



## Kalisvar Marimuthu

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### Research Interests:

- Transmission dynamics of multidrug-resistant organisms and emerging pathogens
- Applied genomics in infection prevention and control (IPC) and outbreak investigations
- Cohort studies of multidrug-resistant organisms (MDRO)
- IPC implementation research

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## Biography

Dr Kalisvar Marimuthu completed his advanced specialty training in Internal Medicine and Infectious Diseases in Singapore in 2010 and 2013 respectively. Subsequently, Dr Marimuthu trained in infection prevention and control as a Senior Research Fellow in the Infection Prevention and Control Unit of Geneva University Hospital.

Dr Marimuthu is currently a senior consultant in infectious diseases at Tan Tock Seng Hospital (TTSH) and the head of the Infection Prevention, Control and Outreach (ICON) office at NCID. He is the chair of the National Infection Prevention and Control Committee (NIPC) of Singapore. He is also a consultant in the technical advisory committee for the World Health Organisation (WHO)'s carbapenem-resistant Enterobacteriaceae (CRE) guideline and healthcare-associated Infections (HAI) surveillance guideline. He is also a member of the WHO health emergency program ad-hoc IPC advisory panel (WHE-IPC-AP) for COVID-19.

Dr Marimuthu is active in the research related to pandemic preparedness, transmission dynamics of pathogens, healthcare-associated infections, and applied genomics in IPC.

