The role of indigenous researchers in enabling impactful research

Moses Laman

PNG Institute of Medical Research

How do we engage in impactful research?

PARTNERSHIP BROKERS ASSOCIATION
LEARNING • TRAINING • TRANSFORMING

Engaging in appropriate partnership principles:

1. Mutual benefit (think about how everyone can benefit)
2. Equity (recognising power imbalances exist in research)
3. Diversity (explore and recognise added value that comes with diversity)
4. Openness (trust and understanding hidden agenda)
5. Have the courage to be frank (despite our culture)

Current priorities

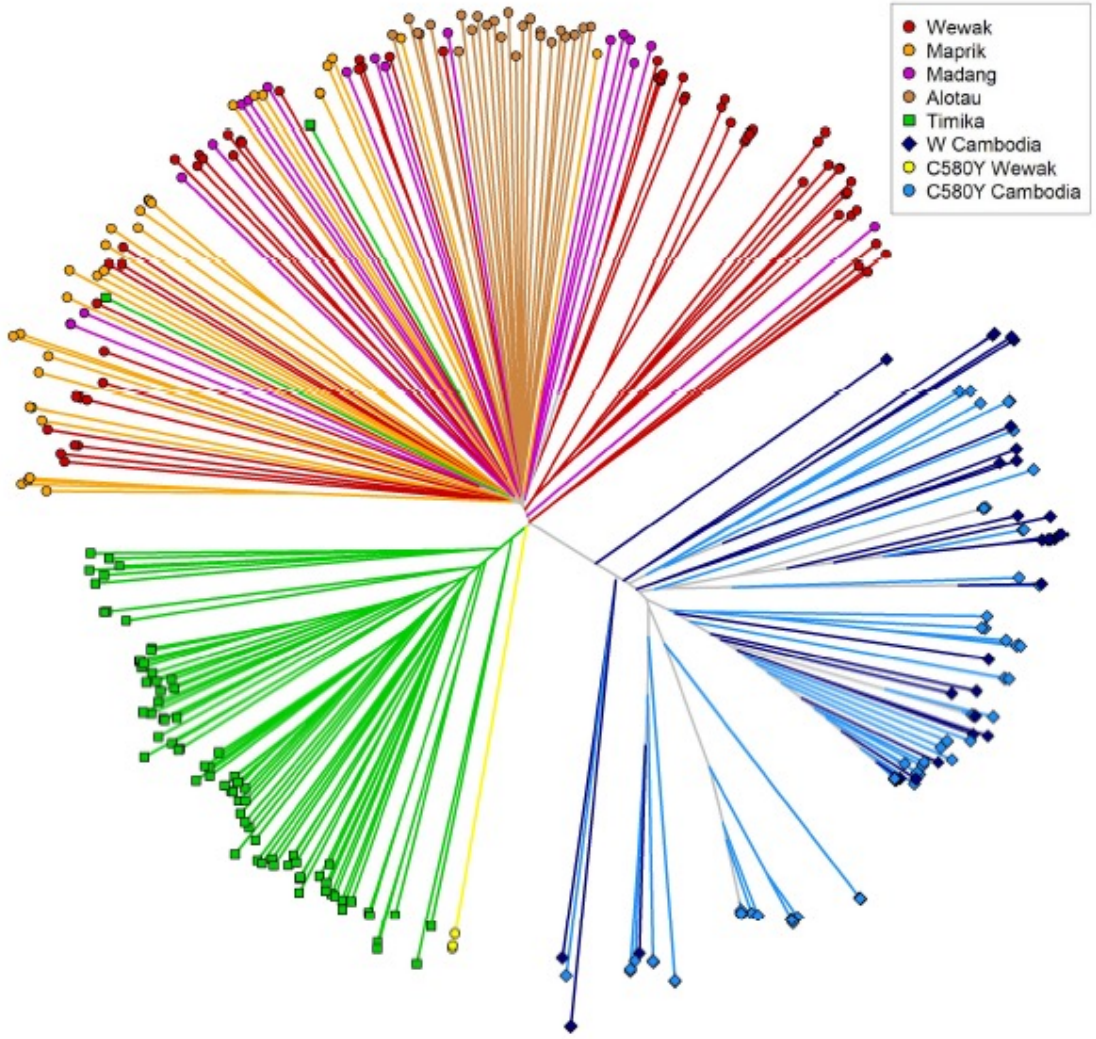
Malaria

- Artemisinin resistance
- Trends in malaria burden
- Insecticide resistance monitoring
- Vector Control tools
- Vivax malaria

Lymphatic filariasis

- Policy change - elimination efforts
- Treatment of adult worm
- MDA stopping criteria
- Integrated approach (NTD)

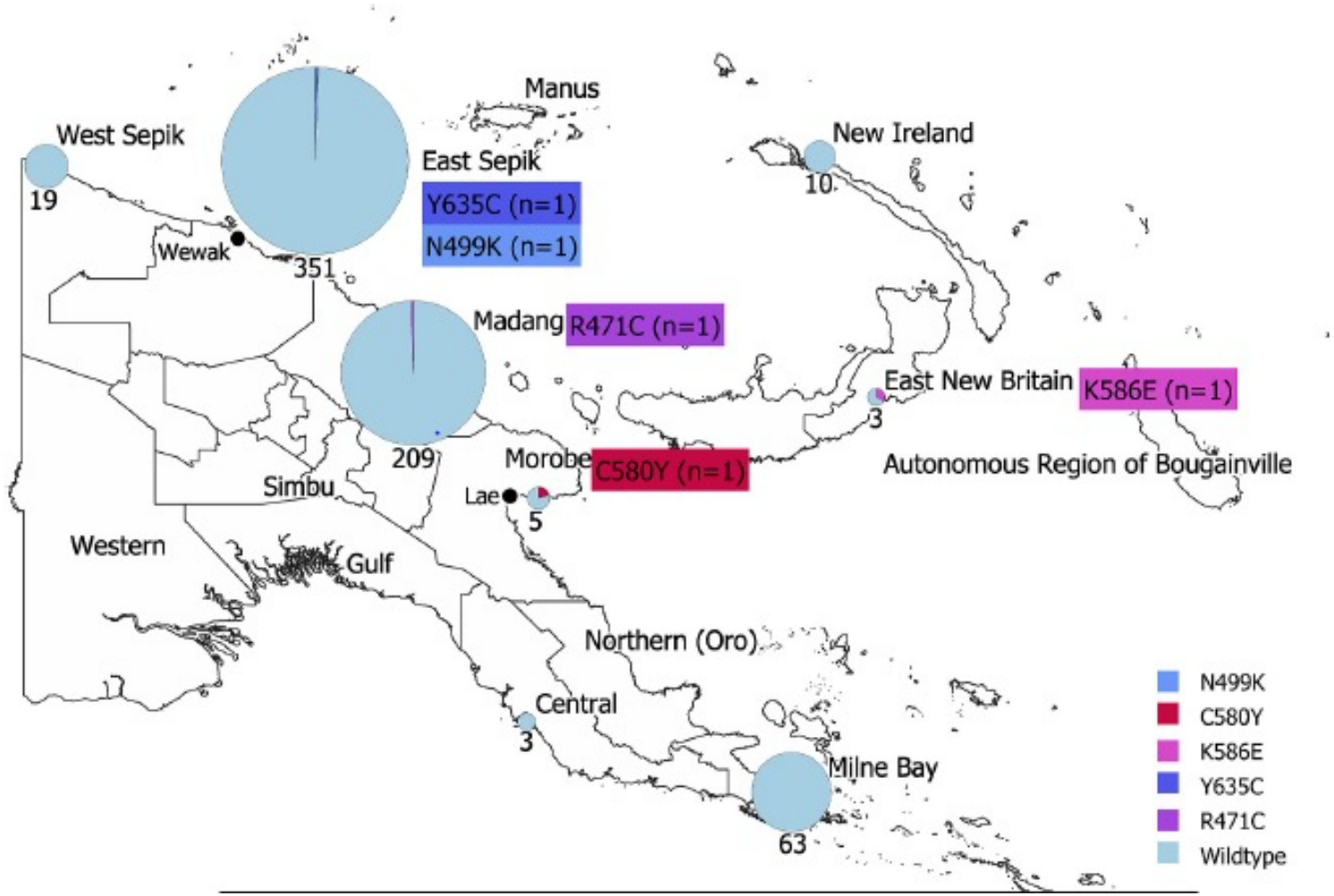
Artemisinin resistance (C580Y)



