

Global **Malaria** Programme

Tailoring malaria interventions in the COVID-19 response



Tailoring malaria interventions in the COVID-19 response



This document is provided as of 3 April 2020 and will be updated when additional information becomes available



World Health
Organization

Tailoring malaria interventions in the COVID-19 response

© World Health Organization 2020

Some rights reserved. This work is available under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 IGO licence (CC BY-NC-SA 3.0 IGO; <https://creativecommons.org/licenses/by-nc-sa/3.0/igo>).

Under the terms of this licence, you may copy, redistribute and adapt the work for non-commercial purposes, provided the work is appropriately cited, as indicated below. In any use of this work, there should be no suggestion that WHO endorses any specific organization, products or services. The use of the WHO logo is not permitted. If you adapt the work, then you must license your work under the same or equivalent Creative Commons licence. If you create a translation of this work, you should add the following disclaimer along with the suggested citation: "This translation was not created by the World Health Organization (WHO). WHO is not responsible for the content or accuracy of this translation. The original English edition shall be the binding and authentic edition".

Any mediation relating to disputes arising under the licence shall be conducted in accordance with the mediation rules of the World Intellectual Property Organization.

Suggested citation. Tailoring malaria interventions in the COVID-19 response. Geneva: World Health Organization; 2020. Licence: CC BY-NC-SA 3.0 IGO.

Cataloguing-in-Publication (CIP) data. CIP data are available at <http://apps.who.int/iris>.

Sales, rights and licensing. To purchase WHO publications, see <http://apps.who.int/bookorders>. To submit requests for commercial use and queries on rights and licensing, see <http://www.who.int/about/licensing>.

Third-party materials. If you wish to reuse material from this work that is attributed to a third party, such as tables, figures or images, it is your responsibility to determine whether permission is needed for that reuse and to obtain permission from the copyright holder. The risk of claims resulting from infringement of any third-party-owned component in the work rests solely with the user.

General disclaimers. The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of WHO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by WHO in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by WHO to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall WHO be liable for damages arising from its use.

The recommendations contained in this publication are based on the advice of independent experts, who have considered the best available evidence, a risk-benefit analysis and other factors, as appropriate. This publication may include recommendations on the use of medicinal products for an indication, in a dosage form, dose regimen, population or other use parameters that are not included in the approved labelling. Relevant stakeholders should familiarize themselves with applicable national legal and ethical requirements. WHO does not accept any liability for the procurement, distribution and/or administration of any product for any use.

Table of contents

List of contributors	v
List of abbreviations/acronyms	vi
Jointly addressing endemic malaria and pandemic COVID-19	vii
Key recommendations	viii
Introduction	1
Service provision for malaria prevention and treatment in the context of the COVID-19 pandemic	3
Guidance for each of the core malaria interventions	7
Vector control	7
Recommendations for ITN distribution	8
Recommendations for IRS	8
Recommendations for entomological monitoring	9
Case management	9
Chemoprevention	11
Malaria in pregnancy (MIP)	11
Seasonal malaria chemoprevention (SMC)	12
Intermittent preventive treatment in infants (IPTi)	13
Extraordinary interventions	13
Presumptive treatment of fever	13
Mass drug administration (MDA)	14
Possible COVID-19 treatment and the use of chloroquine (CQ) and hydroxychloroquine (HCQ)	14
The role of health structures, systems and staff for cohesive operations	15
References	19

List of contributors

Overall coordination and production of the document was led by Richard Steketee, Jennifer Armistead, Jessie Butts and Meera Venkatesan from the U.S. President's Malaria Initiative. A final review was conducted by the Malaria Policy Advisory Committee, Pedro Alonso, Erin Shutes, David Schellenberg, Peter Olumese and Alastair Robb. This document was assembled, reviewed and edited under the auspices of the "Malaria Response Workstream" that included the following people and their organizations: Maru Aregawi (WHO), Larry Barat (PSI, Impact Malaria), Valentina Buj (UNICEF), Amita Chebbi (APMEN), Marcy Erskine (IFRC and AMP), Akpaka Kalu (WHO), Joshua Levens (RBM), Bruno Moonen (BMGF), John Miller (PATH) Sussann Nasr (The Global Fund), Peter Olumese (WHO), Leonard Ortega (WHO), Jason Peat (IFRC and AMP), Caroline Phiri (PATH), Melanie Renshaw (RBM), Hannah Slater (PATH), Larry Slutsker (PATH) and Ghasem Zamani (WHO).

Organizations represented include the Alliance for Malaria Prevention (AMP); Asia Pacific Malaria Elimination Network (APMEN); Bill & Melinda Gates Foundation (BMGF); International Federation of the Red Cross and Red Crescent Societies (IFRC); PATH; Roll Back Malaria Partnership to End Malaria (RBM); The Global Fund to Fight AIDS, TB and Malaria (TGF); United Nations Children's Fund (UNICEF); United States President's Malaria Initiative (US-PMI); and World Health Organization (WHO).

List of abbreviations/ acronyms

ACT	artemisinin-based combination therapy
ANC	antenatal clinic
CHW	community health worker
CQ	chloroquine
DOT	directly observed therapy
EPI	Expanded Programme on Immunization
HCQ	hydroxychloroquine
HMIS	health management information system
IPTi	intermittent preventive treatment in infants
IPTp	intermittent preventive treatment during pregnancy
IRS	indoor residual spraying
ITN	insecticide-treated net
LLIN	long-lasting insecticidal net
MDA	mass drug administration
MIP	malaria in pregnancy
MoH	ministry of health
NMCP	national malaria control programme
PMI	U.S. President's Malaria Initiative
PPE	personal protective equipment
RDT	rapid diagnostic test
SBCC	social and behaviour change communication
SMC	seasonal malaria chemoprevention
SOP	standard operating procedure
SP+AQ	sulfadoxine-pyrimethamine plus amodiaquine
WHO	World Health Organization

Jointly addressing endemic malaria and pandemic COVID-19

Malaria is a widespread endemic disease that causes illness in approximately 230 million people and kills approximately 430 000 people each year. Over the past two decades, ministries of health (MoHs), national malaria control programmes (NMCPs), district health offices, health facilities and community health workers (CHWs) have done substantial work to dramatically control the disease, and progress is tangible and visible in communities.

Currently, there are effective and affordable prevention measures for malaria. Tests and highly effective drugs that clear the parasite can be used in health facilities or in the community. Trained health staff and CHWs provide interventions to prevent, diagnose and cure malaria. Together, these assets have led to significant success in reducing the morbidity and mortality of malaria over the years.

The rapid emergence and spread of COVID-19 across the world has created massive global disruptions that are impacting people's lives and well-being. There is an urgent need to aggressively tackle COVID-19. Remarkable work is already underway to discover better tests to identify who has the disease and to find preventive and treatment tools to stop the infection. As this work continues, we will need to slow and stop the spread of the disease, provide care for COVID-19 patients, and minimize the impact of the epidemic on health systems, social services and economic activity. Actions to limit transmission from one person to another include reductions in social movement, physical distancing, handwashing and the use of personal protective equipment (PPE) in high-risk settings.