## Selected Publications

- Cai Y, Venkatachalam I, Tee NW, Tan TY, Kurup A, Wong SY, Low CY, Wang Y, Lee W, Liew YX, Ang B, Lye DC, Chow A, Ling ML, Oh HM, Cuvin CA, Ooi ST, Pada SK, Lim CH, Tan JWC, Chew KL, Nguyen VH, Fisher DA, Goossens H, Kwa AL, Tambyah PA, Hsu LY, Marimuthu K. Prevalence of Healthcare-Associated Infections and Antimicrobial Use Among Adult Inpatients in Singapore Acute-Care Hospitals: Results From the First National Point Prevalence Survey. *Clin Infect Dis*. 2017 May 15;64(suppl\_2):S61-S67. doi: 10.1093/cid/cix103.  
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- Marimuthu K, Venkatachalam I, Khong WX, Koh TH, Cherng BPZ, Van La M, De PP, Krishnan PU, Tan TY, Choon RFK, Pada SK, Lam CW, Ooi ST, Deepak RN, Smitasin N, Tan EL, Lee JJ, Kurup A, Young B, Sim NTW, Thoon KC, Fisher D, Ling ML, Peng BAS, Teo YY, Hsu LY, Lin RTP, Ong RT, Teo J, Ng OT; Carbapenemase-Producing Enterobacteriaceae in Singapore (CaPES) Study Group. Clinical and Molecular Epidemiology of Carbapenem-Resistant Enterobacteriaceae Among Adult Inpatients in Singapore. *Clin Infect Dis*. 2017 May 15;64(suppl\_2):S68-S75. doi: 10.1093/cid/cix113  
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- Stewardson AJ, Marimuthu K, Sengupta S, Allignol A, El-Bouseary M, Carvalho MJ, Hassan B, Delgado-Ramirez MA, Arora A, Bagga R, Owusu-Ofori AK, Ovosi JO, Aliyu S, Saad H, Kanj SS, Khanal B, Bhattarai B, Saha SK, Uddin J, Barman P, Sharma L, El-Banna T, Zahra R, Saleemi MA, Kaur A, Iregbu K, Uwaezuoke NS, Abi Hanna P, Feghali R, Correa AL, Munera MI, Le TAT, Tran TTN, Phukan C, Phukan C, Valderrama-Beltrán SL, Alvarez-Moreno C, Walsh TR, Harbarth S. Effect of carbapenem resistance on outcomes of bloodstream infection caused by Enterobacteriaceae in low-income and middle-income countries (PANORAMA): a multinational prospective cohort study. *Lancet Infect Dis*. 2019 Jun;19(6):601-610. doi: 10.1016/S1473-3099(18)30792-8. Epub 2019 Apr 29.  
[https://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(18\)30792-8/abstract](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(18)30792-8/abstract)
- Ng OT, Marimuthu K, Chia PY, Koh V, Chiew CJ, De Wang L, Young BE, Chan M, Vasoo S, Ling LM, Lye DC, Kam KQ, Thoon KC, Kurupatham L, Said Z, Goh E, Low C, Lim SK, Raj P, Oh O, Koh VTJ, Poh C, Mak TM, Cui L, Cook AR, Lin RTP, Leo YS, Lee VJM. SARS-CoV-2 Infection among Travelers Returning from Wuhan, China. *N Engl J Med*. 2020 Apr 9;382(15):1476-1478. doi: 10.1056/NEJMc2003100. Epub 2020 Mar 12. PMID: 32163698; PMCID: PMC7121487.  
<https://www.nejm.org/doi/full/10.1056/NEJMc2003100>
- Ong SWX, Tan YK, Chia PY, Lee TH, Ng OT, Wong MSY, Marimuthu K. Air, Surface Environmental, and Personal Protective Equipment Contamination by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) From a Symptomatic Patient. *JAMA*. 2020 Apr 28;323(16):1610-1612. doi: 10.1001/jama.2020.3227. PMID: 32129805; PMCID: PMC7057172.  
<https://jamanetwork.com/journals/jama/fullarticle/10.1001/jama.2020.3227>
- Chng KR, Li C, Bertrand D, Ng AHQ, Kwah JS, Low HM, Tong C, Natrajan M, Zhang MH, Xu L, Ko KKK, Ho EXP, Av-Shalom TV, Teo JWP, Khor CC; MetaSUB Consortium; Chen SL, Mason CE, Ng OT, Marimuthu K, Ang B, Nagarajan N. Cartography of opportunistic pathogens and antibiotic resistance genes in a tertiary hospital environment. *Nat Med*. 2020 Jun;26(6):941-951. doi: 10.1038/s41591-020-0894-4. Epub 2020 Jun 8. PMID: 32514171; PMCID: PMC7303012.  
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- Marimuthu K, Mo Y, Ling ML, Hernandez-Koutoucheva A, Fenlon SN, Bertrand D, Lye DC, Ang BSP, Perencevich E, Ng OT, Cooper BS, Nagarajan N, Chen SL, Barkham T. Household transmission of carbapenemase-producing Enterobacteriaceae: a prospective cohort study. *J Antimicrob Chemother*. 2021 Apr 13;76(5):1299-1302. doi: 10.1093/jac/dkaa561.  
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- Wang M, Earley M, Chen L, Hanson BM, Yu Y, Liu Z, Salcedo S, Cober E, Li L, Kanj SS, Gao H, Munita JM, Ordoñez K, Weston G, Satlin MJ, Valderrama-Beltrán SL, Marimuthu K, Stryjewski ME, Komarow L, Luterbach C, Marshall SH, Rudin SD, Manca C, Paterson DL, Reyes J, Villegas MV, Evans S, Hill C, Arias R, Baum K, Fries BC, Doi Y, Patel R, Kreiswirth BN, Bonomo RA, Chambers HF, Fowler VG Jr, Arias CA, van Duin D; Multi-Drug Resistant Organism Network Investigators. Clinical outcomes and bacterial characteristics of carbapenem-resistant *Klebsiella pneumoniae* complex among patients from different global regions (CRACKLE-2): a prospective, multicentre, cohort study. *Lancet Infect Dis*. 2022 Mar;22(3):401-412. doi: 10.1016/S1473-3099(21)00399-6.  
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- Chua JY, Lim ZQ, Loy SQD, Koh V, Thevasagayam NM, Huan X, Linn KZ, Marimuthu K, Ng OT. Evaluation of the Xpert Carba-R assay for quantifying carbapenemase-producing bacterial load in stool samples. *PLoS One*. 2024 Aug 28;19(8):e0309089. doi: 10.1371/journal.pone.0309089. eCollection 2024.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11356397>
- Tan TY, Li J, Eng LC, Leong YY, An R, Abu Bakar FB, Thevasagayam NM, Loy DSQ, Rama Sridatta PS, Chua JJY, Marimuthu K, Ng OT. Persistence of plasmid-borne carbapenemase genes in environmental Gram-negative bacilli plays a role in hospital acquisition of carbapenemase-producing organisms. *J Hosp Infect*. 2024 Sep 13:S0195-6701(24)00297-4. doi: 10.1016/j.jhin.2024.09.003. Epub ahead of print.  
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#### Notable Research Awards & Grants from Past 5 Years

