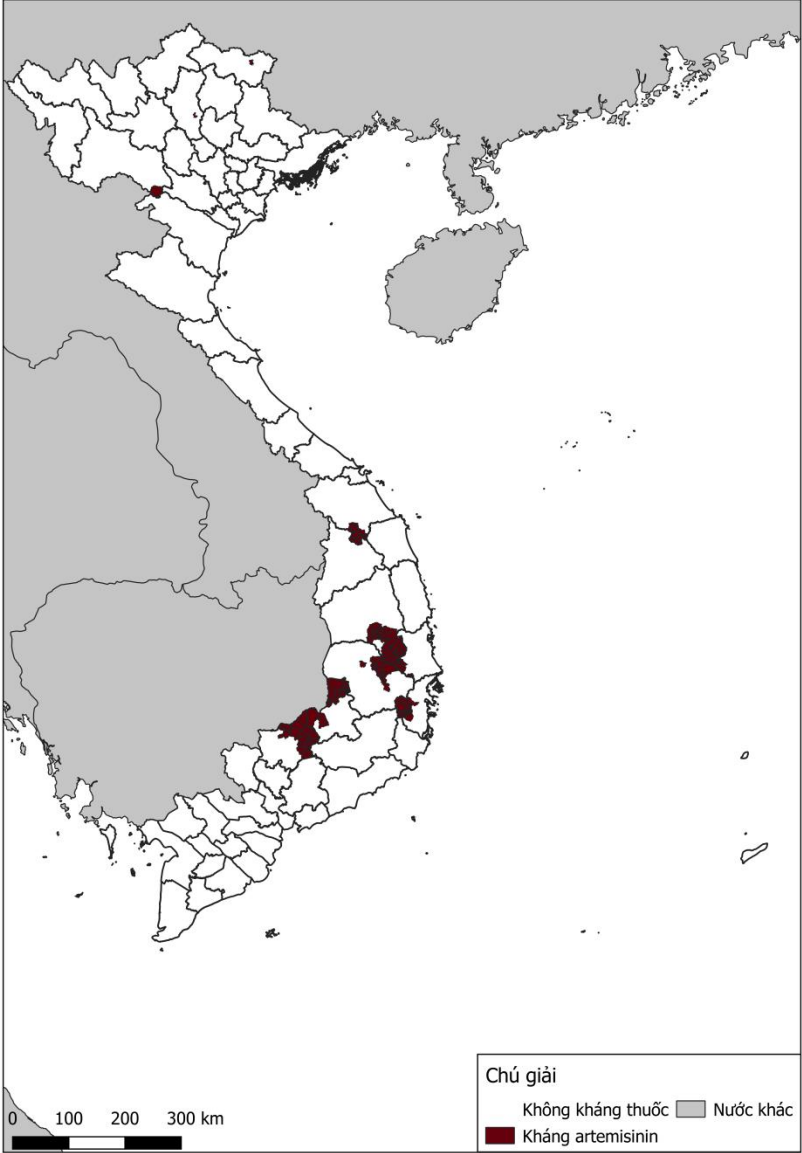
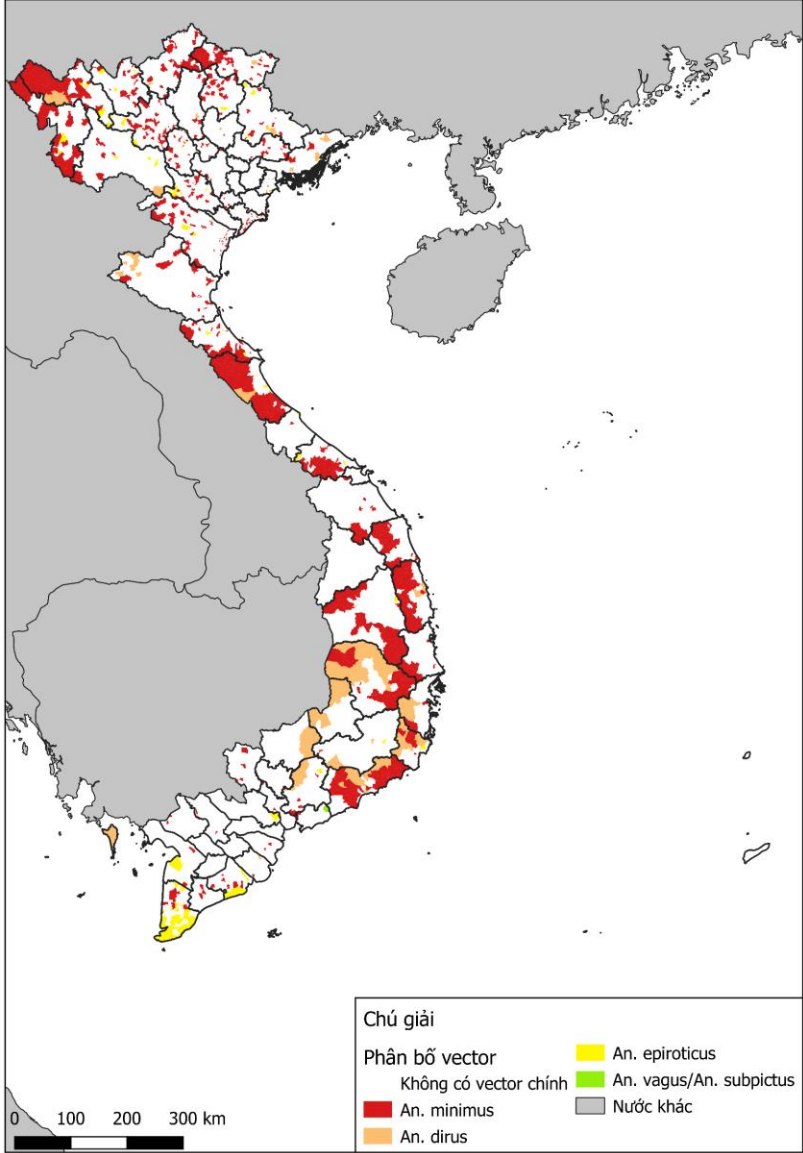
Cases in Lai Chau province		
2018	5	5
2019	56	56
2020	58	58
2021	101	101