While taking these measures, it is essential that other killer diseases, such as malaria, are not ignored. We know from the recent Ebola outbreak in west Africa that a sudden increased demand on fragile health services can lead to substantial increases in morbidity and mortality from other diseases, including malaria. The COVID-19 pandemic could be devastating on its own – but this devastation will be substantially amplified if the response undermines the provision of life-saving services for other diseases.

The response to the COVID-19 pandemic must utilize and strengthen the infrastructure that has helped health programmes to address malaria and other infectious diseases around the world. If supported, these health systems will help to curb the impact of the COVID-19 epidemic and maintain essential health services. If the systems and staff are not well engaged, however, the gains made in saving lives from malaria and other diseases over the past 20 years may be lost.

In this context, MoHs and NMCPs must ensure that malaria control efforts (and efforts to control other endemic diseases) are not hampered or neglected as they tackle the COVID-19 pandemic. Their people and their systems will be the backbone of the COVID-19 response. This is not the time to stymie health services and undo past gains

against known killer diseases. However, it is the time to strengthen investments in the health system and in community measures so that together we can take on the challenge. This document provides guidance to Member States on how to ensure the maintenance of malaria services as part of the essential health package in the country while working to control COVID-19.

KEY RECOMMENDATIONS

1. Malaria-endemic country governments and their in-country and global partners should ensure flexibility and rapid response to safely serve clients/patients with malaria prevention and case management in areas affected by COVID-19. The country-specific malaria response should consider the critical preparedness, readiness and response actions for COVID-19 (1):
 - Protect the health care workforce (2).
 - Protect clients and patients (3).
2. National and local programmes should continue to provide core preventive and case management interventions for malaria (and other communicable diseases/conditions affecting the population), even with the risk of transmission of COVID-19. Malaria morbidity and mortality pose a substantial risk that is currently being reduced by key core interventions. The continued provision of these interventions is essential to save lives. All intervention delivery should consider the recommended personal and community precautions against COVID-19, which may vary depending on the intervention and its potential associated risk. Programmes should do the following:
 - Ensure that a focal point for malaria is a member of the National COVID-19 Incident Management Team.
 - Ensure continued engagement with all relevant national COVID-19 stakeholders and partners.
 - Ensure continued access to and use of recommended insecticide-treated mosquito nets (ITNs), with distributions organized to avoid large gatherings of people, and permit physical distancing of distributors and beneficiaries while adhering to local safety protocols (4).
 - Ensure the continuation of planned targeted indoor residual spraying (IRS) across communities and households, while closely respecting local protocols for both sprayer and household safety.
 - Encourage early care-seeking for fever and suspected malaria by the general population. To prevent a spike in severe malaria cases and deaths resulting from delayed care-seeking, national and local programmes should reaffirm messaging around prompt care-seeking, while being aware of local personal protection and physical distancing guidelines established by facilities and local authorities.
 - Ensure access to case management services in health facilities and communities with diagnostic confirmation (rapid diagnostic tests [RDTs] preferred over microscopy) for those suspected of having malaria.¹ Malaria can coexist with many other infections, and thus confirming malaria infection with a diagnostic test remains a critical component

1. In contrast to Ebola outbreaks in which blood exposure is a critical risk factor for disease transmission, the patient–health worker exposure is not markedly altered by testing for COVID-19 or malaria, while the benefits of knowing the causative infectious agent are substantial.

of malaria case management. The confirmation of a malaria infection does not rule out the possibility that the patient might also be suffering from COVID-19; similarly, suspected or confirmed COVID-19 patients in malaria-endemic areas should also receive a malaria diagnostic test.

- Ensure treatment of confirmed malaria cases using locally recommended treatment for *Plasmodium falciparum*, *P. vivax* or other malaria parasites, and management of severe disease according to local protocols.
 - Ensure continued delivery of planned preventive services normally provided to specific target populations, including seasonal malaria chemoprevention (SMC) for young children, intermittent preventive treatment in infants (IPTi) and intermittent preventive treatment during pregnancy (IPTp), where currently recommended. Follow the national and local protocols for prevention and containment of COVID-19 when delivering malaria preventive services.
3. Exceptional measures to control malaria – including mass drug administration (MDA) or presumptive treatment – may be required to minimize increased disease and death arising from the COVID-19 pandemic. These measures should only be applied following careful consideration of the context and should be undertaken with due regard to local guidance on reducing COVID-19 transmission.
 4. The core structures and systems for malaria should be maintained and strengthened as a central element of the COVID-19 response. These include:
 - Programme management and planning: NMCPs should be part of COVID-19 task forces in country to ensure that malaria policies and practices are coordinated along with the larger health system changes going into effect due to COVID-19.
 - Commodity supply chain and logistics: The COVID-19 pandemic has disrupted the production and supply of many commodities, including malaria commodities. Changes in malaria control activities may be necessitated by these disruptions (e.g., a lack of RDTs may result in presumptive treatment of fever with artemisinin-based combination therapies [ACTs]) or because of health worker and patient protection needs. Malaria control planning in the context of COVID-19 must consider fragile commodity availability and logistics systems (e.g., increased demand for RDTs, or for ACTs if presumptive treatment is necessary).
 - Information systems: Reporting issues and modified case definitions as a result of COVID-19 will impact apparent malaria epidemiological trends, which feed into critical malaria operational planning (e.g., commodity forecasting). Health management information system (HMIS) and surveillance strengthening efforts should focus on mitigating data quality issues as a result of COVID-19.
 - Communications and community engagement: Any changes to malaria activities will require close collaboration with social and behaviour change communication (SBCC) experts and community leaders in order to ensure community uptake of behaviours to prevent malaria transmission and progression to severe disease. Community behaviours, especially around care-seeking, are likely to shift as a result of COVID-19, and national programmes should anticipate the need to mitigate a growing sense of distrust of health services.
 5. Follow best practices in the prevention and control of COVID-19 as per World Health Organization (WHO) recommendations (5).

Introduction

In January 2020, a novel coronavirus, SARS-CoV-2, was identified as the causative agent of an outbreak of viral pneumonia centered around Wuhan, Hubei in the People's Republic of China. The disease caused by this virus is called COVID-19. The virus is thought to spread mainly from person to person, either between people who are in close contact with one another or through respiratory droplets produced when an infected person coughs or sneezes. These droplets can land in the mouths or noses of people who are nearby and possibly be inhaled into the lungs. It may be possible for a person to get COVID-19 by touching a surface or object that has the virus on it and then touching their own mouth, nose or possibly eyes. In early April, the World Health Organization (WHO) reported 1 million cases across 205 countries and territories and more than 45 000 deaths (6). There has been widespread disturbance of international travel and shortages of medical supplies. In the areas hardest hit, medical facilities have been overwhelmed by the large numbers of severely ill COVID-19 patients. Guidance on how best to tackle COVID-19 is being made available by WHO and other agencies and is being updated regularly (7,8).