Name of Awards & Grants	Year Obtained
<b>NMRC Clinician Scientist-Individual Research Grant (CS-IRG)</b> Household Transmission of Carbapenemase-producing Enterobacteriaceae Singapore: A Cohort Study	2019
<b>NHG-NCID COVID 19 Centre Grant</b> Evaluation of airborne and fomite transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in healthcare settings	2020
<b>Clinician Scientist / Clinician Investigator Salary Support Programme (CS/CISSP)</b> Oral capsule-administered faecal microbiota transplantation for intestinal carbapenemase-producing Enterobacteriaceae decolonization	2020
<b>Clinician Scientist / Clinician Investigator Salary Support Programme (CS/CISSP)</b> Household transmission of carbapenemase-producing Enterobacteriaceae Singapore: A cohort study	2020
<b>NHG-NCID COVID 19 Centre Grant</b> Assessing the impact of the COVID-19 pandemic on nosocomial transmission of Carbapenem-resistant organisms (CRO) using integrated whole genome sequencing (WGS), clinical epidemiology, and environmental surveillance	2020
<b>Programme for Research in Epidemic Preparedness and Response (PREPARE): Commissioned Study</b> Preparedness program for air and environmental sampling for future outbreak from emerging or novel pathogens	2023

## Translating Research Into Healthcare

2023:

- [Behind The Mask: Our Healthcare Story] Masking up as a best practice. Published on 15 May 2023. <https://www.channelnewsasia.com/brandstudio/behindthemask#tile-1-5>

2022:

- NCID's support for nursing homes transit to Care@NH. Published in June. \*No url
- Hidden reservoirs contribute to plasmid-mediated transmission with Dr Kalisvar Marimuthu. Published on 27 Jul 2022. <https://podcasts.apple.com/sg/podcast/hidden-reservoirs-contribute-to-plasmid-mediated-transmission/id1560741724?i=1000571298098>

2021:

- MCI COVID-19 Vaccination Campaign. Published from 11 Feb to 27 Feb 2021. <https://mediacorp-sg.sharefile.com/d/s458915b9819d45569f7e3cc8374d52f0>
- Singapore's COVID-19 vaccines. Published on 17 Feb 2021. <https://www.mewatch.sg/watch/Ethioli-S17-E45-199618>
- Everyone over the age of 16 in Singapore should be vaccinated against COVID-19. Published on 17 Feb 2021. <http://article.isentia.asia/stream/nelmisreportview.aspx?file=20210217-r-968RE-NEWS-190900-Everyone+over+the+age.mp3&cc=SG&headline=Everyone+over+the+age+of+16+in+Singapore+is+required+to+be+vaccinated+against+COVID-19>
- Expert Explainer Series on Vaccination by MCI for gov.sg (Tamil). Published on 08 Mar 2021. Video 1: <https://www.youtube.com/watch?v=7rx8SZ1sjw8>  
Video 2: <https://www.youtube.com/watch?v=hhge0UX1gSI>
- COVID-19 Vaccination. Published from 14 to 30 Apr 2021.
  - <https://mediacorp-sg.sharefile.com/d/s3049431d46b143b0b1b18872d6608205>
  - <https://mediacorp-sg.sharefile.com/d/s49599997382940fe83dc27ef16cd231d>
- Happy Kopitiam FB Live (Tamil session). Published on 25 Apr 2020. <https://www.facebook.com/OurHappyKopitiam/videos/792511725024932/>

Health Impact (CY2022 publications)

- 1) Analysis of COVID-19 Incidence and Severity Among Adults Vaccinated With 2-Dose mRNA COVID-19 or Inactivated SARS-CoV-2 Vaccines With and Without Boosters in Singapore
  - a) Paper was cited by the **The Federal Office of Public Health (Bundesamt für Gesundheit)** as part of Annex 4 submitted to **Government of Switzerland** on the analysis of the Efficacy of the vaccines.

The Federal Office of Public Health (FOPH) is the Swiss federal government's centre for public health and a part of the Swiss Federal Department of Home Affairs. In addition to developing national health policy, it also represents the interests of its country within international health organizations such as the OECD or the World Health Organization.

Policy citation link (Plum X Metrix):

[https://plu.mx/plum/a/policy\\_citation?doi=10.1001/jamanetworkopen.2022.28900](https://plu.mx/plum/a/policy_citation?doi=10.1001/jamanetworkopen.2022.28900)

2) Transmission modes of severe acute respiratory syndrome coronavirus 2 and implications on infection control: a review

- a) The paper was cited by Sax Institute as part of the evidence snapshot and was commissioned by the Australian Commission on Safety and Quality in Health Care as part of the information to better protect healthcare workers during the SARS-CoV-2 virus.

Sax Institute: The Sax Institute is an independent, not-for-profit organisation that improves health and wellbeing by driving better use of evidence in policies, programs and services. A Evidence Specialist team working collaboratively to embed research into the fabric of policy, program and service delivery decisions. The team develop, test and deliver best-practice approaches to working at the interface of research and health decision-making.

Policy citation link (Plum X Metrix):

[https://plu.mx/plum/a/policy\\_citation?doi=10.11622/smedj.2020114](https://plu.mx/plum/a/policy_citation?doi=10.11622/smedj.2020114)