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Review

Challenges with the proposed approach in enhancing the accessibility of antimalarial activities during COVID 19 pandemic

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ABSTRACT

COVID 19 has hardly left any part of the world untouched. Two hundred thirteen countries have been affected by this disease, with 17,208,224 cases and 670,626 deaths as of July 30, 2020. If we look at the death toll caused by Malaria, this year, it is closely nearing COVID 19 deaths, 5, 68,700 deaths. Malaria mostly occurs in poor, tropical, and subtropical regions across the globe. In 2018, Malaria was most rampant in Africa, followed by Southeast Asian Regions (SEAR). SEAR is at the greatest risk of both COVID 19 and malaria. Strategies for essential commodities and antimalarial activities are affected by COVID 19 when the rainy season registers the maximum malaria load. We searched the literature to explore the evidence regarding efficacious antimalarial activities and the gap created by the COVID 19 pandemic, responsible barriers, and challenges, with the possible approaches towards accomplishing a target for malaria control.

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Introduction

COVID-19 has affected nearly 213 countries and territories. As of July 30, 2020, total cases were 17,208,324, with a total of 670,626 deaths. Most cases (5,360,200) were reported in North America, followed by Europe, Asia, South America, Africa, and Oceania [Table 1] [1]. Asia is registering an increasing number of new confirmed death due to COVID-19 [2,3] [Fig. 1].

In this exacerbating situation, nearly 56,870 deaths are also caused due to malaria this year [4]. In the last 15 years, from the year 2000 to 2015, WHO has estimated the global fatality due to malaria from 839,000 to 438,000 deaths [5]. Malaria mostly occurs in poor, tropical, and sub-tropical regions worldwide. Africa posed the most favorable weather condition for the highest transmission. Lack of resources and socio-economic instability has also severely hampered efficient malaria control activities in Africa. In other regions of the world, South America and South Asia also have a considerable count of cases [Fig. 2]. In 2018, most cases were in the African Regions, followed by South-East Asia, with most Indian cases (47%) [6]. Fifteen countries in sub-Saharan Africa and India did bear the brunt of 80% of the total malaria burden. Presently, all countries are facing the risk of COVID-19, and nearly half of the world is at risk of malaria. Sub-Saharan countries are tolerating the severity of malaria and its mortality, but South East Asia is at higher risk of both malaria and COVID-19 [7]. During the rainy season, malaria transmission touches its height [6]. Unfortunately, strategies for essential commodities and antimalarial services are affected by COVID-19 nowadays [8]. However, a lesson learned from the Ebola Virus Disease outbreak: implementation research has its scope in addressing the gap and applying evidence in existing health programs and policy [9].

In this review, the authors emphasized finding out the answers to questions arising. What could be the gap in accessibility of efficacious intervention to control malaria during the COVID-19 outbreak? What could be the barriers and challenges in implementing antimalarial activities during COVID 19 outbreak? What could be the proposed approach in enhancing the accessibility of antimalarial activities during the COVID-19 outbreak?

Search strategy

We searched the literature to find out the articles related to efficacious intervention to control malaria and gap created by COVID-19 pandemic in the accessibility of these interventions, possible barriers and challenges hindering the achievement of targets, and possible approaches in enhancing the accessibility of antimalarial activities during COVID 19 outbreak.

We browsed PubMed, Embase, Cochrane, Scopus, and Google Scholar databases till July 30, 2020, using keywords as (Malaria OR Antimalarials) AND (COVID 19 OR coronavirus OR 2019-nCoV OR SARS-CoV OR new corona virus OR novel corona virus); (season OR Weather) AND (malaria transmission); (Barriers OR challenges OR access to services OR supply chain OR health workers OR economy) AND (antimalarial activities); (COVID 19 OR social distancing OR lockdown) AND (antimalarial activities); (COVID 19) AND (antimalarial drug OR chloroquine); (Mass drug administration OR malaria) AND (COVID 19); (Public health measures OR social measures) AND (COVID19); (Ebola virus disease) AND (strategy OR implementation science); (COVID 19) AND (internet OR communication).

We also retrieved the references of the articles to find the relevant literature. We have also accessed relevant news (economic times and times of India) and websites (WHO, world meter, world data, National Health Mission, and Rural health statistics-Open Government data platform) to get sufficient literature.

Gap in the accessibility of efficacious intervention during COVID 19 outbreak

In the last 15 years, WHO has estimated the global fatality due to malaria from 839,000 deaths in 2000 to 438,000 in 2015 [5]. However, the number of malaria deaths was 405,000 in 2018 [7]. Data suggested that we have efficacious malaria control interventions, which decreased the malaria burden in past decades [10]. This year, during COVID 19 outbreak, estimated deaths due to malaria were nearly 56,870, which is high compared to the year 2018 [4]. Even in Sub-Saharan Africa, COVID 19 sets the alarm to WHO, and it is projected that death due to malaria might be doubled by 2020 compared to 2018 [11].

