









Malaria Scientist to Watch An interview with Dr Arun K. Sharma Director, ICMR-NIIRNCD, Jodhpur



Upcoming Event Distinguished Lecture by Dr Ashwani Kumar Director, ICMR-VCRC, Pudducherry



MERA-India brings you... NEWS & VIEWS ISSUE 20, JUNE 2022

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## **Editorial**

Dear Readers,

MERA-India team brings you the twentieth issue of our newsletter.

Every year, June 05<sup>th</sup> is marked as World Environment Day globally to spread awareness on environment related issues like climate change, wildlife, pollution and ways to protect our planet. Without appropriate measures being taken, the continuous exposure to hazardous pollution and drastic climate changes, not only have a profound effect on the physical wellbeing of society but also have a significant impact on an individual's mental health. The changes in environmental conditions have discouraging effects on mankind, posing more significant risk of vector-borne diseases like malaria. Increased flooding and erratic rainfall may lead to standing water areas, providing breeding sites for mosquitoes. As environmental changes in environment unfold, there may be more concerns about expanding habitats of malaria parasite infected mosquitoes. It is feared that the changing environmental conditions will eventually increase the geographical dissemination of malaria which may have an awful effect on the malaria burden in the endemic areas.

We at MERA-India understand the emerging threats to ongoing progress and acclimate to the fight against malaria. The MERA-India aimed to promote innovative ideas to motivate research activities for malaria elimination and control.

June has been observed as 'Anti-Malaria month' in all states of our country before the onset of the transmission period to spread awareness for mosquito-borne diseases like malaria. The NIMR, Field Unit-Goa organized a campaign in Goa to spread awareness about vector-borne diseases. More details about this campaign are provided in the current issue.

In the last lecture of the Lecture Series on Infectious Diseases, jointly organized by MERA-India and ICMR-NIMR, it was a delight listening to the inspirational talk by Dr Manju Rahi, Scientist 'F' at the Division of Epidemiology and Communicable Diseases, ICMR Headquarters, Delhi. Her talk gave insights into the existing antimalarial strategies, current challenges and the solutions to achieve the goal of malaria elimination in India by 2030. The summary of the lecture is provided with this issue.

The twentieth issue of the MERA-India newsletter brings to you rejoicing, motivating interview by eminent scientist Dr Arun K. Sharma (Director, ICMR-NIIRNCD Jodhpur) in the 'Malaria Scientists to Watch' section. Read the latest research updates on developing new antimalarial therapeutic interventions, diagnostics and vector behaviour in the 'Research in Spotlight' section.

Under the "Resource for Malaria Researchers" section, we have highlighted the MESA Track, a freely available online database encompassing details of research projects related to malaria elimination. In our "A Child's Perception of Malaria" section, again we will mesmerize you with the naive yet informative thoughts of a child in the form of sketch demonstrating her understanding of malaria disease.

In the "Upcoming event" section, we have highlighted the Distinguished Lecture by Dr Ashwani Kumar, Director ICMR-VCRC, to be held next month. In the "Announcements" section, we have highlighted the open call for BMJ Global Health Grant 2022 and the call for papers by Infectious Diseases of Poverty journal on a special thematic series on malaria.

We hope that this issue will be more exciting and enjoyable for you. Please write to us for any feedback or suggestions regarding the newsletter's content at <u>meranewsletter@gmail.com</u>.

With best wishes, MERA-India team

### **ICMR-NIMR & MERA-India Activities**

#### Malaria Awareness Campaign



The NIMR, Field Unit - Goa in association with the Lions Club of Vasco-da-Gama organised an awareness campaign program on the prevention and control of malaria and other vectorborne diseases on 08<sup>th</sup> & 14<sup>th</sup> May 2022 in the Housing Board Colony, New Vaddem, and Baina Beach, in Vasco city, Goa. The purpose of organizing this programme before the monsoon season was to spread awareness among the local people about mosquito-borne diseases. The awareness program was carried out under the guidance of Dr Ajeet Mohanty, Officer-in-Charge of NIMR, Field Unit - Goa. The young research scholars, trained technical and MERA-India project staff actively participated in the awareness program.