Miotto et al, 2020

Artemisinin resistance

International Journal for Parasitology: Drugs and Drug Resistance 16 (2021) 188–193



Therapeutic efficacy studies n=13/139 (9.4%)

	ID	Day 0	Day 3	Day 7
Patient 1	TEK029	+	-	-
Patient 2	TEK043	+	-	-
Patient 3	TEK044	+	-	-
Patient 4	TEK045	+	-	-
Patient 5	TEK050	+	-	-
Patient 6	TGM015	+	+	-
Patient 7	TGM019	+	-	-
Patient 8	TGM020	+	-	-
Patient 9	TGM037	+	+	+
Patient 10	TGM049	+	+	-
Patient 11	TGM062	+	-	-
Patient 12	TGM074	+	-	-
Patient 13	TGM039	+	-	-

The bed-net story

nature COMMUNICATIONS

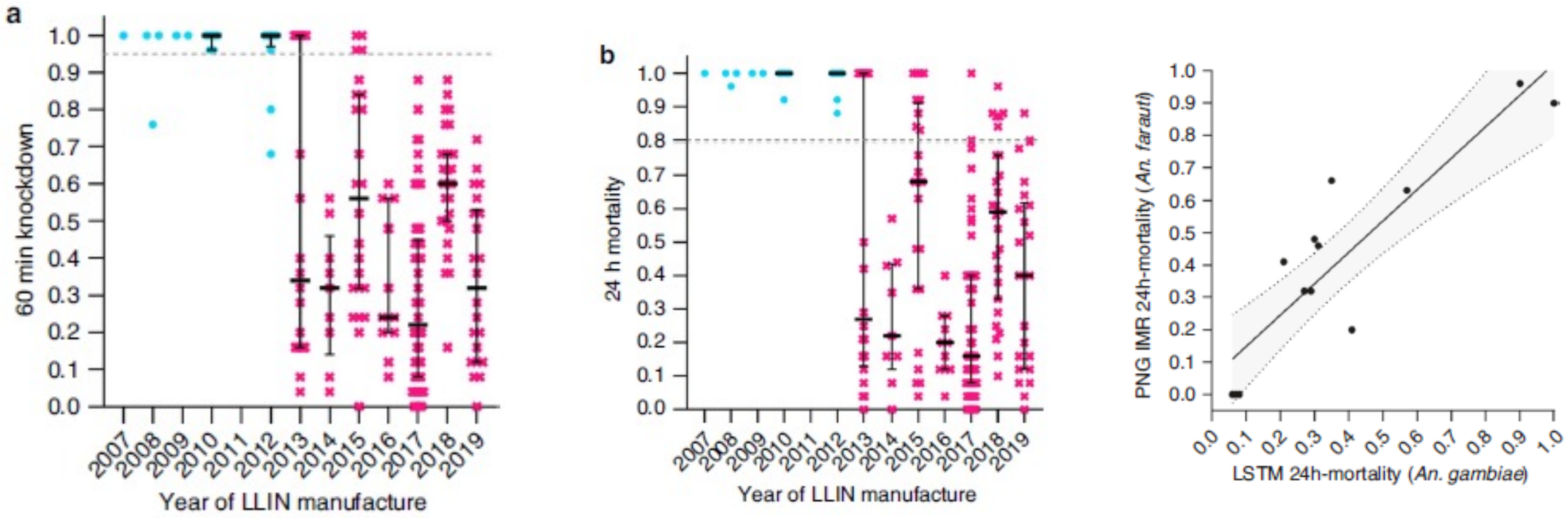
ARTICLE

https://doi.org/10.1038/s41467-020-17456-2 OPEN

Decreased bioefficacy of long-lasting insecticidal nets and the resurgence of malaria in Papua New Guinea

Rebecca Vinit[1,8], Lincoln Timinao[1,2,8], Nakei Bubun[1,8], Michelle Katusele[1,8], Leanne J. Robinson[1,3], Peter Kaman[1], Muker Sakur[1], Leo Makita[4], Lisa Reimer[5], Louis Schofield[2], William Pomat[1], Ivo Mueller[6], Moses Laman[1], Tim Freeman[7] & Stephan Karl[1,2]✉