COVID 19 outbreak presenting a challenge for the health systems across the globe. Continuously enhancing demand for care of infected people with COVID-19 is overwhelmed by fear, misinformation, and travel restrictions of people that disrupt the delivery of health care for the community and directly or indirectly increase mortality even with preventable and treatable conditions [12]. As malaria transmission is seasonal in certain places, it may impose a severe pandemic burden [13].

This explanation addressed the gap created by the COVID 19 pandemic on the implementation of efficacious antimalarial activities. It is now needed to find out the possible barriers and challenges responsible for creating a considerable gap or burden on the community even after efficacious interventions.

Barriers and challenges in implementing antimalarial activities

COVID 19 affects malaria-endemic regions, mainly South America, Sub-Saharan Africa, and Southeast Asia. In South America, lockdown restricted the movement and compromised health services, and increased the burden of diseases. According to the Pan American Health Organization (PAHO) update, COVID-19 transmission created a more critical situation in rural malarial areas, with high vulnerability and weakness in the health care system [14]. As modeling analysis conducted by WHO and its partners predicted, the number of deaths due to malaria might double in sub-Saharan Africa this year alone due to disruption in the accessibility of antimalarial commodities due to COVID-19 [11]. This worst scenario is also overwhelmed by a suspension of insecticide-treated net campaigns and failure to access effective antimalarial medicines, resulting in malaria deaths in sub-Saharan Africa in 2020, an estimated reach of 769,000 [15].

It is the necessity of an hour to identify those barriers and challenges affecting the antimalarial activities during the COVID 19 pandemic.

Access to services

During the West African Ebola virus disease outbreak, it posed a challenge in utilizing routine health services beyond the path of mortality [16]. Consistently during COVID 19 pandemic, poor access

| Continents     | Number of cases | Number of death |
|----------------|-----------------|-----------------|
| North America  | 5,360,200       | 214,757         |
| Europe         | 2,840,967       | 202,698         |
| Asia           | 4,140,767       | 94,257          |
| South America  | 3,952,480       | 139,781         |
| Africa         | 895,157         | 18,908          |
| Oceania        | 18,032          | 213             |
to health services also affects the utilization of reproductive and child health services and causes approximately 28,000 maternal deaths and 168,000 newborn deaths in low-middle income countries [17].

Even in India, poor access to medicines, bed nets, and diagnostic kits affected the malarial control activities drastically not only to urban even rural regions also, which showed currently a decline in health facilities, 18 percent at Sub-Centers, 22 percent at Primary Health Centers and 30 percent at Community Health Centers by March 2018 [18].

Recognizing lockdown and social distancing as barriers to access health services for patients, especially for people living in rural areas, the Ministry of health and family welfare issued guidelines to maintain essential services of reproductive and child health, prevention and treatment of communicable diseases and chronic diseases to avoid associated complications, and identifying emergencies [19]. In African regions also, the lack of testing and contact tracing poses a concern for public health. Another reason people reluctantly seek treatment due to fear of exposure to the coronavirus in a crowded place [20]. Limited access to essential medicines has created patients’ conditions to use substandard drugs or doses [21].

**Supply chains**

Lockdown disrupted the production and supply of antimalarial commodities in China and India, which previously supplied more than 20% of all generic drugs to Africa. Simultaneously, the COVID-19 pandemic also indirectly disrupted several other essential malaria commodities, such as long-lasting insecticidal nets, rapid diagnostic test kits, etc. As there are no definite therapies for the COVID-19 virus, some scientists have convinced the antimalaria drug chloroquine could be effective against the coronavirus, which again created a global surge in chloroquine demand.
Consequently, the lack of availability of antimalarial commodities will likely lead to an increase in malaria mortality and morbidity. In COVID-19, consequences, not only production but even suspension of the importation and exportation, also poses a challenge for the availability of these antimalarial commodities [21].

Shortage of manpower

Due to the Covid-19 outbreak’s worst condition, health workers are also facing a risk of morbidity and mortality. Lack of personal protective equipment with exposure to infected patients and the heavy workload is currently entrusted upon health workers at risk for Covid-19 infection [23].

It is required to have personal protective equipment for healthcare workers to protect themselves from being infected and infecting others. However, shortages are leaving health workers dangerously ill-equipped to care for COVID-19 patients. Travel restrictions and limited access to supplies such as gloves, medical masks, respirators, goggles, face shields, gowns, and aprons affect the availability of manpower to fight COVID 19 [24]. Additionally, data suggested that community health workers’ engagement towards COVID 19 reduced the fight against malaria [25].

Loss of economy

COVID 19 outbreak resulted in the world’s biggest lockdown affecting the production and supply of masks, testing kit, drugs, etc. It has drastically brought down the production at factories, businesses, flights, trains, and banned movement and simultaneously increased demands of these essential commodities, posing a challenge to many countries’ economies [26].

