



Virtual Keystone Symposia
"Malaria in the Era of COVID-19"

Complete series



*MESA Correspondents bring you cutting-edge coverage
from the Virtual Keystone Symposia "Malaria in the
Era of COVID-19"*

16 - 17 March 2021

Virtual Conference

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Day 1: 16th March 2021

Welcoming Remarks and Keynote Address



The opening remarks of the Virtual Keystone Symposia were led by the organizers **Regina Rabinovich** (Barcelona Institute for Global Health - ISGlobal, Spain) and **Abdisalan Noor** (World Health Organization - WHO, Switzerland). Rabinovich highlighted that innovation was more than product development, but also how impact can be maximised with already existing interventions in the field. She added that the sessions would look into how to sustain and advance impact by innovative thinking, and rethinking the way we mobilise science while living in these extraordinary times.

The keynote talk by **Pedro Alonso** (World Health Organization - WHO, Switzerland) addressed overcoming complex challenges for malaria and COVID-19. Alonso gave an overview of the historical achievements in the last 20 years in the fight against malaria, including, changes in malaria burden and investment, the establishment of The Global Fund and other major initiatives, the use of insecticide-treated nets (ITNs), rapid diagnostic tests (RDT), and chemoprevention in vulnerable populations such as pregnant women and children. However, stagnating funding, imperfect delivery of commodities, and gaps in intervention coverage challenge the achievements on the way toward fulfilling the global strategic targets. Apart from that, weak health systems were characterised by a dearth of direct surveillance of health information. Alonso pointed out that the optimal response varied between countries and even within single countries. He reminded of the importance of fighting malaria in the ten countries with the highest malaria burden in Sub Saharan Africa, and India. The high burden to high impact (HBHI) initiative calls for adopting tailored responses that include optimising and implementing multiple tools on community and national levels. These efforts must coincide with cyclic seasonal malaria chemoprevention (SMC). Alonso also raised that intermittent preventive treatment (IPT), although improving, is not effectively reaching its target population. In order to decrease malaria burden and mortality, it is urgent that problem-solving approaches used are aggressive and targeted, with a focus on countries with the highest malaria mortality. Alonso concluded his talk by emphasising the critical role of chemoprevention, a highly

efficacious intervention, in the HBHI initiative in addition to the establishment of cross partnerships, development of vaccines, new tools and a mindset that adopts a problem-based approach.

Lessons learned from the Ebola experience

The first lesson **Jestina Doe-Anderson** (GE2P2 Global Foundation, USA) pointed out in her talk was that prevention could help save lives. Malaria research, control schemes and their effective implementation are at risk and disrupted in the wake of emerging diseases as was the case in the Ebola outbreak of 2014-16 and now in the COVID-19 pandemic. Social mobilisation, community engagement and communication are forerunners at the onset of a disease outbreak. These activities are important for ensuring and promoting community trust in the health system and other essential services. Furthermore, they dispel any misinformation that is spread regarding new and emerging diseases. If the community distrusts and fears the health system, people increasingly refrain from seeking healthcare and reporting any illness. Moreover, sometimes infected people become stigmatised and isolated from society. Stigmatisation can be counteracted by social mobilisation (for example using billboards, radios, and talk shows). She warned that due to rumours and misinformation, people might avoid certain interventions for fear of becoming infected. Doe-Anderson underlined that social mobilisation keeps the community informed with relevant and up-to-date information that can be easily assimilated and understood. Literacy should not be taken as a pre-requisite to understand medical or public health concepts. Social mobilisation fosters a more accepting attitude within the community by adapting local approaches that result in active public participation and adherence to health guidelines reducing transmission.

Question and Answer Session

Q: Given the striking difference between COVID-19 and malaria vaccines, why do you think that the malaria vaccine was not as quickly developed?

Pedro Alonso named a failure of the market to drive the development as one of the reasons. Diseases with a high burden in the global population would not always attract the highest investments, and that was why vaccine research and development for HIV, malaria and neglected tropical disease vaccines were still lagging behind. Furthermore, *Plasmodium spp.* are complex biological organisms with complex host-parasite interactions and their naturally induced human immunity and relevant parasitic epitopes are not well defined. Lastly, malaria is a systemic problem that does not affect the wealthier global community, resulting in a lack of research funding in areas that are burdened with malaria. A vaccine is a key component of malaria eradication and elimination. Currently, a first-generation vaccine is under development and clinical trials are run in three countries, but more than one vaccine is needed.

Q: What is a key factor in the uptake of vaccines in general?

Jestina Doe-Anderson underlined that the community response varied by location and highly depends on how the message is delivered to the community as well as how the community perceives the emerging disease and its vaccine.

Q: IPTs, MDA and SMC development, what is the way forward?