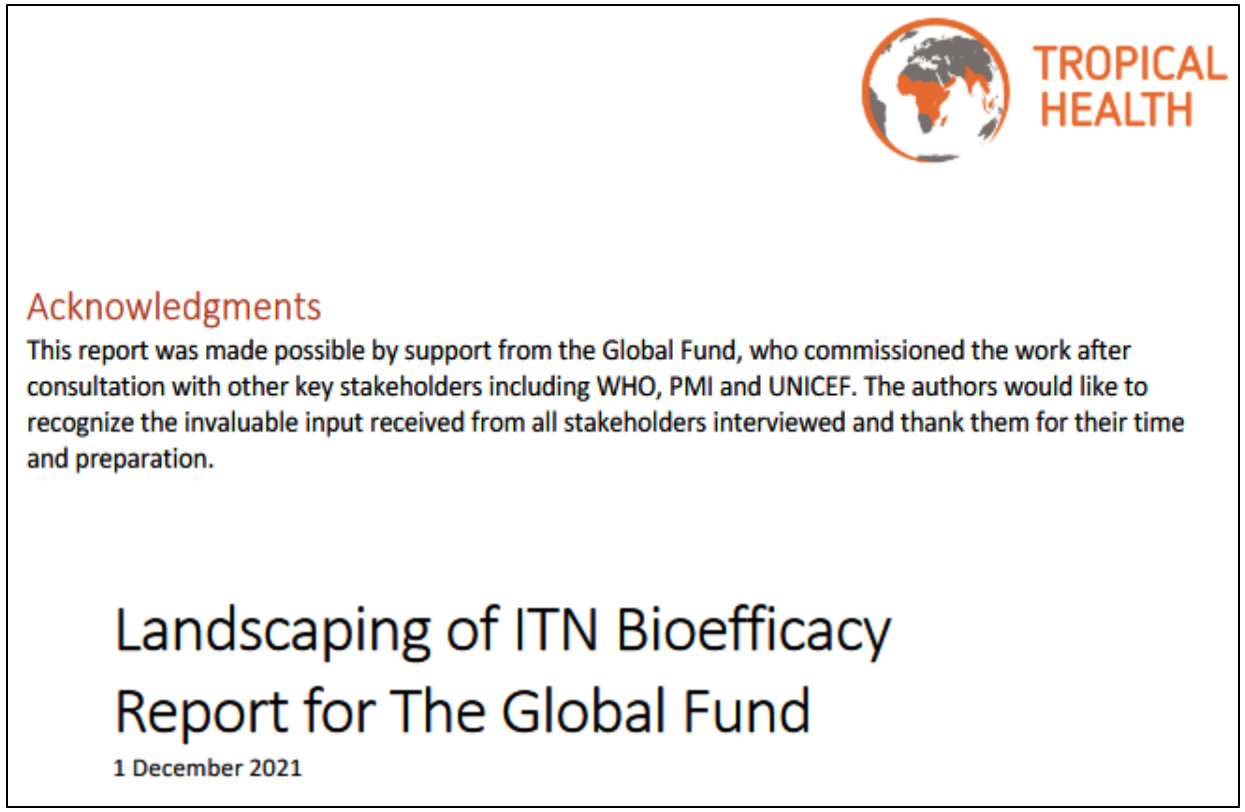
Reduced LLIN bioefficacy after 2012



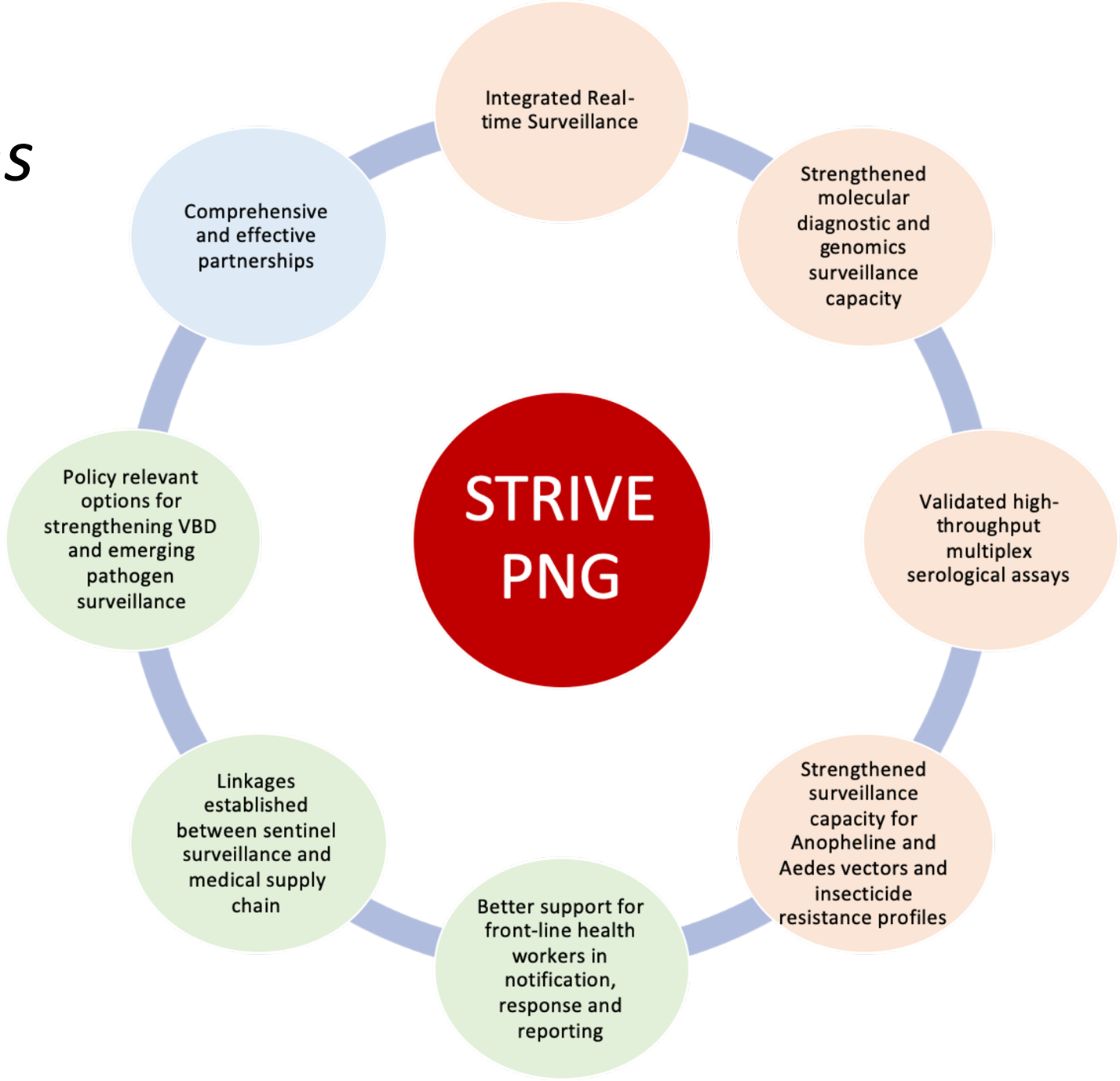
Vinit R, Nature Communications 2020

Local and global impact

- WHO Global Director – Malaria
- Global Fund
- Other countries followed
- Change in LLIN brand locally
- Monitoring continues
- Relevance of PNGIMR



STRIVE PNG:
Program Aims



NATNAT CORE OBJECTIVES

1. Strengthen laboratory, semi-field and field capacity to test new VCTs in PNG

2. Conduct rigorous field evaluations of new VCTs

3. Investigate the community and health system acceptability and cost analysis of new VCTs

4. Support a NMCP-led formal network for vector control tools and interventions in PNG

Strengthen laboratory, semi-field and field capacity to test new VCTs in PNG

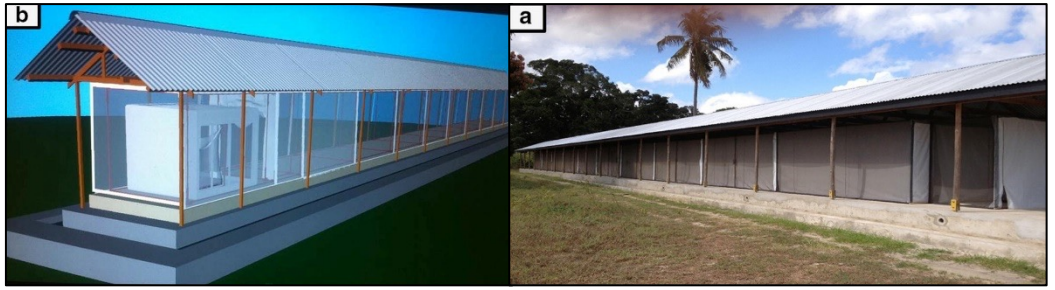
- Build capacity for testing of residual spraying products, larvicides and spatial emanators
- Plan to extend the existing PNGIMR Entomology facilities
- Establish a semi-field testing site