Interruption of programs

In this pandemic interruption of supply, health workers’ involvement in COVID 19 and social distancing again posed a challenge and responsible for the suspension of the insecticide-treated net and indoor residual spraying campaigns in many malaria-endemic countries [22].

The proposed approach in enhancing the accessibility of antimalarial activities during the COVID 19 outbreak

It is well known that there are no vaccines and definite treatment available for COVID-19 disease. Therefore the efforts to analyze the gap in efficacious interventions imposed barriers and challenges with effective measures to fill that gap are required in reducing morbidity and mortality due to malaria in COVID 19 outbreak [27].

A lesson learned from Ebola Outbreak in West Africa in 2015, in which higher morbidity and mortality occurred due to malaria compared to the Ebola virus disease itself, resulting in intense disruption of health-care facilities, antimalarial commodities, and manpower [28]. Shreds of evidence from this outbreak focus on critical significance in identifying, developing, and testing strategies to facilitate the efficacious interventions during pandemics, to mitigate the additional loss to essential health services [29]. Implementation science focuses on applying frameworks, measures, and implementations of interventions in real-world settings [30].

Evidence developed through implementation research provides a framework to respond during epidemics or pandemics. Similarly, COVID 19 outbreak emphasizes the need to adopt implementation science methods to prevent its consequences with malaria-endemic in tropical regions [31]. The success of implementing effective measures depends on the adequate availability of supporting evidence and resources [27].

Evidences facilitating in adopting implementation research strategy

Clinical features and treatment

Malaria shows some of the highly identifiable symptoms with COVID-19, like fever, shortness of breath, fatigue, and acute onset headaches. Even respiratory distress is also present in children with malaria; these symptoms may be misidentified as COVID-19 [32]. Additionally, people infected with any of these diseases may remain asymptomatic for a longer period [33]. Thus, undetected COVID-19 virus and malaria parasite infections pose an immediate health challenge to the community’s individual and public health consequences [7,34]. The definitive approach to identify the infection is laboratory investigation but no specific treatment available for COVID-19. In some studies, chloroquine, an antimalarial drug, has been proven effective against the COVID 19 [35]. The effective results and low side effects of chloroquine in long-term use suggest a possible use of chloroquine in mass prophylaxis in people exposed to COVID-19 and pregnant and lactating mothers [36,21].

Mass drug administration

A lesson has been learned from the Ebola virus outbreak, which affected health services’ utilization and created a burden of additional mortality beyond the disease [12]. Mass drug administration
is a strategy recommended by WHO for reducing malaria mortality and morbidity during complicated emergency settings, which covered the community of a targeted population for drug administration (antimalarial medicines) regardless of symptoms of the disease. It has the potential to reduce morbidity and mortality and pressure on the health system during the COVID 19 outbreak with the dual benefit of prevention and treatment for both malaria and COVID 19. It demands consideration to ensure the supply of necessary commodities, adequate training, and supervision so that the benefits outweigh the imposed risk on the health system with public and social measures [39].

Surveillance, communication and information systems

In view of the COVID 19 outbreak, WHO tailored the surveillance and information systems to document and track suspected, confirmed cases and deaths, considering innovative digital platforms that may help in the understanding of prompt counting, reporting, and its movement in populations with similar practices of data on malaria. Timely dissemination of information and analyses with internet communication and virtual meetings may summarize and share the quality data on malaria across the national system; otherwise, staff meetings and assembling are often required to share information [39]. It may also be expressive and informative also, an engaging community, households, and individuals with acceptable health practices and supporting all health programs and actions.

Conclusion

This review focused on the rapidly rising malaria cases even after efficacious interventions as antimalarial activities. It reflects a huge gap in the accessibility of antimalarial activities. Pieces of evidence also suggested the possible barriers and challenges imposed by COVID 19 in the accessibility of antimalarial activities as poor utilization of routine health services, interrupted supply of antimalarial commodities, shortage of manpower, loss of economy, and interruption of antimalarial campaigns due to lockdown and social distancing. Travel restrictions and limited access to supplies affect the availability of manpower to fight malaria.

Additionally, data suggested that community health workers’ engagement towards COVID 19 reduced the fights against malaria. The above-discussed premises highlight the critical significance of encouraging efforts towards preventing, detecting, and treating malaria during the COVID 19 pandemic.

This review also summarized some evidence facilitating the adoption of an implementation research strategy to overcome the gap in accessibility of efficacious antimalarial services. Highly identifiable clinical features of malaria and COVID 19 with the proven effectiveness of chloroquine, an antimalarial drug against the COVID 19, also directed mass drug administration of chloroquine to reduce missed opportunities for malaria testing in case of COVID-19 negative while they might be positive for malaria.

Shortage of health workers and increased demand during crisis favors the engagement of relevant COVID-19 health workers to effectively use available resources for malaria with best practices of public health and social measures and effective surveillance, communication, and information systems created through the internet.

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Ethical approval

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