The program's primary purpose was to educate people, of all age groups including children and senior citizens, about vector-borne diseases and how to prevent or control the breeding of mosquitoes inside and outside their premises. The team exhibited various models and posters explaining the mosquito breeding, resting and feeding behaviour. The immature stages of mosquito species such as *Anopheles stephensi* (malaria vector), *Culex quinquefasciatus* (filariasis vector), and *Aedes aegypti* (dengue & chikungunya vector) were shown. Common mosquito breeding sites were demonstrated and how to do the source reduction was also explained. A live demonstration of guppy fish (*Poecilia reticulata*), an excellent tool for the biological control of mosquito larvae, was also demonstrated by the technical staff of NIMR, Field Unit - Goa.

The control strategies for vector-borne diseases like Malaria, Dengue, Chikungunya, Zika and Japanese encephalitis and the importance of using Long-Lasting Insecticidal Nets (LLINs), and how one can protect themselves from infectious mosquito bites were also explained in detail by Dr Ajeet Mohanty, Officer-in-Charge of the Field Unit, Goa.



The twelfth and concluding lecture in the ICMR-NIMR & MERA-India "Lecture Series on Infectious Diseases" was delivered by Dr Manju Rahi, Scientist-'F' and Deputy Director General (SG) at the Division of Epidemiology and Communicable Diseases, ICMR Headquarters, Delhi. She delivered the lecture entitled "Strategies/tools to maintain the momentum of malaria elimination in India". Dr Sachin Sharma, Chief Consultant MERA-India, welcomed everyone and introduced Dr Rahi.

In the lecture, Dr Rahi talked about India's journey toward malaria elimination. She stated that while there has been a decline in the number of malaria cases in India, the requirement is to maintain the momentum in this decline to attain the target of eliminating malaria by 2030. It is thus required to identify and overcome the barriers in this direction. Dr Rahi narrated the history of malaria in India, drug policy changes over the decades and the significant milestones

to-date. She highlighted that historically malaria was called as "King of diseases" in India and led to heavy economic losses. Nonetheless, with the profuse use of DDT for vector control, in the year 1961, the lowest number of malaria cases were recorded in the history of India. However, this also led to complacency and diversion of attention and resources away from malaria leading to a resurgence in 1976. She further talked about the current malaria situation in India and the malaria control and surveillance strategies, as described in the National Strategic Plan by NCVBDC, based on the API levels. She further told the possible challenges to achieve malaria elimination such as inadequate and paper-based surveillance; incomplete *Plasmodium vivax* infection resolution; limitations and availability of the current diagnostics; drug resistance; vector bionomics and control; and limited cross-talk between the multistakeholders. She next presented the proposed solutions for all the challenges described. Dr Rahi concluded the lecture by briefly describing MERA-India's journey since its inception and the initiatives MERA-India took to support India's malaria elimination programme and spread awareness about malaria.

The lecture was followed by answers to the questions from attendees. Dr Sachin Sharma thanked the speaker and all the attendees for their interest and participation throughout the series.

The recordings of this lecture, and all the previous lectures in the lecture series are available on the MERA-India website (<u>https://www.meraindia.org.in/lecture-series</u>).

We will soon announce the twelve speakers for the next lecture series on infectious diseases.

### **Research in Spotlight**

Sangbakembi-Ngounou C *et al., PNAS,* 2022: Diurnal biting of malaria mosquitoes in the Central African Republic indicates residual transmission may be "out of control"



Protection against mosquito bites, using insecticide-treated nets or mosquito repellents or indoor residual sprays in houses, is crucial for protecting against mosquito-borne diseases like malaria. It has been largely assumed that mosquitoes bite during the night time, and thus the transmission studies overlook the mosquito bites during the other times of the day. In this study, the authors looked into mosquito biting for 48 hours every month, for over one year in four sites around Bangui, the Central African Republic, including indoors and outdoors. The mosquitoes were captured when they landed for biting and tested for the presence of malaria parasites. A total of 7,982 Anopheles mosquitoes (eight different species: A. gambiae, A. coluzzii, A. funestus, A. pharoensis, A. nili, A. gambiae x coluzzii hybrids, A. ziemanni and A. moucheti) were collected. While most mosquito-biting events were between dusk and dawn, the researchers found that approximately 20-30% of the mosquito bites occurred indoors during the daytime. Also, each mosquito species had two distinct populations, the day-biting and the night-biting population, however, the percentage of mosquitoes infected with the malaria parasites was the same in both the mosquito populations. The study thus brings to focus the need to extend the adoption of strategies against mosquito bites to the daytime as well, to address the residual malaria transmission not targeted by the conventional mosquito control interventions.