The COVID-19 pandemic is characterized by a highly transmissible infectious process. The entire population is at risk of infection and illness, and there is a particularly elevated risk of severe disease among the elderly and those with underlying health conditions. It is possible but currently unknown whether malaria and its consequences, especially severe anaemia, may increase severe COVID-19 disease risk. There is widespread concern for health workers on the front lines and their risk of exposure, illness and ongoing transmission. Personal protection is recommended for workers at all levels of the health care pyramid, particularly in referral hospitals but also in primary health care facilities and for health work done in communities. There is widespread emphasis on testing to identify infected people, to track the epidemic locally, and to share information and communicate well regarding prevention and management. Individuals, households and communities are typically asked to reduce exposure via limiting all travel, self-quarantining, practicing physical distancing and washing their hands regularly with soap and clean water. There are widespread and growing disruptions to the global and local supply chain for all commodities, including food and medical supplies. Intensive efforts are underway to find treatments, preventive therapies and vaccines to mitigate COVID-19 transmission and disease.

MALARIA DURING THE EBOLA OUTBREAK IN WEST AFRICA

As a widely endemic disease across sub-Saharan Africa, malaria has been controlled substantially by the deployment of highly effective interventions delivered through health facilities and in communities. Outbreaks of other non-malaria diseases can stress and disrupt these health delivery systems and lead to dramatic re-emergence of malaria cases and deaths. Most recently, the malaria experience in Guinea, Liberia and Sierra Leone during the Ebola virus outbreak in 2014–2015 has been widely documented and evaluated (9–15). Estimates of the effect of decreased health care access due to the Ebola crisis suggest that the coincident excess malaria deaths in these communities likely greatly exceeded the number of deaths from Ebola virus disease (10); these estimates were consistent with the results of mathematical modelling (15). While COVID-19 is a different virus, transmitted by respiratory means (not blood) and person-to-person exposure, there are concerns about the adverse effects of the pandemic on the existing life-saving infrastructure, as well as its impact on care-seeking and service provision behaviours. Nations cannot afford to have malaria programmes seriously compromised at this time.

Underlying this unprecedented situation is the endemic global malaria problem that still leads to more than 200 million cases and more than 400 000 deaths annually, most critically affecting sub-Saharan Africa where it is a particular threat to young children and pregnant women. Malaria interventions are highly effective, but rely on high population coverage and uptake by individuals and households, especially in rural areas and communities in need. Several of the key malaria interventions are typically delivered in a campaign style, engaging communities and individuals to deliver commodities such as insecticide-treated mosquito nets (ITNs), indoor residual spraying of insecticide (IRS), and seasonal malaria chemoprevention (SMC). These campaigns require the training of groups of health workers and interaction between health workers and individuals in the community to deliver these services. In addition, ITNs may be delivered through routine channels such as antenatal clinic (ANC) visits by pregnant women, children's immunization visits, community structures or school distribution schemes. Finally, malaria case management is critical to the control of infections and the disease. Effective case management requires sick individuals to seek care promptly at the first sign of illness from qualified providers at health facilities or in their community for a diagnostic test and locally recommended treatment for those confirmed positive.

Malaria illness shares some symptoms with COVID-19 illness: fever, headache, body aches and weakness. Malaria can coexist with many other infections. Consequently, confirming malaria infection with a diagnostic test does not rule out the possibility that the patient might also be suffering from COVID-19; similarly, testing positive for COVID-19 does not mean that the individual does not also have malaria infection.

During the COVID-19 pandemic, the malaria community must remain committed to supporting the prevention of malaria infection, illness and death through preventive and case management services, while maintaining a safe environment for patients, clients and staff. Deaths due to malaria and its comorbidities (anaemia, undernutrition, etc.) must continue to be prevented. This document provides overarching principles as well as specific technical guidance for malaria interventions, including prevention of infection and disease, care and treatment of cases, testing, clinical services, supply chain and laboratory activities, during this time of the evolving COVID-19 pandemic. This document will be updated as the situation changes.

Service provision for malaria prevention and treatment in the context of the COVID-19 pandemic

- Support core malaria prevention and case management strategies as per national strategic plans:
 - National malaria control programmes (NMCPs), particularly in sub-Saharan Africa, typically deploy three major categories of core intervention strategies as part of their national strategic plan: vector control with ITNs and with IRS; case management with diagnosis and treatment in health facilities and in communities; and chemoprevention with intermittent preventive treatment in pregnant women (IPTp), seasonal malaria chemoprevention (SMC) in children in countries with highly seasonal transmission, and intermittent preventive treatment in infants (IPTi). There are two main delivery modalities for these interventions. ITNs, IRS and SMC are typically delivered in population-wide campaigns, and the others are delivered through a patient/client-care model (case management in facilities, case management in communities via community health workers [CHWs], IPTp in ANC, IPTi alongside routine immunizations, and delivery of ITNs at patient-care or client encounters in ANC, immunization programme visits and schools). Therefore, it is important to focus on these two main delivery modalities when considering interactions with individuals or populations in the context of reducing the risk of exposure to COVID-19.
 - The risk of exposure to COVID-19 is two-way and applies to i) the person seeking care/receiving an intervention, and ii) the person providing the care or intervention. The extent to which a person can be infected with COVID-19 and be asymptomatic but infectious (i.e., able to infect others with the virus) is not entirely clear. As work continues to understand the risks of transmission, guidelines on social distancing should be observed to the extent possible.
 - Malaria programmes rely on existing service delivery utilizing four critical supportive structures/systems: programme management with NMCPs, regional/provincial leaders and district leaders providing overarching planning, training, supervision and monitoring of programme actions; procurement, supply and logistics systems, which assure that the right quantities of needed commodities and equipment are in the right place at the right time; information systems that count, document and track cases, severe illness, deaths and intervention coverage with ownership and use in populations; and communications and community engagement to promote good malaria prevention and control practices among communities, households and individuals.

- These intervention strategies and critical supportive structures merit immediate attention in order to maintain and enhance the coverage of the interventions. The first priority of malaria programmes in the context of COVID-19 should be to focus on these proven strategies. Other intervention strategies may be included in individual national malaria strategic plans and may be deployed nationally or subnationally. These interventions, their delivery methods and the necessary supply requirements should be considered on a case-by-case basis to determine their continuation in each setting and any measures needed to reduce exposure risks for COVID-19 transmission.
- Respond flexibly to prevailing conditions:
 - Given that the COVID-19 pandemic will present significant challenges, ministries of health (MoHs) and implementing partners need flexibility to innovate and adapt malaria programming to local needs. This will enable programmes to maintain malaria prevention and treatment services, adapt to changing behaviours, ensure reporting and continue overall operations.
 - Recognizing that health workers are at higher risk of exposure to COVID-19, particularly where personal protective equipment (PPE) and infection prevention are insufficient, programmes should anticipate health worker reluctance to provide services and adjust methods and messaging accordingly.
- Protect the health and safety of health workers, staff, patients and clients:
 - Health worker–patient encounters and health worker–community encounters should be as safe as possible.
 - Preventive work for malaria (and for the many other diseases/conditions in the local area) should not put populations or the personnel delivering the services at undue risk of COVID-19.
 - National and local programmes should not stop providing the necessary preventive and curative life-saving services for malaria and other diseases/conditions out of risk/fear of COVID-19 transmission.
 - Where circulation of COVID-19 is likely, any non-essential exposure should be reduced and physical distancing should be created between staff and clients in health care settings.
 - Clients/patients should be protected through appropriate physical distancing when arriving at sites of service delivery and while waiting for the service.
 - COVID-19 prevention should be deployed as per global and national recommendations (16).
- Ensure access to malaria prevention,² care and treatment for all at-risk people in need:

2. N.B., In some countries, additional prevention strategies, such as IPTi (Sierra Leone) and mass drug administration (MDA) (Zambia), are part of the national strategy.