GIS in passive and active surveillance

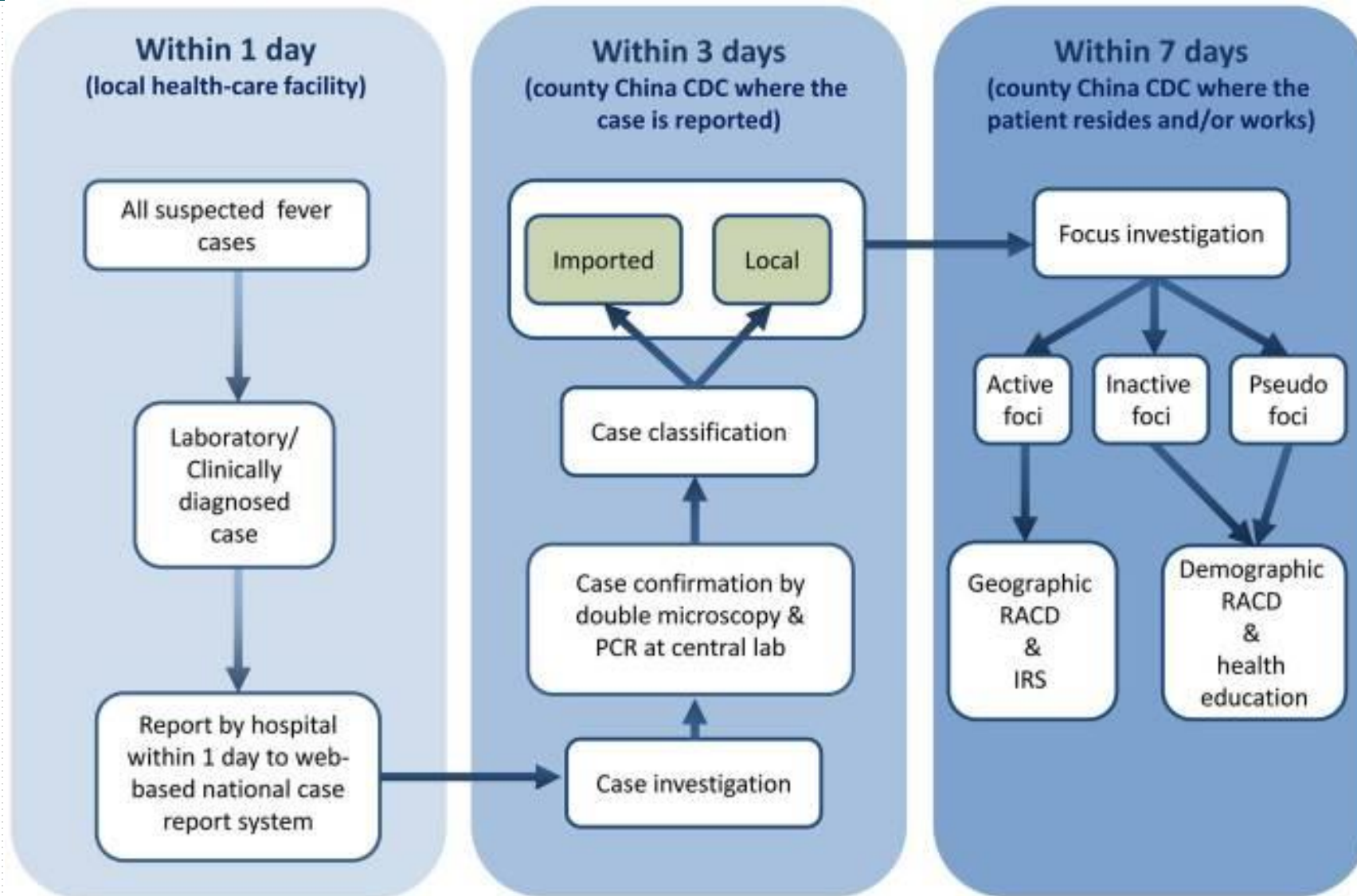


Source: <https://baodantoc.vn/he-luy-dang-sau-nghe-hot-bac-o-muong-te-1616318370712.htm>