# González-Silva M and Rabinovich N.R., Malar J., 2021: Some lessons for malaria from the Global Polio Eradication Initiative

González-Silva and Rabinovich Malar J (2021) 20:210
Malaria Journal

REVIEW
Open Access

Some lessons for malaria from the Global
Image: Constant of the constan

In this <u>article</u>, the authors have described the learnings from the Global Polio Eradication Initiative (GPEI) that can be adopted by the Global Malaria Eradication Programme (GMEP). The authors highlight that while GPEI was launched in 1988 with a target to completely eradicate polio by 2000, two countries reported polio in 2019, and challenges such as insufficient vaccination and the reversion of vaccine-attenuated polio virus have emerged. The authors note that while malaria and polio are very different in terms of the epidemiology and the infection characteristics as well as the interventions to contain them, and some of the challenges are unique to each of these diseases, the operational, implementation, decisionmaking, surveillance, funding, research, need for innovative tools and interventions, community involvement aspects and preparedness for unexpected/unforeseen roadblocks especially in the field can be strengthened in malaria eradication drive using the experience from GPEI. The understanding from the 32 years since the GPEI launch, thus can boost the efforts toward malaria eradication and help in achieving the targets set up by the Global Technical Strategy against Malaria (2016-2030). Xie SC *et al.,* Science, 2022: Reaction hijacking of tyrosine tRNA synthetase as a new whole-of-life-cycle antimalarial strategy



Increasing resistance to existing antimalarial therapy urges the need for new treatments targeting novel modes of action in the malaria parasite. Aminoacyl transfer RNA synthetases (aaRSs) are crucial enzymes for eukaryotic protein synthesis and have been attractive drug targets for infectious diseases. These enzymes catalyze the conversion of amino acids into AMP conjugates followed by the formation of aminoacyl-tRNAs for protein synthesis.

In the present <u>study</u>, the authors used adenosine 5'- sulfamate (AMS), which is a mimetic of adenosine 5'-monophosphate (AMP) as a tool and identified class I and class II aaRSs catalyzed the reaction that leads to the formation of an inhibitory amino acid–sulfamate conjugate through a mechanism of reaction-hijacking. The authors found that adenosine 5'-sulfamate has broad specificity and hijacks a range of aaRSs. They looked for aaRS-targeting nucleoside sulfamates with narrower specificity and screened a library of sulfamates compounds and identified pyrazolopyrimidine sulfamates with a 7-position substituent like ML901 possessing efficient activity against *P. falciparum* with IC<sub>50</sub> value close to that of DHA. ML901 was found to be highly selective for *P. falciparum* strains and inhibited sexual stages (male gametes) of Plasmodium as well as the development of the parasite in human hepatocytes. *In vivo* antimalarial efficacy studies of ML901 in the malaria mouse model showed a long half-life and a single-dose efficacy of the compound. Target identification studies validated *P. falciparum* tyrosine tRNA synthetase (PfYRS) as the target of ML901 in the parasite. Mechanistically, ML901 inhibits protein translation in *P. falciparum* by inhibiting

ATP consumption and preventing tRNA<sup>Tyr</sup> acylation to tyrosine by PfYRS. Furthermore, X-ray crystallographic studies on the malaria parasite and human YRSs revealed that there is differential flexibility of a loop over the catalytic site that supports different susceptibility to reaction hijacking by ML901. In conclusion, the authors showed that ML901 specifically inhibits PfYRS which could be fatal for transmissible stages of *P. falciparum*. The authors' findings indicated that the hijacking of Class I and Class II tRNA aaRSs by nucleoside sulfamates could open new avenues for designing small molecular weight inhibitors targeting these enzymes.





In this <u>article</u>, the authors identified new biomarker candidates for malaria, which can be used in developing of a novel rapid diagnostic test kit (RDT) that can be availed in endemic areas with prevailing hrp2/hrp3 deletion cases. The authors employed a two-way approach. First, they did a systematic review of malaria diagnostic markers, comprehensively examining and identifying promising candidates antigens followed by *in silico* analysis of the *P. falciparum* proteomics database. The systematic analysis led to the identification of four different groups of biomarkers comprising 98 biomarker candidates, of which only 5 biomarkers of parasite origin were proteins. Next, *in silico* analysis of available *P. falciparum* proteomics data was carried out to validate the diagnostic value of candidates identified by the systematic review studies. Using combinatorial approaches, they could identify only two parasite proteins – GAPDH and DHFR-TS with favourable diagnostic features and predicted diagnostic values. This study identified new antigens for developing next-generation malaria RDTs.