- To the extent possible, ensure continued access and promote the use of recommended vector control such as ITNs, including through mass campaign distribution.
- To the extent possible, continue planned IRS campaigns to protect communities and households.
- To the extent possible, continue planned chemoprevention campaigns (SMC) across targeted communities, where it is currently part of the national strategic plan.
- Ensure early access and use of case management services in health facilities and communities: diagnostic confirmation with rapid diagnostic tests (RDTs) or microscopy for those suspected of having malaria, and treatment of confirmed malaria cases with recommended antimalarial drugs.
- Maintain provision of routine preventive services to specific target populations, such as IPTp and IPTi.
- Leverage existing systems and infrastructure to provide and promote recommended malaria services:
 - Existing supply chain mechanisms should be utilized, supported and improved, where possible, to assure the availability of all necessary supplies and equipment at service delivery sites.
 - Laboratory services should be utilized as needed, particularly for the diagnosis and follow-up of severe malaria cases.
 - Work with any and all partners with current access to communities in need in order to provide preventive and treatment services; such partners could include the local public sector, the formal and informal private sectors, and nongovernmental and faith-based groups.
 - Continue to promote the adoption and maintenance of malaria prevention and treatment behaviours, including ITN use, prompt care-seeking for febrile illness, and uptake of IPTp, with special attention to how the practice of desired malaria-related behaviours might be affected by COVID-19 and vice versa.
 - Maintain and strengthen, where possible, the quality and timely reporting of malaria and COVID-19 cases, and ensure appropriate evaluation and response to the information from existing surveillance systems.
- Consider any needed exceptional circumstances for malaria programmes:
 - Exceptional circumstances may exist, such as a nationwide lockdown in response to COVID-19 and the closure of international borders. Lockdowns severely curtail movement, but exceptions should be made for those in need of health care. In settings where malaria is not endemic, potential COVID-19 patients are advised not to attend health facilities for fear of infecting much-needed health workers. However, in malaria-endemic settings, it is important that patients who may have malaria access a parasitological diagnostic test and receive early treatment with an effective antimalarial.
 - Travel restrictions may make it difficult for some health workers to get to their workplaces, while others may fall sick with COVID-19, leading to a much-reduced capacity in the health system.
 - Lack of availability of commodities for malaria control (e.g., due to interrupted supply chains) or overwhelmed health services may lead to the need for extraordinary measures.

- Global and local information on risk factors for severe disease and death from COVID-19 is being collected. At present, it has not been confirmed whether malaria infection presents an additional risk factor for COVID-19 infection or the severity of the infection. Should this be confirmed, additional or alternative strategies may need to be deployed to reduce malaria morbidity and mortality.
- Potential extraordinary measures include:
 - wide-scale provision of presumptive therapy for fever (assuming that the fever is due to malaria);
 - implementation of time-limited and/or geographically limited mass drug administration (MDA) campaigns.

Such emergency efforts would need to consider the availability of trained staff, adequate supplies of the appropriate antimalarial commodities, permissions or approvals for such wide-scale efforts in the communities, and the availability and use of personal preventive measures to reduce the risk of COVID-19 transmission.

Guidance for each of the core malaria interventions

Overall objective: Ensure the safety of clients, patients, MoH personnel and service delivery teams, while continuing malaria prevention and case management activities to the greatest extent possible. Malaria prevention and treatment is even more important during the COVID-19 pandemic than under normal circumstances. (N.B., Guidance from national MoHs may change and supersede this general control implementation guidance.)

VECTOR CONTROL³

Objective: Ensure the safety of community members, health care staff and service delivery teams, while continuing to implement core vector control activities to the greatest extent possible. Malaria prevention and treatment is even more important during the COVID-19 pandemic than under normal circumstances. (N.B., Guidance from national MoHs may change and supersede this general control implementation guidance).

Recommendations for ITN distribution

Current and planned ITN campaigns should go ahead if at all possible. The following key actions should be implemented:

- Daily reminders should be sent to all registration and distribution teams to wash their hands with soap and water, seek care if feeling sick, and avoid physical contact (handshakes, fist bumps).
- Morning health checks should be reinforced for all distributors, adding temperature checks where feasible.
- All ITN campaign activities – e.g., training, registration, social and behaviour change communication (SBCC) activities, fixed-site distribution, etc. – should be organized in a manner that minimizes the gathering of people (i.e., keeping 2 metres apart and limiting groups to 10 people⁴), and participants should use available precautions for personal protection.
- Countries will have already prioritized areas for ITN distribution based on malaria burden and intervention stratification and this planning should be respected. It is important to note that urban areas with dense populations

3. There is no evidence to date that COVID-19 can be transmitted from one person to another person via mosquitoes; therefore, these vector control recommendations are for the prevention of malaria transmission.

4. The stated limit of a 2-metre distance and 10-person group size may vary based on national or local guidelines.

may have higher risk of person-to-person exposure for COVID-19 but lower rates of malaria infection; if needed, these areas could be deprioritized for ITN distribution compared to rural settings with higher malaria transmission.

- Some campaign activities could expose workers and the public to COVID-19; countries should consider all opportunities to minimize risk of exposure, especially if the activities might not be truly essential (e.g., consider approaches for household registration that minimize person-to-person exposure). However, maintaining and increasing malaria protection does remain essential across the targeted populations.
- In countries that have had mass ITN campaigns in the past few years and do not have ITN campaigns scheduled, messaging to communities should be expanded to ensure that available ITNs are hanging and used, and care and repair of existing ITNs continues.

For more detailed guidance, please see: *Considerations for distribution of insecticide-treated nets (ITNs) amid COVID-19 concerns and in COVID-19 affected countries (4)*, available at: <https://allianceformalariaprevention.com/about/amp-guidelines-and-statements/>

Recommendations for IRS

Move forward with current/planned IRS campaigns, implementing the following key actions:

- Daily reminders should be sent to all spray teams/supervisors/personnel to wash their hands with soap and water, seek care if feeling sick, and avoid physical contact (handshakes, fist bumps).
- The number of handwashing stations and soap should be increased at all IRS operations sites.
- Morning health checks should be reinforced for all spray team members, adding temperature checks where feasible.
- IRS team members should be issued and should wear face masks (including N95 face masks if available in some programmes) and use other routine PPE as soon as they enter operations sites.
- Teams should practice physical distancing, e.g., 2 metres between people, segregation of teams, no more than 10 people in a training group.
- Vehicle passengers should be limited to one team at a time.
- Frequently touched surfaces (e.g., door handles, vehicle railings, etc.) should be wiped down daily with soap and water or bleach cleaning solution.
- IRS spray team breakfasts, morning mobilization, deployment of teams, and end-of-day clean-up should be staggered to allow for physical distancing of at least 2 metres between personnel.
- Clear instructions should be given to families to also practice physical distancing from their neighbours while evacuated from their homes.
- Daily pre-spraying community sensitization campaigns should be reinforced with preventive messages related to malaria and COVID-19.