Pedro Alonso answered that vector control was the backbone of malaria eradication but could not be the sole answer. The global community was hesitant to use antimalarial drugs as a complementary tool for further reducing the malaria burden. This would be an effective complementary tool in endemic countries that are currently not using IPT, MDA and SMC. He lamented that there was an ill-

conceived and non-data-driven fear of creating resistance to antimalarial using these approaches but in the near future, chemoprevention would be a necessary addition to the toolbox.

Panel: Malaria Research Funding in the COVID-19 Context

The panel formed by **Alexandra Cameron** (UNITAID, Switzerland), **Michael Makanga** (European and Developing Countries Clinical Trials Partnership - EDCTP, Netherlands), **Lee Hall** (National Institutes of Health - NIH, USA) and **Scott Miller** (Bill and Melinda Gates Foundation - BMGF, USA) focused on their experiences on research funding programs in infectious diseases and malaria during the pandemic. Some of the issues discussed were the effects of the COVID-19 pandemic on malaria research and examples that institutions have adopted, lessons learnt from responses in COVID-19, reshaping priorities for malaria research, and the economic impact of the pandemic. All four panellists underlined that most organisations have been substantially affected by the pandemic, especially as personnel and resources are being reallocated to SARS-CoV-2 research. Nevertheless, creative measures to protect investments in malaria research are being taken. Some of the measures would include; monitoring funding expenditure, targeted funding, development of COVID-19 trackers, undertaking implementation research, and utilising telecommunication access provided by the pandemic, to raise malaria elimination and eradication awareness. The panellists also talked about how the COVID-19 pandemic has reshaped how investigators conduct their research. Affected research areas would include evaluation and understanding of all production processes, developing and establishing public and private partnerships, promoting global coordination and cooperation, as well as having a multidisciplinary approach to tackling malaria. Most importantly, investigators must assess and implement relevant strategies that will strengthen already fragile healthcare systems' preparedness. This can be achieved by long-term thinking of product development. The thought process requires a holistic approach that considers disease interconnectedness. With this mindset, proper resource management and motivation may accelerate approval of clinical trials and the use of novel products to advance prevention, diagnosis and treatment of malaria and other infectious diseases.

At the end of the panel, the organizers thanked the panellists and audience for their time and participation, and encouraged everyone, almost 300 participants, to join the poster presentations with live discussions, and the networking lounge.

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Day 2: 17th March 2021

Notification of Top Three Posters

Regina Rabinovich (Barcelona Institute for Global Health - ISGlobal, Spain), welcomed the attendees to the second day of the keystone symposia. Rabinovich announced and congratulated the three poster prize winners Piyawan Kochayoo (Thailand), Ifeoma Ozodiegwu (Nigeria) and Shweta Singh (India). She then outlined the sessions of the day, including interesting panel discussions on career development, a talk by Abdisalan Noor and short talks by the poster prize winners and a closing keynote given by Francine Ntoumi.

Career Roundtable

Following the opening remarks, **Sarah K. Volkman** (Harvard T.H. Chan School of Public Health, USA) chaired the career roundtable featuring **Hernando del Portillo** (Barcelona Institute for Global Health - ISGlobal, Spain), Kimberly **A. Lindblade** (World Health Organisation - WHO, Switzerland), Ifeyinwa **Aniebo** (Harvard University, USA) and **Sam Kinyanju** (Wellcome Trust, Kenya).

The panellists occupy various roles in the field of malaria ranging from research to policy. All agreed that the biggest benefit of their positions was working in interdisciplinary teams, which stimulate interactions between people from different cultures, diverse partnerships, the possibility to attend training in academia and to push public policies.

Q: Which challenges did you experience in your early career years?

The panellists faced numerous challenges in their career development path, like inadequate funding, lack of mentorship, low-quality PhD programs in low-middle income countries (LMIC), inadequate projects, and a shortage of training and proper communication. Opportunities that advanced their career were the availability of fellowships, outstanding mentors, passion, and engaging in writing and public speaking competitions. One specific advice for early career researchers was to start off by conducting well-funded projects and pursue their research interests afterwards, to facilitate getting established in their research and finding mentors.

Another often missed opportunity pointed out by the panellists was that scientists often did not get exposed to training or mentorship for management and leadership skills during their early career years. Thus, they highly encouraged early-career scientists to take any opportunity offered for these skills, in addition to learning how to communicate well with people from various positions. Being able to adapt your conversations to align with the goals of those you intend on collaborating with will make your research more impactful.

Q: Which main barriers did you face in malaria-endemic countries?

One of the barriers mentioned related to transfer research skills acquired abroad back to the home countries comprises a lack of investments by governments in LMICs. Researchers trained in countries that are more technologically advanced may often find it difficult to align their implementation plans and methodologies in LMICs, hence remain where they have been trained, or with similar high standards, while keeping collaboration with their home country.