Belna natnat research centre

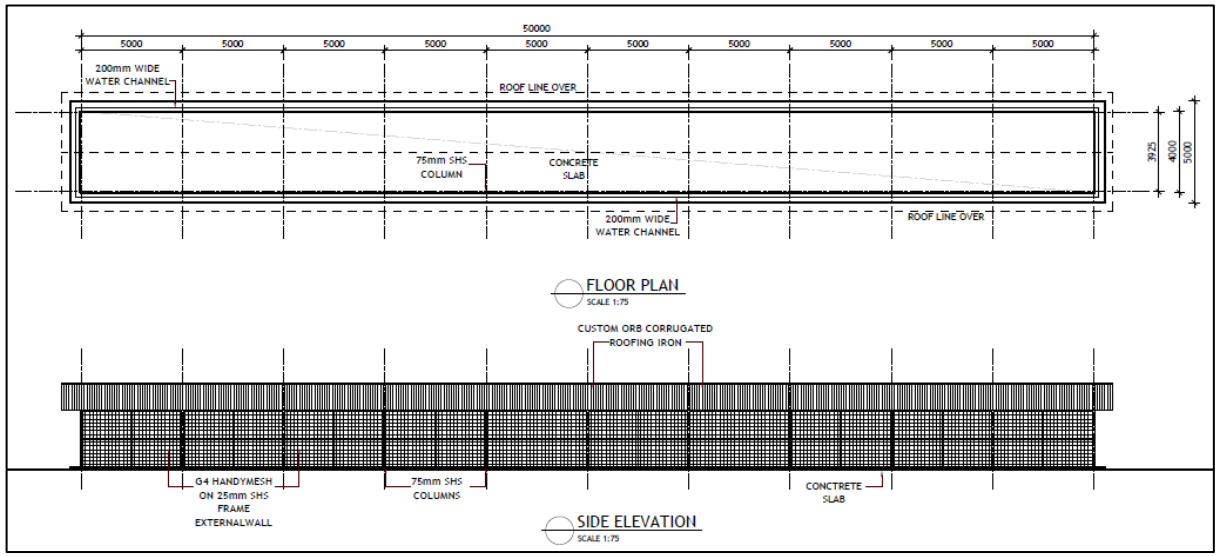
Strengthen laboratory, semi-field and field capacity to test new VCTs in PNG

Mosquito Tunnel

- Mosquito tunnel will be used to study various VCT products, in particular spatial emanators and LLINs

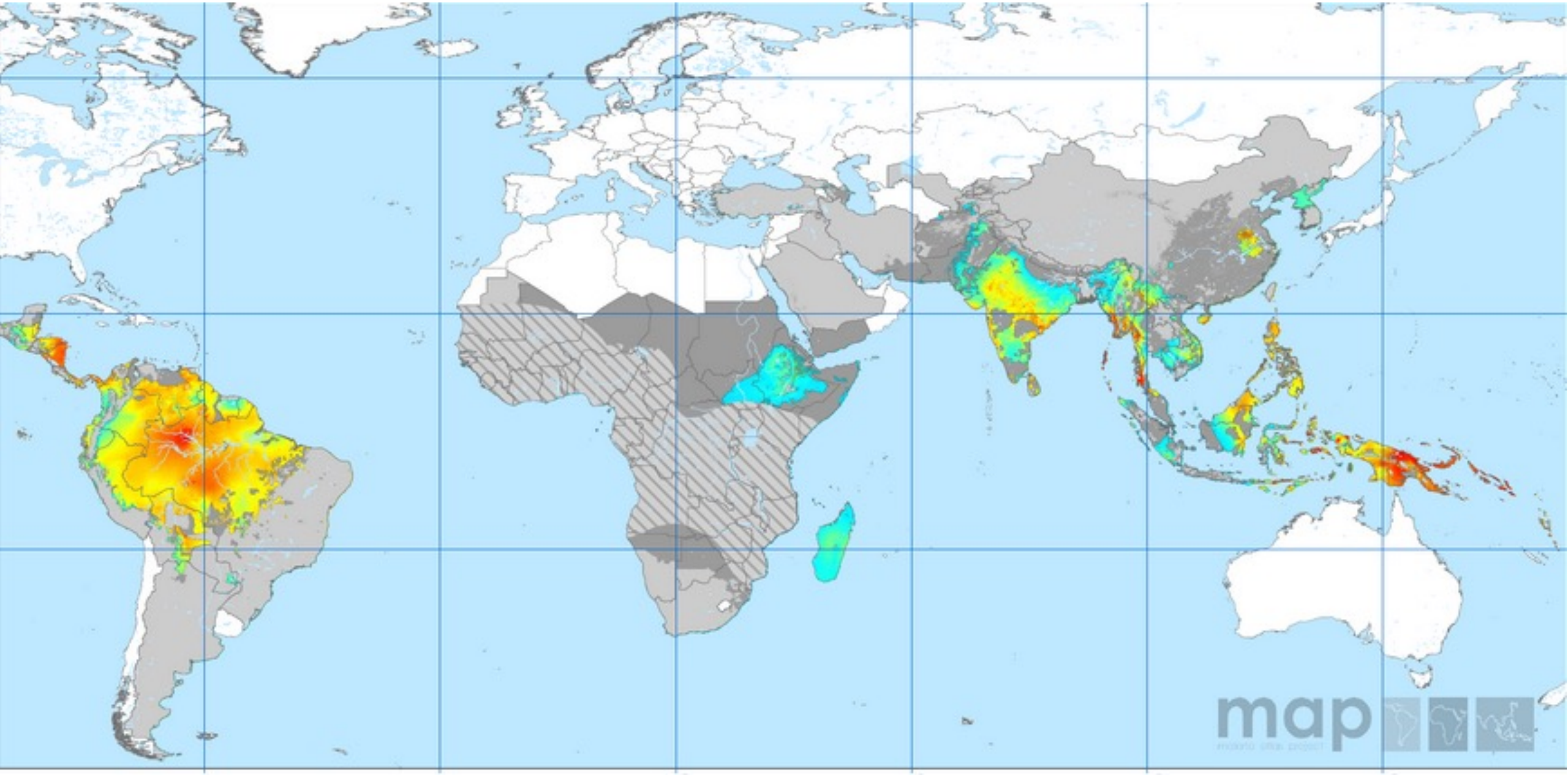


Mosquito Tunnel (I-ACT) in Tanzania (Massue et al., 2019)