- Programmes should work closely with local communities and households to address any questions and challenges that may arise in the day-to-day delivery of IRS.

Recommendations for entomological monitoring

Recommend temporarily suspending routine entomological monitoring activities for IRS and ITNs until COVID-19 transmission wanes, with some exceptions, as outlined below:

- Vector bionomics monitoring: Suspend data collection by human-landing catches, pyrethrum spray catches, CDC light traps, etc. until further notice.
- Insecticide resistance monitoring: Continue resistance testing, but only conduct testing using mosquitoes reared from larvae, not from adult collections (e.g., via Prokopack aspirations from houses).
- IRS spray quality and residual efficacy: Conduct initial wall cone bioassays to assess spray quality, but suspend all subsequent monthly bioassays until the situation warrants re-evaluation.
- ITN durability monitoring: Suspend data collection until the situation warrants re-evaluation and a decision can be made as to whether or not data collection should proceed according to the full or a potentially reduced protocol.
- Non-routine entomological monitoring activities: Suspend non-routine monitoring during this interval when COVID-19 is of major concern.
- Insectary maintenance: Make efforts, where possible, to maintain mosquito colonies, while adhering to additional safety precautions (detailed below).

CASE MANAGEMENT

Objective: Ensure prompt access to care and active care-seeking for febrile illness and suspected malaria among the population, and ensure the appropriate testing and treatment of patients – all while maintaining the safety of health workers and clients/patients in the context of COVID-19 transmission. (N.B., Guidance from MoHs in countries may supersede this general case management implementation guidance.)

Malaria case management practices, including testing and treatment, should continue in health facilities and at community level, adhering to national and local protocols for infection prevention and control in order to reduce the risk of transmitting COVID-19 between patients and providers.

Recommended case management principles and activities involve maintaining quality case management for febrile illness and confirmed malaria infections, while minimizing the risk of COVID-19 transmission in the context of patient care. The components of this effort include the following:

- Assure supplies for diagnosis and treatment (RDTs, ACTs, drugs for severe malaria) in all facilities and at the community level (per national protocols) in order to avoid stockouts that disrupt services.

- Protect the health workforce as they engage in patient care that could increase their risk of COVID-19 exposure. Health workers should adhere to national and local policies and procedures.
- Protect individuals seeking care with recommended mitigation and prevention measures (7), as they may face an increased risk of COVID-19 exposure at health facilities.
- Encourage timely care-seeking for those with fever and ensure national and local guidance for COVID-19 accounts for the critical need for potential malaria patients to receive prompt diagnosis and treatment, as late diagnosis and treatment of malaria can be fatal.⁵
- Provide malaria testing for suspected malaria cases.⁶ Testing should emphasize the use of RDTs, as these tests allow for simple procedures, limited person-to-person contact and rapid results. To facilitate patient flow in health facilities and ensure physical distancing, testing could be conducted in a special area away from other patients and done by staff using appropriate protective measures. Tests could be done early in the patient flow such that results are available by the time of health worker–patient contact. For case management in communities, CHWs should take recommended precautions and engage clients away from other community members.
- Ensure there is appropriate evaluation of other possible causes of fever as per national guidelines (i.e., supporting integrated facility or community-based case management), potentially including COVID-19.
- Provide appropriate treatment of confirmed malaria cases using nationally recommended treatment regimens and supportive care.
- Providers must bear in mind that malaria can present along with COVID-19, and this should be taken into account as per national and local guidelines.

Additional recommendations specific to care-seeking and health facility management are provided below.

Programmes should continue to encourage the general population to seek care for fever and suspected malaria. As learned during the Ebola outbreak, fear and distrust of the health system can negatively impact care-seeking. Furthermore, individuals may be aware through local media of COVID-19 recommendations from early on in the pandemic when people were told to stay home if they were experiencing mild fever or non-severe symptoms. Malaria programmes should anticipate that families and individuals may be reluctant to risk potential COVID-19 exposure when they are sick. To prevent a spike in severe malaria cases and deaths resulting from delayed care-seeking during the upcoming malaria transmission season, national and local programmes should refine messaging around prompt care-seeking. Updated messaging should be responsive to physical distancing guidelines in line with local policies, context, and cultural and community norms.

5. Some early recommendations for COVID-19 suggested that those with mild fever and no severe disease should stay at home and only seek care if their disease progressed; this advice runs counter to recommendations for early care-seeking for malaria treatment – a recommendation that saves lives.

6. In contrast to an Ebola outbreak in which any exposure to blood presents an important risk for disease spread, the exposure to blood is not a recognized risk factor for COVID-19 infection and the addition of testing to the health worker–patient encounter should be managed using existing preventive measures (e.g., personal protection, handwashing and wearing gloves) to reduce COVID-19 transmission.

Care-seeking in health facilities and in communities should be met with standard health worker practices to prevent COVID-19 transmission (7). NMCPs and district programmes may develop standard operating procedures (SOPs) to specifically guide: i) health worker and patient contact practices; ii) testing decision algorithms based on the local risk of malaria, COVID-19 and other causes of fever, and the constellation of presenting symptoms; and iii) triaging or treatment/management of individuals based on test results and the symptom complex. SBCC experts should be involved in these discussions and in developing community-informed, culturally sensitive messaging.

CHEMOPREVENTION

Objective: Ensure the delivery of existing programmes involving the preventive use of antimalarial drugs among target populations, with a focus on pregnant women (delivering IPTp), children under 5 years of age in areas of highly seasonal malaria transmission (delivering SMC), and infants (delivering IPTi). (Guidance from MoHs in countries may supersede this general guidance on the preventive use of antimalarial drugs.)

Malaria in pregnancy (MIP)

Programmes should proceed with the recommended delivery of interventions to prevent malaria in pregnancy, including IPTp and ITNs, as per national malaria strategic plans, as these are life-saving interventions for newborns and infants. (N.B., It is unknown at this time whether pregnant or breastfeeding women have increased risk for or from COVID-19 infection (17).)