MAPPING OF VECTOR AND ACR RESISTANCE MALARIA



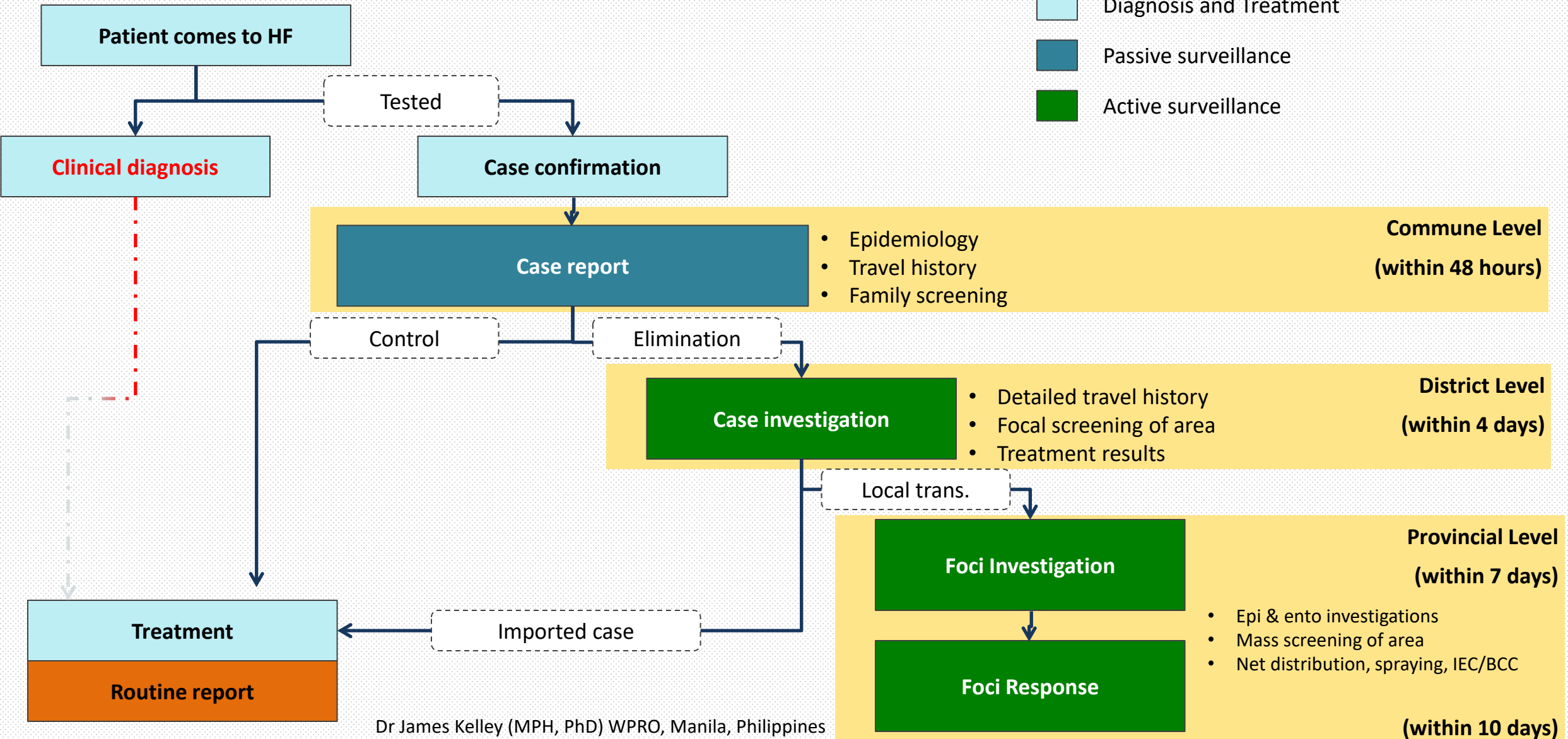
MALARIA SURVEILLANCE SYSTEM



Cao, J., Sturrock, H. J., Cotter, C., Zhou, S., Zhou, H., Liu, Y., Tang, L., Gosling, R. D., Feachem, R. G., & Gao, Q. (2014). Communicating and monitoring surveillance and response activities for malaria elimination: China's "1-3-7" strategy. *PLoS medicine*, 11(5), e1001642. <https://doi.org/10.1371/journal.pmed.1001642>

MALARIA SURVEILLANCE SYSTEM

- Diagnosis and Treatment
- Passive surveillance
- Active surveillance





Thank you

REFERENCES

1. National malaria report 2020, Vietnam Malaria control Program, 2021
2. 2019 Vietnam National Census, General Statistics Office of Vietnam, 2020
3. Nguyen, Thuy-Nhien Tuyen, (2017). K13-Propeller Mutations in Plasmodium falciparum Populations in Malaria Endemic Regions of Vietnam from 2009 to 2016. Antimicrobial Agents and Chemotherapy. . 61. AAC.01578-16. 10.1128/AAC.01578-16.
4. Nguyen TT, Nguyen XX, Ronse M, Nguyen QT, Ho PQ, Tran DT, Gerrets R, Thriemer K, Ley B, Marfurt J, Price RN, Grietens KP, Gryseels C. Diagnostic Practices and Treatment for *P. vivax* in the InterEthnic Therapeutic Encounter of South-Central Vietnam: A Mixed-Methods Study. Pathogens. 2021; 10(1):26. <https://doi.org/10.3390/pathogens10010026>
5. Cao, J., Sturrock, H. J., Cotter, C., Zhou, S., Zhou, H., Liu, Y., Tang, L., Gosling, R. D., Feachem, R. G., & Gao, Q. (2014). Communicating and monitoring surveillance and response activities for malaria elimination: China's "1-3-7" strategy. PLoS medicine, 11(5), e1001642. <https://doi.org/10.1371/journal.pmed.1001642>
6. Dr James Kelley (MPH, PhD) WPRO, Manila, Philippines