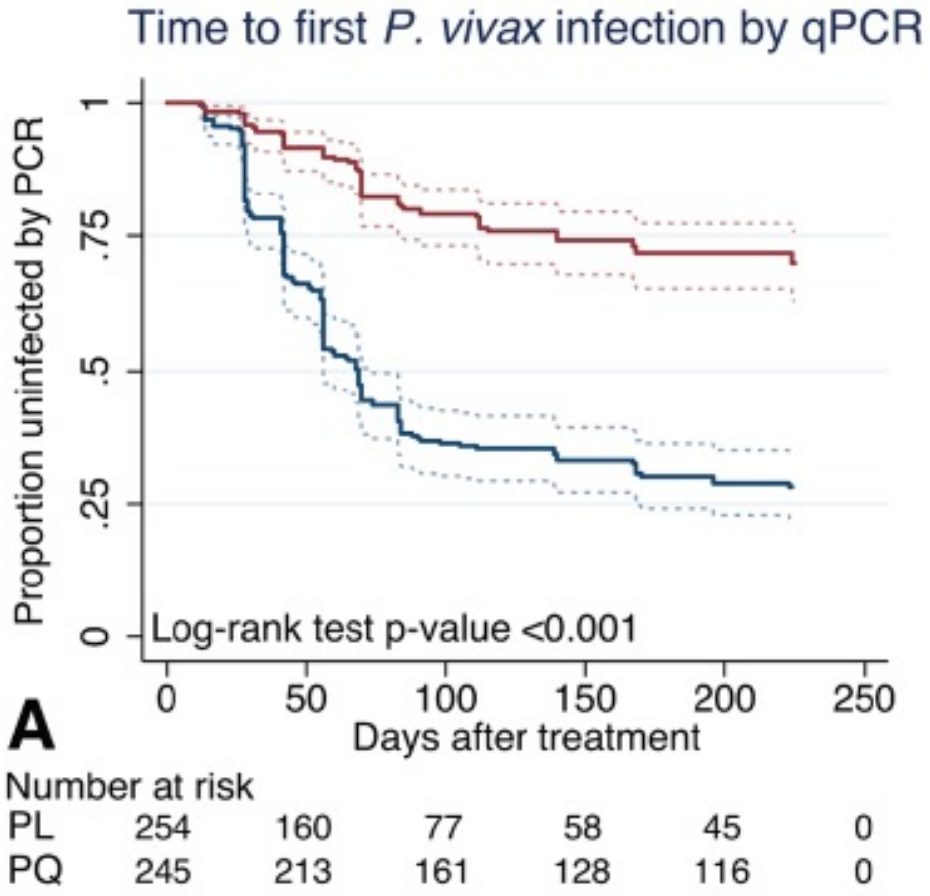


Mosquito tunnel at Gum site taking shape

Global Burden of Vivax Malaria

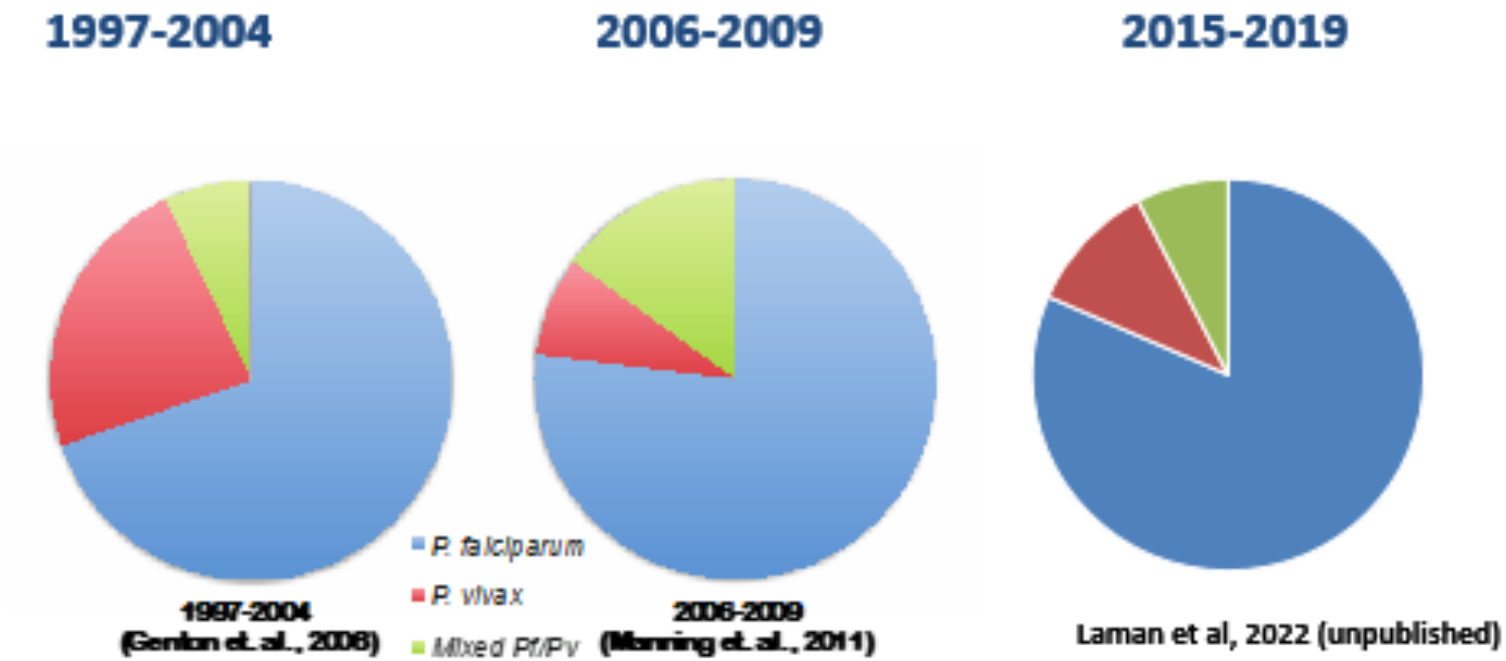


Relapses account for 80% Pv infections



Robinson et al, Plos Med 2015

Hospital surveillance of P vivax admissions



- 8-23% of severe malaria cases due to *Pv* alone
- 7-15% of mixed *Pf/Pv* infections