Maintain quality MIP services in ANCs, including the provision of ITNs and IPTp (the former at the first ANC visit and the latter at all recommended contacts after the first trimester), and prompt diagnosis with RDTs and treatment with ACTs in many of the countries in sub-Saharan Africa. Routine ANC services, including MIP services, should be continued based on national guidelines. Countries should consider each step of ANC and MIP services in the context of following COVID-19 safety precautions, including physical distancing, washing hands and using PPE. Additional considerations include the following:

- To the degree possible, pregnant women coming for ANC/delivery should wait and be seen in a different area from potential COVID-19 patients.
- Supplies of sulfadoxine-pyrimethamine (SP) for IPTp should be assured in all ANCs across countries so that no stockouts disrupt the IPTp services.
- Consider how to provide IPTp as directly observed treatment (DOT) and whether providers or clients need to take any steps to modify this approach to ensure physical distancing and safety (e.g., not reusing cups for DOT).
- Provision of an ITN at the first ANC visit should continue to be assured in all ANCs, ensuring that stock is available as per national guidelines.
- Pregnant women who experience a febrile illness or suspected malaria should be strongly encouraged to seek care and be tested for malaria (and other potential causes of the fever if needed, including COVID-19 if recommended).

- With a positive RDT result, pregnant women should receive appropriate case management, but providers must bear in mind that malaria can present along with COVID-19. This should be taken into account as per national and local guidelines. For women presenting with no danger signs, all elements of ANC should be carried out as usual.
- As with all other preventive and curative health services, the health workforce and the pregnant women should be appropriately protected, as they may face potential risk of COVID-19 exposure when providing or seeking care.

Seasonal malaria chemoprevention (SMC)

SMC is an effective life-saving intervention (18) that should proceed where planned in the national malaria strategic plan. Expansion of SMC to additional geographies, expanded age groups or extended time intervals should only be considered where commodities, planning, training and supervision are in place.

Certain countries may have SMC campaigns planned for the upcoming high malaria transmission season in the Sahel region. SMC is an important intervention for reducing malaria in children 3–59 months in this region, and this core intervention should proceed where planned. (N.B., Local guidance from the national MoH may supersede this guidance.)

Currently planned and supplied SMC programmes are encouraged to proceed according to their present schedule (i.e., driven by the timing of the rainy/transmission season). All necessary supplies and commodities should be assembled at the points of delivery as soon as possible. Messaging in the communities should be reviewed and adjusted to address local concerns and questions about how the campaigns will be managed to deliver the rounds of treatment while limiting exposure of health workers and families.

Some national programmes have already planned to expand SMC for their 2020 campaign, either to additional geographic regions or to an extended age range. As expansions usually require additional start-up capacity (e.g., additional planning, additional drugs, other supplies, and training of additional staff and supervisors), the proposed expansion should consider the local context. For example, the local health workforce may be over-extended, but other implementing partners may be able to step in rapidly to accomplish the task. If limiting features prevail, national programmes may need to postpone their current plans for SMC expansion. However, if the planning has been completed, the commodities are available, and training and supervision are already in place, national programmes could proceed with the planned expansion. As SMC is typically delivered through a community health platform with workers going house to house to distribute monthly doses of sulfadoxine-pyrimethamine plus amodiaquine (SP+AQ), concerns about CHW safety and the needed protective measures mentioned above also apply to SMC delivery.

- Daily reminders should be sent to all distribution teams to wash their hands frequently with soap and water, avoid touching their face, mouth, nose and eyes, seek care if feeling sick, and avoid physical contact (handshakes, fist bumps).
- Morning health checks should be reinforced for all distributors, adding temperature checks where feasible.
- All SMC campaign activities – e.g., training, registration, SBCC activities, fixed-site distribution, etc. – should be organized in a manner that minimizes the

gathering of people (keeping 2 metres apart and limiting groups to 10 people), and participants should use available precautions for personal protection (e.g., soap and water for handwashing, alcohol-based hand sanitizer if possible, masks for health personnel, good respiratory hygiene practices, etc.).

- Some campaign activities could expose workers and the public to COVID-19; countries should consider all opportunities to minimize risk of exposure, especially if the activities might not be truly essential (e.g., consider approaches for distribution that minimize person-to-person exposure). However, maintaining and increasing malaria protection remains essential across the targeted populations. Strategies for administering the first dose of SP+AQ via DOT may need to be adapted; for example, the caregiver could be instructed on how to administer the medicine and give the first dose in the presence of the distributor.

Intermittent preventive treatment in infants (IPTi)

As per national malaria strategic plans, recommended delivery of services for IPTi as part of the Expanded Programme on Immunization (EPI) should proceed, as these are life-saving interventions.

Maintaining quality IPTi services as part of the EPI should continue, using the same overall precautions used to effectively deliver the EPI vaccines.

EXTRAORDINARY INTERVENTIONS

As circumstances evolve during the COVID-19 pandemic, national programmes may be faced with diverse reasons for invoking strategies to clear malaria from populations. For example, malaria burden could increase dramatically if routine services are brought to a standstill, or evidence may become available that demonstrates malaria to be a specific risk factor for COVID-19 severe disease and death. During these or other such events, extraordinary measures could be considered (see technical guidance (19)). These could include the following:

Presumptive treatment of fever

Presumptive malaria treatment refers to treatment of suspected malaria cases without the benefit of diagnostic confirmation (e.g., by RDT). Under normal circumstances, the management of fever cases includes a diagnostic test for confirmation of the malaria infection followed by recommended treatment. Under the exceptional situations that may arise in the context of the COVID-19 pandemic, reverting to presumptive treatment of fever with antimalarials may be the only available option. Triggers for such an action may include:

- RDT stockouts due to supply chain disruptions: In the absence of a point-of-care diagnostic, it may be necessary to assume that fever cases are associated with malaria, and all febrile individuals should receive antimalarial treatment. Given that COVID-19 also leads to fever, these individuals should also be assessed for possible COVID-19 illness;
- non-availability of health workers who would normally perform the malaria testing, or lack of access to health facilities.

When considering this exceptional measure, the impact on supplies of malaria medicines should be taken into account. Standard practice involving pre-treatment parasitological diagnosis should be resumed as soon as circumstances permit.

Mass drug administration (MDA)

MDA is a WHO-recommended approach for rapidly reducing malaria mortality and morbidity during epidemics and in complex emergency settings. Through MDA, all individuals in a targeted population (either geographically or in a given age group) are given antimalarial medicines – often at repeated intervals – regardless of whether or not they show symptoms of the disease.

In exceptional circumstances, MDA has the potential to reduce disease and death and thus reduce the pressure on the health system. MDA has the dual benefit of clearing infections in the population and providing an interval of prophylaxis that serves to prevent infection and reduce malaria transmission. While MDA is not generally recommended in stable malaria-endemic populations, the COVID-19 pandemic could lead to national programmes needing to mitigate the malaria burden in populations.

Careful consideration will be required to ensure that the necessary supplies, logistics, training and supervision are in place and that the benefits outweigh any added risk of burdening the health system and putting health workers and the population at risk. Health workers providing MDA services should take recommended precautions to reduce their risk of exposure to COVID-19.