### Malaria Scientist to Watch An interview with Dr Arun K. Sharma



Dr Arun K. Sharma

Director, ICMR-NIIRNCD, Jodhpur, India

# 1. Please share with our readers your journey from being a young scientist to your current role as the Director of ICMR-NIIRNCD.

I did my MBBS at Nil Ratan Sircar Medical College in Kolkata, and just like all medical aspirants, I was also interested in being a clinician at some stage of my life. But when I read the textbook "Preventive & Social Medicine (PSM)" by Park, and attended the classes, I started developing an interest in PSM from those undergraduate days itself. I aspired to become a haematologist. But, then fate had something else in store for me and eventually I landed up in the MD programme in Community Medicine at the Institute of Medical Sciences (IMS), Banaras Hindu University (BHU). After that, there was no looking back because the department was very good and I got an opportunity to learn Community Medicine in a very basic sense because of the kind of teachers I got there. And, I would like to mention that Professor D.C.S. Reddy, Professor I.C. Tiwari and Professor Jhanvi Tandon were the people who were the faculty in the department at that time. They were not only very good academically, but at the same time they were very caring people and they mentored me very well. So, gradually I developed an interest in the subject and at the end of the second year, I decided to continue my profession as a Community Medicine person.

And then within a year, I got my first appointment as a Lecturer at the University College of Medical Sciences in Delhi. From the very beginning, I was enthusiastic about conducting research. So, I did my first research on HIV, when HIV infection was more of a stigma, there was hardly anything much known about the disease and there was no cure. And, at that time I got an opportunity to do research on the prevalence of HIV among IV drug users in South Delhi. And, being in a medical college at that time, the funds for research were not easily available. Our college was situated in Shahadra, and our health centre was located in Mehrauli, so that was like crossing the whole city of Delhi. And, I remember, I used to go on a motorcycle with my sociologist as my pillion rider. And we carried the kits for blood sample collection, from Shahadra to Mehrauli, on the motorcycle, and come back and get them tested

in my college. And that research was done without any funding from any source. So, what I am trying to say is that my passion for research did manifest in that, and the paper that I wrote about this research allowed me to get a scholarship to attend the International AIIDS Conference in Vancouver, Canada, and, I presented my first research paper there. So, that became a huge inspiration and motivation for continuing to do good research.

I continued to write papers and do community-based research, which gradually became my strength. And since I had worked on substance abuse and HIV, that was my primary area of research, and I continued to write papers and attended all four International AIIDS conferences, with a full scholarship by the conference organizers, in different parts of the world.

In 2004, I got the Hubert H. Humphrey Fellowship, one of the most prestigious fellowships in the world, to do a one-year course at Johns Hopkins Bloomberg School of Public Health. That I will consider a watershed moment in my academic profession and career because in that one year I learned immensely. By that time, I was already in my early 40s. But I studied just like an undergraduate student because ninety percent of my classmates were in the age group of 20-25. I was already an Associate Professor in my institution, but I got an opportunity to learn and re-learn. And that strengthened my knowledge and skills in epidemiology, research methods and biostatistics. I started to get recognized as a good researcher, a good epidemiologist, and having sound knowledge of biostatistics, which did help me. Another important area in which I acquired knowledge and skills was on the application of Geographic Information Systems (GIS) in public health. But I never stopped learning and I continue to learn even today as the Director of ICMR-NIIRNCD. So, in a nutshell, this is how I can describe my professional journey.

# 2. What do you see as the biggest challenge for India in achieving the malaria elimination goal by the year 2030?

I will start with a philosophical answer that many philosophers and successful people say that "Dream Big" – unless you dream big, you cannot think of achieving something. So, I see this as a big dream that the country aspires to achieve and since we have the freedom to dream, we also have the capacity to achieve. So, suppose we target malaria elimination by 2030 and work towards that, I am not predicting or forecasting that we will be able to eliminate it, but at least we will be able to set the malaria elimination program on the right course. When you have a targeted vision, then you start planning accordingly. As a corollary to that, we see the genesis of MERA-India. The first issue in eliminating any disease is to find out where you stand, and for that we need comprehensive research, in terms of looking at the clinical part, vector part, environmental part, and molecular biology aspects of the disease. So, I believe we have started in the exact right direction, and at the same time we have picked up the right challenges. For example, low-density malaria infection is a big challenge because the disease

remains endemic at a low level and we fail to identify the reasons for that low endemicity in our routine malaria-elimination program. So we need to look into more detail, which is what we are harping on. This is, to some extent, also driven by the empirical thought process and that is why we are not sure what are we going to get in the end, or whether we will be able to find out the factors which are going to help eliminate malaria, but, we have to try first. Secondly, we know that the elimination depends on a multi-pronged strategy. Elimination of the vector and the parasite Plasmodium are the key factors. Both have an inherent capacity to build resistance against the drugs and find ways of surviving despite our efforts. At the end of that tussle, we are not sure whether the vector, the Plasmodium or the human species will win. So, that I see as another challenge, but there is scope and with this targeted intensified approach we will be able to make breakthroughs and find methods of controlling both the vector and the parasite and bring malaria to the point of elimination.