Current practice in PNG

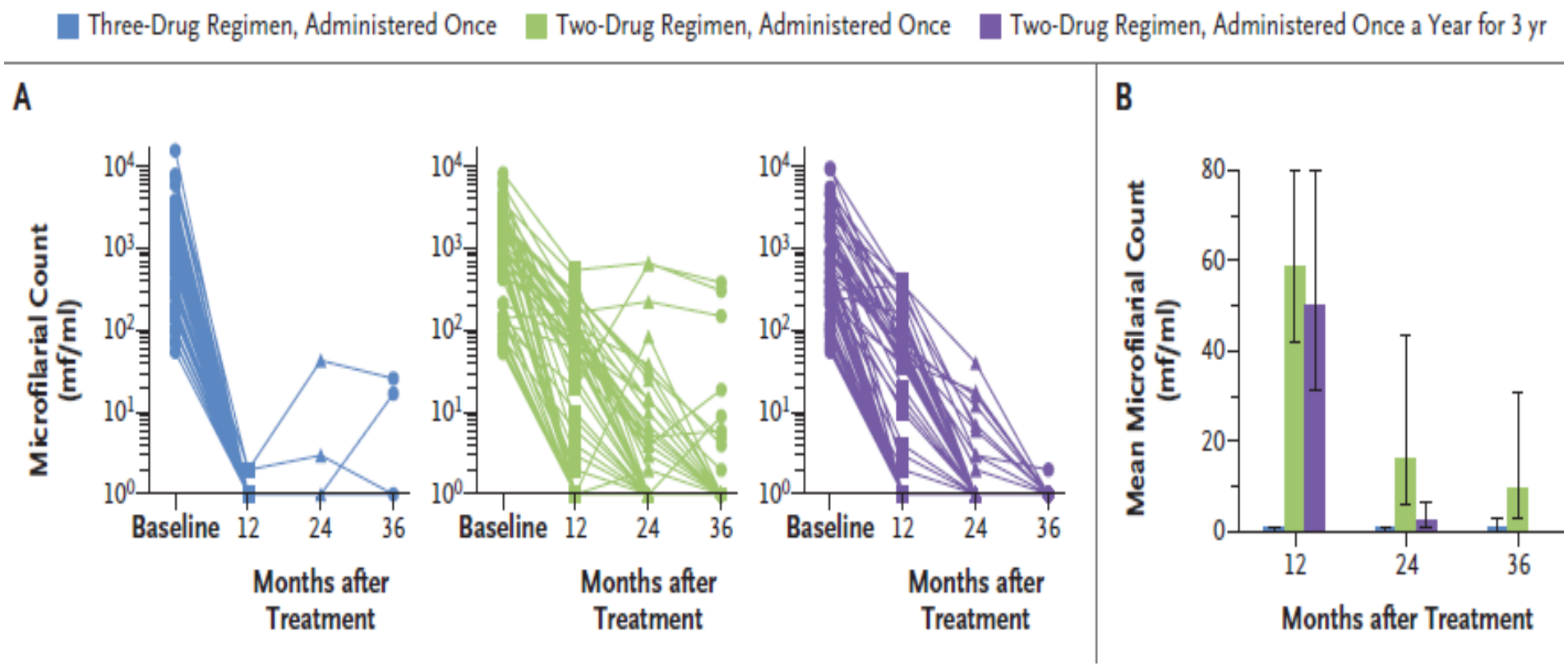
- Routine pre-treatment G6PD testing is not available
- Primaquine 3.5mg/kg total dose over 14 days + artemether-lumefantrine
- No treatment supervision during treatment with PQ
- Drug supply challenges in facilities that need primaquine the most
- No formal pharmacovigilance system of monitoring for primaquine use

1. Strengthening vivax surveillance in PNG

2. **S**hort **CO**urse **P**rimaquin**E** for the radical cure of *P. vivax* (SCOPE)

PAPUA NEW GUINEA INSTITUTE OF MEDICAL RESEARCH

Lymphatic filariasis studies – IMR Sepik



King C, NEJM 2018

PLOS | MEDICINE

RESEARCH ARTICLE

The safety of double- and triple-drug community mass drug administration for lymphatic filariasis: A multicenter, open-label, cluster-randomized study

Gary J. Weil[1]*, Joshua Bogus[1], Michael Christian[2], Christine Dubray[3], Yenny Djuardi[2], Peter U. Fischer[1], Charles W. Goss[1], Myra Hardy[4], Purushothaman Jambulingam[5], Christopher L. King[6], Vijesh Sridhar Kuttiat[5], Kaliannagounder Krishnamoorthy[5], Moses Laman[7], Jean Frantz Lemoine[8], Katiuscia K. O'Brian[1], Leanne J. Robinson[7,9], Josaia Samuela[10], Kenneth B. Schechtman[1], Anita Sircar[3], Adinarayanan Srividya[5], Andrew C. Steer[4], Taniawati Supali[2], Swaminathan Subramanian[5], the DOLF IDA Safety Study Group[¶]

1 Washington University, St. Louis, Missouri, United States of America, **2** Universitas Indonesia, Jakarta, Indonesia, **3** Centers of Disease Control and Prevention, Atlanta, Georgia, United States of America, **4** Murdoch Children's Research Institute, Melbourne, Australia, **5** ICMR-Vector Control Research Centre, Puducherry, India, **6** Case Western Reserve University, Cleveland, Ohio, United States of America, **7** Papua New Guinea Institute of Medical Research, Madang, Papua New Guinea, **8** Ministère de la Santé Publique et de la Population (MSPP), Port-au-Prince, Haïti, **9** Burnet Institute, Melbourne, Australia, **10** Fiji Ministry of Health and Medical Services, Suva, Fiji

Triple drug was safe and efficacious (n=26,836)

Table 1. Filarial infection prevalence in the study sites.

Site	District	Mf Prevalence[a]
Fiji	Gau	33/1,957 (1.7%)
	Rotuma	106/1,454 (7.3%)
Haiti	Northern Dept	114/5,987 (1.9%)
India	Yadgir	591/8,825 (6.7%)
Indonesia	Flores	20/1,254 (1.6%)
	Sumba	94/2,667 (3.5%)
PNG	Bogia	199/4,518 (4.4%)