Possible COVID-19 treatment and the use of chloroquine (CQ) and hydroxychloroquine (HCQ)

Anecdotally, chloroquine (CQ) and hydroxychloroquine (HCQ) are already being used off-label to treat COVID-19 in many countries. Initial in vitro evaluations of the effect of CQ or HCQ on COVID-19 have led to a number of clinical trials that are currently underway to study treatment and prevention options in humans. However, there are currently insufficient data to inform guidance around the use of CQ or HCQ for COVID-19 treatment (20). Health care providers should be aware that CQ or HCQ at high doses can be toxic and life-threatening. WHO, the Global Fund to Fight AIDS, Tuberculosis and Malaria, the U.S. President's Malaria Initiative (PMI), Medicines for Malaria Venture, Bill & Melinda Gates Foundation and others in the global malaria community are monitoring these developments closely and will provide additional updates and guidance as they become available.

It is important to note that because of the possibility of increased demand for CQ, countries with endemic *P. vivax* infection are encouraged to procure and stock adequate CQ supplies for their case management of *P. vivax* infections.

The role of health structures, systems and staff for cohesive operations

Four critical supportive structures should be emphasized to assure quality services:

- 1. Programme management including training and supervision:** NMCPs, regional/provincial leadership and district leadership are responsible for providing overarching planning, training, supervision and monitoring of programme actions. This work should continue unabated where possible; however, some aspects may be compromised by limits placed on people assembling. In the event of such measures, remote work and communication should be supported to address all possible work aspects. Most of the systems should be in place for reinforcing the currently recommended interventions, but it may be hard to introduce new or expanded strategies if it is challenging to assemble for training and supervision. In the event that health facilities are specifically constrained in their ability to provide services, the planning and management teams may consider exceptional strategies for service delivery (e.g., expanded community outreach, mobile services, etc.) or special population-wide services (see comments on MDA). In particular, NMCPs should make all efforts to connect one or more staff persons to the national COVID-19 team in order to provide input on the overall strategy supporting both COVID-19 and malaria work and communicate back to the NMCP.

Procurement, supply and logistics systems are absolutely critical to assure that the right quantities of needed commodities and equipment are in the right place at the right time – i.e., at the patient care sites and prior to the rainy/transmission seasons. All efforts should be made to get all available in-country supplies to these points of care. The Supplies and Commodities Workstream will provide more detailed input, but a few suggestions are offered below.

COVID-19 is disrupting global supply chains. Both the production of key malaria commodities and logistics are being impacted. Global partners are working hard to manage these disruptions across commodities and countries, including providing visibility on specific order delays and broader supply risks as they develop. To support these efforts, countries should:

- place currently financed and planned orders for 2020 as early as possible (taking advantage of the flexibilities offered by major financiers such as the Global Fund (21), Gavi, the Vaccine Alliance (22), the World Bank (23) and others);
- adjust supply plans for longer lead times, at least one to two months, and keep track of these procurement and delivery timelines;

- track accurate inventory and consumption data in a timely manner to respond to urgent demand; contingency stocks may be required, as needs will change if extraordinary measures are required;
- work with national importation systems to assure timely clearance of all commodities.

As countries work to stem the spread of COVID-19, many are implementing travel and movement restrictions that could impact the internal movement of people and products. As such, in-country supply chains should consider the following:

- Increase the resupply quantities distributed to health facilities in case there are disruptions to internal transportation. Countries must consider the facility storage capacity and the need to ensure that key malaria commodities are available if transportation is disrupted. If storage is not available at the health facility level, consider storing products closer to health facilities, e.g., at the district level.
- While transportation is operational, consider more frequent distribution of core malaria commodities to facilities.
- Consider mobilizing in-kind contributions of private-sector-supplied warehousing for incoming shipments of long-lasting insecticidal nets (LLINs) to free up funds for intensified last-mile distribution activities.
- Prepare to adjust to the possibly increased cadence at which SMC and LLIN campaign roll-outs will take place.

2. Surveillance and information systems that count, document and track suspected and confirmed cases, severe illness, deaths and intervention coverage in populations should be supported and strengthened where possible, including considering innovative digital platforms where they have already been launched. Prompt counting, reporting and sharing of data on COVID-19 has been critical to helping understand its movement in populations; similar practices should be upheld for the counting, reporting and sharing of data on malaria and other key diseases in the communities. Some initial basic recommendations for information include the following:

- For malaria, standard reports should include suspected cases, tested cases, confirmed cases, severe cases (based on severity definition or hospitalization) and deaths.
- For COVID-19, a similar set of parameters should be documented (and other aspects could be measured to address additional questions regarding this new infection/disease).
- Rapid/timely communication of this information and analyses and summaries should be made available across the national system and with all partners in order to foster the sharing of quality information during this complex time.
- Because data-sharing often involves health and statistics staff assembling to review data, these efforts should be made as safe as possible, perhaps with virtual meetings and telephone or Internet communications to limit interpersonal contact.
- Operational research and programme evaluations that are not critical and time-sensitive should be deferred until a later date when they can be conducted without excess risk to the field workers and study populations. Field studies to address specific aspects of interactions between malaria and COVID-19 infections may need to be conducted; these questions should be generated and addressed as early as feasible.

3. Communication and community engagement approaches and systems should be supported to deliver and support good public health practices among communities, households and individuals. NMCPs and district health programmes should engage their SBCC teams and with national and local communication networks to shape and disseminate factual, relevant, thoughtful messages to support all health programme actions and avoid contradictory messages. Approaches to SBCC for malaria include community meetings (taking into account national guidance on limiting the number of people converging at one time and maintaining proper distance) and one-on-one household visits (respecting personal protection distances, e.g., 2 metres between persons). The use of social networking platforms, e.g., SMS messages, should also be explored. Such activities will need to be modified to ensure the protection of both community members and facilitators. All messaging and materials should be adapted in collaboration with COVID-19 SBCC considerations and concerns. Broadly, it is recommended that:

- The promotion of malaria prevention and treatment behaviours should continue in order to prevent an upsurge in malaria morbidity and mortality. Given prevailing guidance around physical distancing, malaria SBCC efforts should be redirected to mass and mid-media channels (radio, television, social media, posters, billboards, town announcers, megaphones, etc.) whenever possible.
- Planned social mobilization and interpersonal communication activities, such as household visits and small group meetings, which are likely to put individuals in close proximity to one another may need to be temporarily curtailed in favour of mass and mid-media approaches. In some circumstances where these local activities are conducted by members of the local community, it may be appropriate to continue this engagement as long as physical distancing is practiced. This is particularly the case when these activities are paired with life-saving interventions such as mass ITN distributions, SMC campaigns or IRS programmes.
- Behavioural data collection efforts that involve household visits or small group meetings (focus groups, Malaria Behaviour Surveys, Knowledge, Attitudes, and Practice Surveys, etc.) should be put on hold at this time and reassessed at a later date as the COVID-19 pandemic evolves. Decisions to move forward with behavioural data collection efforts at a later date should take into account any updated international, national and local guidance on COVID-19. The first priority when making a decision about whether or not to move forward with a planned data collection activity should be the safety of the data collectors, households and participants.
- Malaria prevention and treatment messaging should be responsive to the known COVID-19 situation in the country. Shifts in key malaria prevention and treatment behaviours are not recommended at this time. However, malaria SBCC messaging should be adapted to reflect behavioural considerations related to COVID-19. For instance, messaging that promotes prompt care-seeking for fever should also highlight the importance of handwashing and physical distancing when visiting a health facility. Similarly, clear, direct explanations about changes that beneficiaries might experience as a result of COVID-19, such as increased use of PPE in health facilities, will be critical to ensuring continued trust in the health system and preventing the spread of rumours.