# 3. In your opinion and based on your experience, which are the emerging digital technologies/ tools that have the potential to address the gaps in the infectious diseases surveillance in India?

Let's look at the surveillance history and how did we start. We started with door-to-door surveys using paper and pen and collecting data manually. I am talking about the 1970s and 80s. Then, the data collected was in huge volume. Our processing tools were limited, data had to be manually managed, and the computer systems were not really competent or powerful enough to handle and process the data in a fast-track manner. Now, for every disease surveillance, the application of modern computing tools and technologies has dramatically improved our ability to handle data at every stage. First, data collection has become easier with digital tabs and other electronic equipment. Secondly, processing the data so it can be made available in real-time has become possible. If you survey 35 states of the country simultaneously, then within 24 hours you have the data, which is the strength of the technology. And, with the help of artificial intelligence (AI), we can even analyze the data at an immensely faster speed than we were capable of doing 20 or 30 years ago. So that way, technology has come as a boon for us, and it has given us all the tools required to handle the surveillance process in a very efficient manner. It is only a matter of putting the technology to the appropriate use in handling and processing the data, and I see a lot of hope in that.

About GIS, in particular, for all the community-based studies of diseases which are particularly transmissible in nature and dependent on the vector and the parasite, GIS is the tool that helps us identify the distribution and location of different densities of the parasite as well as the vector and the potential sites where the vector will be responsible for the transmission of the disease. GIS is an important tool in the sense that it will help us map the hotspots where the transmission risks are highest or areas where transmission risk is lower, and then we can appropriate our tools and resources to intensify our work in the hotspot areas, and not give uniform distribution of resources to all areas where some do not require and some require

what we are not able to give. So, I see AI, GIS, machine learning and other data analytics tools as very important tools for diagnostic, public health and disease management. So, the more we can understand these tools, the more we can utilize them innovatively in addressing our problems and handling diseases. Take the example of COVID management all over the world, and particularly in our country. The efficiency that we could achieve to control the disease within a year, and develop the vaccine, is growing evidence of how technology and AI can help us manage any disease. So, I am very positive and hopeful that these technologies will help us achieve our target of eliminating malaria by 2030.

# 4. What is one piece of advice that you would like to give to young PhD students and early stage researchers who are keen to foray into the emerging research areas such as GIS & AI?

Another thing I would like to speak from my heart to all the young and budding researchers, is that I have one appeal to make – don't do PhD for the sake of acquiring a degree or getting a secure job. Do PhD if you desire to be a researcher and want to contribute to the betterment of society. You must be passionate, committed, innovative, think outside the box and work as a warrior. Just like a soldier gives everything for the nation on the borders when they have to fight, you must be passionate and committed to becoming a researcher. And acquire during your PhD, the skills and knowledge that will help you think out of the box, be innovative and contribute to the betterment of society. Do your research with that attitude and intention, and every success will automatically follow. You do not have to chase success, instead, it will chase you once you have those personality traits and characteristics in your approach to doing science.

# 5. What significance do you see for MERA-India in achieving India's malaria elimination target?

MERA-India happens to be one of the most prominent research projects in itself. By being involved in it from the very beginning, I have seen how in just two years, it has developed from a concept into a very systematically organized alliance that is addressing the issue of controlling malaria in the country through a multi-pronged interdisciplinary approach. That I see as MERA-India's biggest strength, and I am sure that retrospectively after ten years, we will say that MERA-India happened to be the most successful alliance in itself in demonstrating how the challenge of eliminating malaria can be achieved if you have the right kind of thinking, and develop a right kind of alliance. So, MERA-India is the best thing that has happened to the malaria control programme.