GUIDELINE

ALTERNATIVE MASS DRUG ADMINISTRATION REGIMENS TO ELIMINATE LYMPHATIC FILARIASIS

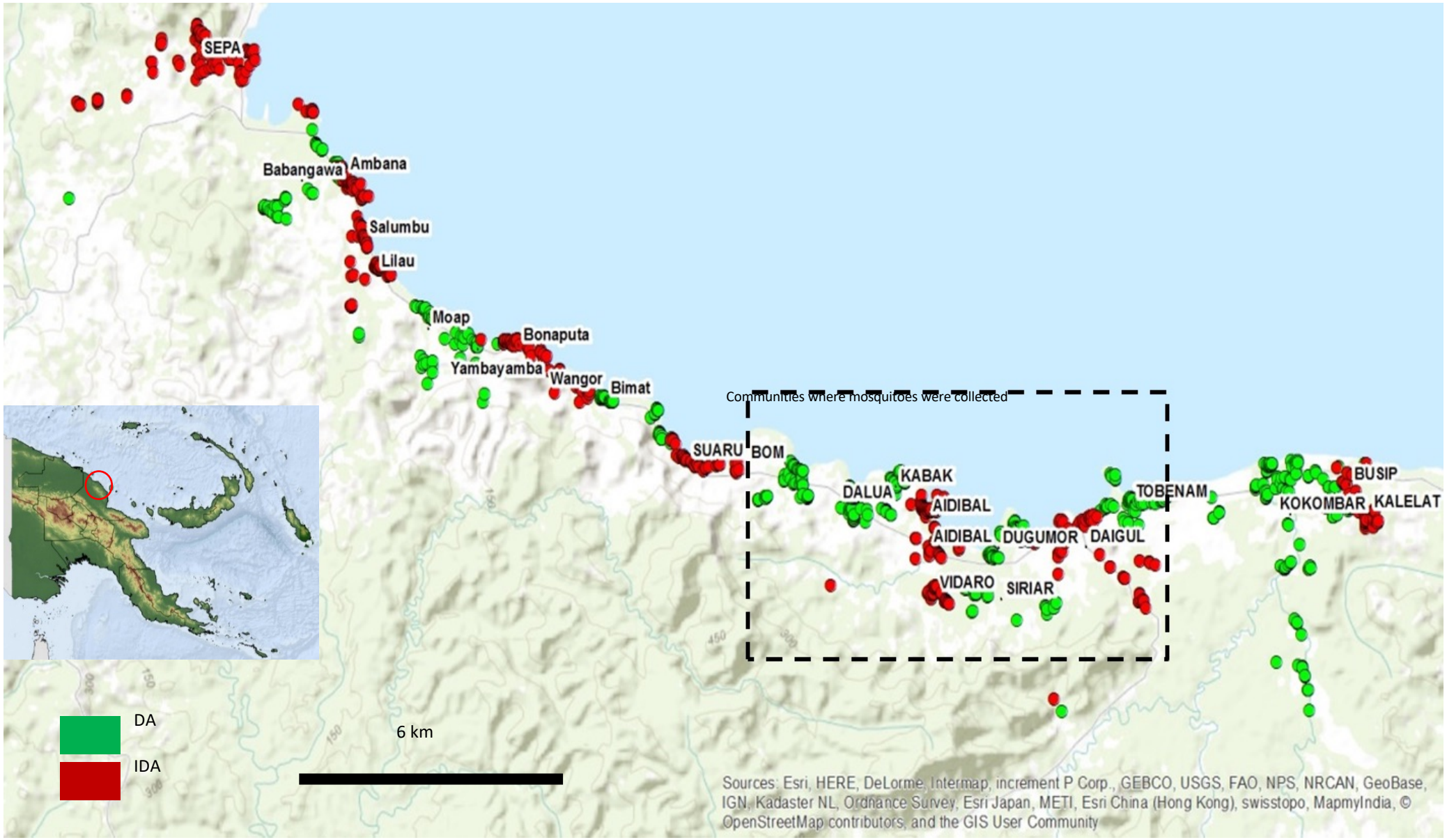
Mectizan Donation Program - Merck.com

https://www.merck.com › about › featured-stories › mectizan

In November 2017, in support of new WHO guidelines, **Merck** announced an expansion of the MECTIZAN® **Donation** Program (MDP) to reach up to an additional 100 million people per year through 2025 as part of the global effort to **eliminate lymphatic filariasis** (**LF**).

World Health Organization

Trial site – 24 villages in Bogia District, Madang



Lancet Infect Dis. 2022 May

Mass drug administration of ivermectin, diethylcarbamazine, plus albendazole compared with diethylcarbamazine plus albendazole for reduction of lymphatic filariasis endemicity in Papua New Guinea: a cluster-randomised trial

Moses Laman, Livingstone Tavul, Stephan Karl, Bethuel Kotty, Zebede Kerry, Stephen Kumai, Anna Samuel, Lina Lorry, Lincoln Timinao,

Interpretation Mass administration of the triple-drug regimen was more effective than the two-drug regimen in reducing microfilariae prevalence in communities to less than the target level of 1%, but did not reduce circulating filarial antigen prevalence to less than 2%. These results support the use of mass drug administration with the triple-drug regimen to accelerate elimination of lymphatic filariasis.

effectiveness of mass drug administration with the triple-drug and two-drug regimens for reducing microfilariae prevalence to less than 1% and circulating filarial antigen prevalence to less than 2%, levels that are unlikely to sustain transmission of lymphatic filariasis, in Papua New Guinea.

See Online/Comment
https://doi.org/10.1016/S1473-3099(22)00063-9

Clinical research interest by practising clinicians

Transactions of the Royal Society of Tropical Medicine and Hygiene Advance Access published May 3, 2014

Trans R Soc Trop Med Hyg
doi:10.1093/trstmh/tru067

ORIGINAL ARTICLE

Accuracy of initial clinical diagnosis of acute bacterial meningitis in children from a malaria-endemic area of Papua New Guinea

Jimmy Aipit[a], Moses Laman[b,c,*], Ilomo Hwaiwhanje[a], Cathy Bona[b], Naomi Pomat[a], Peter Siba[b], Timothy M. E. Davis[c] and Laurens Manning[c]

[a]Modilon General Hospital, Paediatrics Unit, Madang, Papua New Guinea; [b]Papua New Guinea Institute of Medical Research, Madang, Papua New Guinea; [c]School of Medicine and Pharmacology, University of Western Australia, Fremantle Hospital, Fremantle, Western Australia, Australia

Journal of Tropical Pediatrics, 2016, 62, 282–287
doi: 10.1093/tropej/fmw001
Advance Access Publication Date: 15 February 2016
Original paper

OXFORD

The Burden of Child Maltreatment Leading to Hospitalization in a Provincial Setting in Papua New Guinea

by Allanie Rero,[1] Jimmy Aipit,[1] Tina Yarong-Kote,[1] Villa Watch,[1] John W. Bolnga,[2] Robert Vei,[2] Marilyn Morris,[2] Elvin Lufele,[3] and Moses Laman[1,3]

PNG Med J 2012 Mar-Dec;55(1-4):5-11

Bloodstream infections caused by resistant bacteria in surgical patients admitted to Modilon Hospital, Madang

HENAO ASA[1], MOSES LAMAN[2,3], ANDREW R. GREENHILL[2], PETER M. SIBA[2], TIMOTHY M.E. DAVIS[3], JOHN MAIHUA[1] AND LAURENS MANNING[3,4]

Modilon General Hospital, Madang, Papua New Guinea, Papua New Guinea Institute of Medical Research, Madang and School of Medicine and Pharmacology, University of Western Australia, Fremantle Hospital, Australia

Int Health 2017; **9**: 374–378
doi:10.1093/inthealth/ihx043 Advance Access publication 8 December 2017

ORIGINAL ARTICLE

The burden of presumed tuberculosis in hospitalized children in a resource-limited setting in Papua New Guinea: a prospective observational study

Villa Watch[a], Jimmy Aipit[a], Tina Kote-Yarong[a], Allanie Rero[a], John W. Bolnga[b], Elvin Lufele[c] and Moses Laman[a,c,*]

[a]Modilon General Hospital, Department of Paediatrics, Madang Province; [b]Modilon General Hospital, Department of Obstetrics and Gynaecology, Madang Province; [c]Papua New Guinea Institute of Medical Research, Madang Province, Papua New Guinea

Am. J. Trop. Med. Hyg., 92(1), 2015, pp. 72–74
doi:10.4269/ajtmh.14-0373

Short Report: Prevalence of Patients with Acute Febrile Illnesses and Positive Dengue NS1 Tests in a Tertiary Hospital in Papua New Guinea