4. Advocacy: Malaria programmes may face challenges in justifying why it is important for malaria activities to continue. It is important for national programmes to be engaged in the discussions around the COVID-19 response and be prepared with key messages. These messages could include:

- information on the malaria burden and potential risks of discontinuing key activities (such as campaigns);
- the potential additional burden of malaria patients on a health system stretched from addressing COVID-19 should malaria services cease;
- key strategies the programme is considering for mitigating the potential spread of COVID-19 through malaria activities (from the above recommendations, other malaria/COVID-19 guidance and/or national/local discussions).

References

1. Critical preparedness, readiness and response actions for COVID-19. Geneva: World Health Organization; 2020 (WHO/2019-nCoV/Community_Actions/2020.3; <https://www.who.int/publications-detail/critical-preparedness-readiness-and-response-actions-for-covid-19>).
2. Coronavirus disease (COVID-19) outbreak: rights, roles and responsibilities of health workers, including key considerations for occupational safety and health. Geneva: World Health Organization; 2020 (WHO/2019-nCoV/HCW_advice/2020.2; [https://www.who.int/publications-detail/coronavirus-disease-\(covid-19\)-outbreak-rights-roles-and-responsibilities-of-health-workers-including-key-considerations-for-occupational-safety-and-health](https://www.who.int/publications-detail/coronavirus-disease-(covid-19)-outbreak-rights-roles-and-responsibilities-of-health-workers-including-key-considerations-for-occupational-safety-and-health)).
3. Coronavirus disease (COVID-19) advice for the public [website]. Geneva: World Health Organization; 2020 (<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>).
4. Considerations for distribution of insecticide-treated nets (ITNs) amid COVID-19 concerns and in COVID-19 affected countries. Geneva: Alliance for Malaria Prevention; 2020 (<https://allianceformalariaprevention.com/about/amp-guidelines-and-statements/>).
5. Coronavirus disease (COVID-19) technical guidance: infection prevention and control / WASH [website]. Geneva: World Health Organization; 2020 (<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/infection-prevention-and-control>).
6. Coronavirus disease (COVID-19) situation dashboard [website]. Geneva: World Health Organization; 2020 (<https://experience.arcgis.com/experience/685d0ace521648f8a5beeeee1b9125cd>).
7. Responding to community spread of COVID-19. Geneva: World Health Organization; 2020 (WHO/COVID-19/Community_Transmission/2020.1; <https://www.who.int/publications-detail/responding-to-community-spread-of-covid-19>).
8. Coronavirus disease (COVID-19) pandemic [website]. Geneva: World Health Organization; 2020 (<https://www.who.int/emergencies/diseases/novel-coronavirus-2019>).
9. Hennessee I, Guilavogui T, Camara A, Halsey ES, Marston B, McFarland D, et al. Adherence to Ebola-specific malaria case management guidelines at health facilities in Guinea during the West African Ebola epidemic. *Malar J*. 2018;17:230. doi:10.1186/s12936-018-2377-3.
10. Plucinski MM, Guilavogui T, Sidikiba S, Diakité N, Diakité S, Dioubaté M, et al. Effect of the Ebola-virus-disease epidemic on malaria case management in Guinea, 2014: a cross-sectional survey of health facilities. *Lancet Infect Dis*. 2015;15(9):1017–23. doi:10.1016/S1473-3099(15)00061-4.
11. Kuehne A, Tiffany A, Lasry E, Janssens M, Besse C, Okonta C, et al. Impact and lessons learned from mass drug administration of malaria chemoprevention during the Ebola outbreak in Monrovia, Liberia, 2014. *PLoS One*. 2016;11(8):e0161311. doi:10.1371/journal.pone.0161311.

12. Kolie D, Camara BS, Delamou A, Béavogui AH, Hermans V, Edwards JK, et al. The Ebola-effect in Guinea 2014-15: tangled trends of malaria care in children under-five. *PLoS One*. 2018;13(2):e0192798. doi:10.1371/journal.pone.0192798.
13. Wagenaar BH, Augusto O, Beste J, Toomay SJ, Wickett E, Dunbar N, et al. The 2014-2015 Ebola virus disease outbreak and primary healthcare delivery in Liberia: time-series analyses for 2010-2016. *PLoS Med*. 2018;15(2):e1002508. doi:10.1371/journal.pmed.1002508.
14. Walker PG, White MT, Griffin JT, Reynolds A, Ferguson NM, Ghani AC. Malaria morbidity and mortality in Ebola-affected countries caused by decreased health-care capacity, and the potential effect of mitigation strategies: a modelling analysis. *Lancet Infect Dis*. 2015;15:825-32. doi:10.1016/S1473-3099(15)70124-6.
15. Wang J, Xu C, Wong YK, He Y, Adegnik AA, Kremsner PG, et al. Preparedness is essential for malaria-endemic regions during the COVID-19 pandemic. *Lancet*. 2020;395:1094-6. doi:10.1016/S0140-6736(20)30561-4.
16. Operational considerations for case management of COVID-19 in health facility and community. Geneva: World Health Organization; 2020 (WHO/2019-nCoV/HCF_operations/2020.1; <https://www.who.int/publications-detail/operational-considerations-for-case-management-of-covid-19-in-health-facility-and-community>).
17. Pregnancy and breastfeeding FAQs: information about coronavirus disease 2019 [website]. Atlanta: Centers for Disease Control and Prevention; 2020 (<https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/pregnancy-breastfeeding.html>).
18. Seasonal malaria chemoprevention [website]. Geneva: World Health Organization; 2017 (https://www.who.int/malaria/areas/preventive_therapies/children/en/).
19. Country & technical guidance – coronavirus disease (COVID-19) [website]. Geneva: World Health Organization; 2020 (<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance>).
20. Touret F, de Lamballerie X. Of chloroquine and COVID-19. *Antiviral Res*. 2020;177:104762. doi:10.1016/j.antiviral.2020.104762.
21. Global Fund supports countries in response to COVID-19 [website]. Geneva: Global Fund to Fight AIDS, Tuberculosis and Malaria; 2020 (<https://www.theglobalfund.org/en/updates/other-updates/2020-03-23-global-fund-supports-countries-in-response-to-covid-19/>).
22. Gavi Board calls for bold engagement to respond to COVID-19 [website]. Geneva: Gavi, the Vaccine Alliance; 2020 (<https://www.gavi.org/news/media-room/gavi-board-calls-bold-engagement-respond-covid-19>).
23. World Bank Group and COVID-19 (coronavirus) [website]. Geneva: World Health Organization; 2020 (<https://www.worldbank.org/en/who-we-are/news/coronavirus-covid19>).

For further information please contact:

Global Malaria Programme
World Health Organization

20, avenue Appia
CH-1211 Geneva 27
Switzerland

Email: infogmp@who.int