## **Resource for Malaria Researchers: MESA Track**

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Source: https://mesamalaria.org/mesa-track

MESA Track is an open and living online database of research projects relevant to the malaria elimination and eradication research agenda. The projects in this database are broadly categorized under five themes: Basic Science; Challenges in Elimination; Epidemiology; Health Systems & Operational Research; and Response Strategies. The projects can also be looked at based on the funding sources, principal investigators, principal institutions and project sites. This tool is thus a database about the research questions being addressed and the studies being undertaken, thus giving the current scenario of the malaria research. As on date, 1830 projects across 141 project sites and 513 principal institutions are listed on MESA Track. The projects can be added to the MESA Track database through an online submission form at https://mesamalaria.org/mesa-track/submit-your-project.

To know and explore more about MESA Track, visit https://mesamalaria.org/mesa-track

## A Child's Perception of Malaria

In this issue, we showcase the sketch of Miss Jannat Dhaliwal, aged nine years. Through the drawing, Miss Jannat has highlighted the global prevalence of mosquito-transmitted diseases, like malaria, and the importance of mosquito control for a healthy and disease-free world.



**Sketch by:** Miss Jannat Dhaliwal (daughter of Dr Jasmita Gill, ICMR-NIMR Delhi); **Age:** 09 years; **Class:** Fourth

### Upcoming Event Distinguished Lecture by Dr Ashwani Kumar

We are pleased to announce that Dr Ashwani Kumar, Director ICMR-VCRC, will be our next speaker for the Distinguished Lecture Series, speaking on vector control. The lecture will be held in July, and further details will be shared through our website (<u>https://meraindia.org.in/</u>) and social media accounts.

To receive regular updates about the events being organized by MERA-India, please subscribe at <u>https://www.meraindia.org.in/event\_sub</u>

### Announcements

#### **BMJ Global Health Grant 2022**

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1	We are pleased to announce the launch of the 2022 BMJ Global Health Grant.					
	BMJ has always strived to support early career researchers in low-income and lower-middle-income countries (LMICs).					
	Established in 2019, the BMJ Global Health Grant recognises early career researchers from LMICs working in the field of					
BMJ Global Health	global health and is awarded to the applicant whose abstract describes the most original methodological contribution to					
Grant	the field of global health and whose summary demonstrates the greatest importance and potential impact in advancing the field.					
	This year the successful applicant will receive funding of up to GBP 5,000 to support attendance at the 7th Global					
	Symposium on Health Systems Research (HSR 2022) in Bogota, Colombia (31 October-4 November 2022), and the					
L	opportunity to publish a full paper in BMJ Global Health at no cost (article processing charge waived).					
	Find out more in the section below on eligibility criteria, how to apply and details of previous recipients of the Grant.					
	The deadline for applications is 15 July 2022.					

Source: https://gh.bmj.com/pages/bmj-global-health-grant?int\_source=wisepops&int\_medium=wisepops&int\_campaign=competition

Applications are invited from early career researchers from low-income and lower-middleincome countries working in the field of global health for the 2022 BMJ Global Health Grant. The award includes funding up to 5,000 GBP to support costs towards participation at the 7th Global Symposium on Health Systems Research to be held in Bogota, Colombia from 31<sup>st</sup> October to 04<sup>th</sup> November 2022, and an opportunity to publish in BMJ Global Health with the article processing charges waived off.

The application deadline is 15<sup>th</sup> July 2022.

For more details, visit: <u>https://gh.bmj.com/pages/bmj-global-health-grant?int\_source=</u> wisepops&int\_medium=wisepops&int\_campaign=competition Infectious Diseases of Poverty Journal: Call for papers From malaria elimination to malaria eliminated: learning by doing



Source: https://idpjournal.biomedcentral.com/call-for-papers-malaria-elimination

The BMC open access journal Infectious Diseases Poverty is launching a special thematic series on malaria titled "From malaria elimination to malaria eliminated: learning by doing".

For this series, the call is open for the submission of scoping reviews, research articles, case reports, case studies, commentaries, letters to the editor, opinion papers, short reports and study protocols.

For further details, visit <u>https://idpjournal.biomedcentral.com/call-for-papers-malaria-elimination</u>

## **Recent Publication**

Sharma S, Verma R, Yadav B, et al. What India can learn from globally successful malaria elimination programmes. BMJ Global Health 2022;7:e008431. doi:10.1136/ bmjgh-2022-008431



In this <u>article</u>, the authors (from ICMR, NIMR and MERA-India) have presented an overview of the strategies adopted by nine countries that have successfully eliminated malaria in the past decade. These strategies and the challenges to the adoption of these strategies in the context of India's malaria elimination programme have further been discussed.

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