Another barrier identified is that early career researchers are not receiving enough training to help them successfully apply for international grant proposals. The lack of appropriate training and support of seasoned mentors could be overcome by online conferences. One of the tips given was that young

scientists in such countries should prioritise attending conferences where they should proactively interact with each other and start collaborations, instead of only listening to talks. Furthermore, they should make more use of available platforms such as the African Academy of Sciences, which aids in programs developing upcoming scientists.

The last barrier mentioned was that when early career researchers are placed in either a teaching or managerial position, they find it difficult to continue with their research and development, which is a barrier to their capacity building. Mentioned was also that, the lack of visibility of women in science in general and in particular in the public health sector should be reverted with proper support and inclusive policies.

Finally, the panelists recommended that young scientists should not think of their life as a career but rather, one of research. The scientific field is dynamic and requires an open-mind for the possibilities that present themselves. Being open-minded will allow growth and gain knowledge, resulting in a change of research interests allowing for greater impact. Panelists emphasised and advised researchers to strive for excellence as they pursue their dreams.

Redefining Targeting of Malaria Interventions to Accelerate Impact

Abdisalan M. Noor (World Health Organisation - WHO, Switzerland) began his talk by alluding to Pedro Alonso's keynote address from the previous day, which highlighted the limitations imposed by interventions, funding, surveillance and COVID-19 disruptions on research. He emphasized that accepting malaria as a complex and dynamic system would change our mindsets to foster creative solutions. Intervention planning should not solely be based on transmission but should also understand and paying attention to impact determinants as well as the influence these determinants have on a political and social level to reduce the burden and eliminate malaria. An evidence-informed approach, that aims to understand the whole process from different perspectives, opposite to a solely evidence-driven approach, would be crucial in strategic intervention planning in countries. A failure to understand the complexities of malaria can lead to simplistic solutions that would become costly in the long run and undermine the ability of the health system to think dynamically. To be effective and successful on a national scale, a thorough decision-making process is required, including understanding the epidemiology and embracing disease complexity.

Poster Prize Winners Short Talks

The talk by **Piyawan Kochayoo** will be available soon.

Ifeoma Ozodiegwu (Northwestern University, USA) talked about the application of mathematical models of malaria transmission to inform national strategic planning in Nigeria. The epidemiological modeling software (EMOD) combines a model of temperature-dependent vector life cycle and vector population dynamics, with a model of human disease immunity and intervention effects. The model was calibrated to the malaria seasonality and transmission intensity in Nigeria, also taking into account country specific intervention coverage. Several alternative intervention combinations of interest to the Nigerian government were simulated to predict impact on malaria morbidity and mortality from 2020 to 2030.

Shweta Singh's (International Centre for Genetic Engineering and Biotechnology - ICGEB, India) poster talk was about how *Plasmodium falciparum* Eps15 homology domain-containing protein (*PfEHD*) is capable of remodelling membranes and regulating specific endocytic transport steps in eukaryotic cells. Her study focused on how the parasitic membrane-bound *PfEHD* could migrate through the parasite's cytosol and culminate into a large multi-vesicular structure near the food vacuole. She found

that eukaryotic endocytosis inhibitors are able to prevent both the development of PfEHD-labelled vesicles and binding of the vesicles onto their target site.

Closing Keynote Address

Philip Welkhoff (Bill and Melinda Gates Foundation - BMGF, USA) chaired the closing Keynote that was done by **Francine Ntoumi** (African Academy of Sciences, Republic of Congo) on “Giving malaria a dose of our COVID-19 response”. Ntoumi outlined the milestone reports, guideline procedures and data concerning COVID-19. The short time frame that it took to understand the COVID-19 virus and epidemiology as well as to develop or scale up intervention methods, especially vaccines were a great surprise with mixed feelings. While vaccine research and development for COVID-19 had accelerated thanks to amazing scientists around the entire globe, no comparable progress has been achieved for malaria, despite decades of efforts. Despite the long period and huge malaria burden across many malaria-endemic countries, only one malaria vaccine is currently under development, which is still in phase 4 compared to 12 vaccines developed for COVID-19. To move forward, Ntoumi emphasised resource mobilisation, continuous international dialogue, and increased support from the private sectors as well as strengthening inter-laboratory collaborations amongst others to tackle the malaria burden faced in Sub-Saharan Africa. She concluded her keynote address by urging everyone to stay engaged until the malaria community has reached its goal – a malaria-endemic free world through its eradication and elimination.

Concluding Remarks

At the end of the Keystone Symposia, Abdisalan Noor thanked all the speakers and attendees as well as the organizers of the eSymposia. He stated that 268 attendees from 47 countries registered at the Malaria in the Era of COVID-19 eSymposia.

Regina Rabinovich summarised the key points made by the speakers and highlighted lessons learned from the two-days. She closed the eSymposia with the following sentence from Zero Malaria, “**Malaria, we are too brave for you,**” and called for action from all the people to be part of the solution. She further thanked Keystone and MESA for organising the event.

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