Viola Asigau, Evelyn K. Lavu, William J. H. McBride, Eric Biloh, Francis Naroi, Egi Koana, John K. Ferguson, and Moses Laman*

Pathology Laboratory, Port Moresby General Hospital, Port Moresby, Papua New Guinea; School of Medicine and Health Sciences, University of Papua New Guinea, Port Moresby, Papua New Guinea; Central Public Health Laboratory, Port Moresby General Hospital, Port Moresby, Papua New Guinea; James Cook University, School of Medicine and Dentistry, Cairns Base Hospital, Cairns, Australia; John Hunter Hospital, New Castle, New South Wales, Australia; Papua New Guinea Institute of Medical Research, Madang, Papua New Guinea

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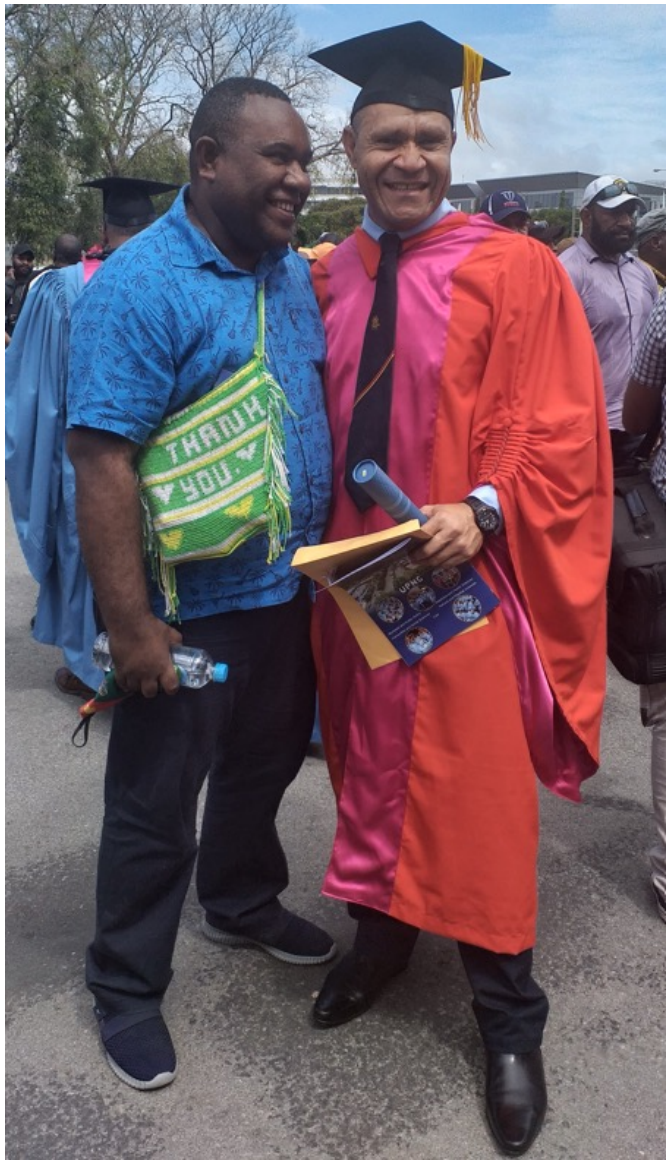
PHARMACOLOGY

Validation of a Dried Blood Spot Ceftriaxone Assay in Papua New Guinean Children with Severe Bacterial Infections

Mispah Mukap,[a,b] Corin Sprod,[a,b] Nakapi Tefuarani,[a] Moses Laman,[b] Madhu Page-Sharp,[c] Sam Salman,[e] Brioni R. Moore,[c,f] Kevin T. Batty,[c] Timothy M. E. Davis,[d,e] Laurens Manning[f]



John's papers

- The impact of tubal ectopic pregnancy in Papua New Guinea--a retrospective case review. Hamura NN, Bolnga JW, Wangnapi R, Horne AW, Rogerson SJ, Unger HW. BMC Pregnancy Childbirth. 2013 Apr 4;13:86. doi: 10.1186/1471-2393-13-86.
- Insights into maternal mortality in Madang Province, Papua New Guinea. Bolnga JW, Hamura NN, Umbers AJ, Rogerson SJ, Unger HW. Int J Gynaecol Obstet. 2014 Feb;124(2):123-7. doi: 10.1016/j.ijgo.2013.08.012. Epub 2013 Nov 6.
- Maternal and perinatal mortality in resource-limited settings. Bolnga JW, Morris M, Aipit J, Laman M. Lancet Glob Health. 2015 Nov;3(11):e672.
- Maternal near-misses at a provincial hospital in Papua New Guinea: A prospective observational study. Bolnga JW, Morris M, Totona C, Laman M. Aust N Z J Obstet Gynaecol. 2017 Dec;57(6):624-629.
- Safety and effectiveness of oral misoprostol for induction of labour in a resource-limited setting: a dose escalation study. Morris M, Bolnga JW, Verave O, Aipit J, Rero A, Laman M. BMC Pregnancy Childbirth. 2017 Sep 8;17(1):298.
- Incidence of self-induced abortion with misoprostol, admitted to a provincial hospital in Papua New Guinea: A prospective observational study. Bolnga JW, Lufele E, Teno M, Agua V, Ao P, Dl Mola G, Pomat W, Laman M. Aust N Z J Obstet Gynaecol. 2021 Dec;61(6):955-960.
- Mortality and morbidity after emergency peripartum hysterectomy in a provincial referral hospital in Papua New Guinea: A seven-year audit. Bolnga JW, Mola GDL, Ao P, Sapau W, Verave O, Lufele E, Laman M. Aust N Z J Obstet Gynaecol. 2021 Jun;61(3):360-365.
- Safety and efficacy of an oral misoprostol standard-dose regimen vs a low-dose regimen for induction of labour in Papua New Guinean women: An open-label randomised controlled trial. Bolnga JW, Mola GDL, Totona C, Ao P, Lufele E, Laman M. Aust N Z J Obstet Gynaecol. 2021 Aug;61(4):554-562.

Concluding remarks

- Local researchers have a vital role in conducting research that is locally relevant
- Research has a potential to not only improve health and enable evidence-driven policy but also i) create employment ii) build HR capacity for the country iii) build infrastructure iv) create a conducive research environment v) enable collaboration
- Using the partnership-based approach that resonates with our Melanesian culture, a lot can be attached in the region
- The time is right for regional champions to lead locally impactful research – for instance funding bodies
- We can conduct strategic and impactful research and create opportunities for our people in the region
- Encourage regional collaboration

Acknowledgements

STRIVE PNG
STRONGER SURVEILLANCE FOR VECTOR BORNE PATHOGENS

PAPUA NEW GUINEA
DEPARTMENT OF HEALTH

Yumi Rausim Malaria
PNG NATIONAL MALARIA CONTROL PROGRAM

PNGIMR
Save Tambuim Sik
PAPUA NEW GUINEA INSTITUTE OF MEDICAL RESEARCH

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ROTARY AGAINST MALARIA

NATNAT
Newly Adapted Tools Network Against mosquito borne disease Transmission
PAPUA NEW GUINEA

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