



Status of Malaria in the World Health Organization Eastern Mediterranean Region

Arvind Nath, MD, MPH¹

¹ Scientist 'E', Indian Council of Medical Research - National Institute of Malaria Research, New Delhi, India.

ABSTRACT

Background: Malaria continues to affect some of the countries of the World Health Organization (WHO) Eastern Mediterranean Region (EMRO). **Objective:** To describe the status of Malaria in each country of the WHO Eastern Mediterranean Region and to find out how far each country was from the stage of elimination of the disease. **Method:** The methods included online searches related to Malaria for each country such as from WHO, World Bank and journal articles as well as national program documents. Year of certification of malaria elimination was derived from the WHO global malaria program information. **Results:** Fourteen countries (Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, Syria, Tunisia, and United Arab Emirates) are free of indigenous Malaria while the remaining eight countries (Afghanistan, Djibouti, Iran, Pakistan, Saudi Arabia, Somalia, Sudan, and Yemen) are progressing towards that target. **Conclusion:** Iran and Saudi Arabia are most likely to receive certification of Malaria elimination in the immediate future.

Submission Date:

2022-10-18

Revision Date:

2023-01-16

Acceptance Date:

2023-01-30

Key Words:

Malaria, WHO, EMRO.

INTRODUCTION

Malaria is a disease of humans caused by *Plasmodium* species and transmitted by the bite of the female *Anopheles* mosquito. According to the World Malaria Report 2021, there were approximately 241 million cases of malaria in 2020 from 65 Malaria-endemic countries.¹

The World Health Organization (WHO) Eastern Mediterranean Region (EMRO) includes² the following twenty-two countries: Afghanistan, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates and Yemen (Figure 1). The rationale for this review is that so far, no study has been made of the comparison of the status of Malaria in the countries of the WHO Eastern Mediterranean Region. This study is an attempt in that direction.

The objectives of the study were to describe the status of Malaria in each country of the WHO Eastern

Mediterranean Region and to find out how far each country was from the stage of elimination of the disease.

METHOD

The study design included online searches related to Malaria. These online searches were done for each country of the WHO EMRO. The websites which were chosen were those of the WHO, the World Bank, journal articles, national program documents, and in few cases newspaper reports. As the last two sources of information were available only on the websites, their weblinks were taken as the references for the information on Malaria related to each of these countries. The most up to date references were selected as part of the online searches. Year of certification of malaria elimination was derived from the WHO global malaria program information.³

Corresponding Author: Arvind Nath, ¹ Scientist 'E', Indian Council of Medical Research - National Institute of Malaria Research, New Delhi, India. Email: natha.hq@icmr.gov.in

RESULTS

According to the available data on Malaria, the countries were divided into two parts. Those countries



Figure (1): Map of WHO's Eastern Mediterranean Region

certified by WHO to have eliminated Malaria were given in Table 1 and those who have not yet been certified by WHO to have eliminated Malaria were given in Table 2. Here are the status of included country;

Afghanistan: The Annual Parasite Incidence (API) of Malaria for Afghanistan during 2020 was 8.4 per 1000 population at risk.⁴ As per another reference, during 2020, there were 101,170 cases of Malaria reported in Afghanistan.⁵ In Afghanistan, 95% of Malaria cases are due *Plasmodium falciparum* while 5% are caused by *Plasmodium vivax*. In Afghanistan, there are 34 provinces. During 2017, 91% of the *Plasmodium falciparum* and 89% of the *Plasmodium vivax* cases occurred in 6 provinces alone. These 6 provinces are: Nangahar, Nuristan, Laghman, Khost, Kunar, and Pakitika. These 6 provinces are found close together and located in the eastern part of the country.⁶

Djibouti: During 2017, there were 14810 cases of Malaria in the country which rose to 73535 cases in 2020.⁷ The incidence of Malaria ranged between 2 per 1000 and 4 per 1000 from 2000 to 2013. Suddenly from 2013 onwards, there was an upward spurt in the number of Malaria cases with the incidence reaching 20.7 per 1000 in 2017 and 97.6 per 1000 in 2020.⁸

Egypt: Egypt has eliminated Malaria and the last indigenous case was in 1998. During May and June 2014, there were 19 reported cases of locally acquired *P. vivax* Malaria from Sudanese migrants in the Aswan governate.⁹

Iran: Iran did not have any indigenous case of Malaria during 2018 or 2019. During 2017, it reported only 57 imported Malaria cases.¹⁰

Iraq: Since 2009, Iraq has not had any case of indigenous Malaria.¹¹

Oman: There is no indigenous transmission of Malaria in Oman; only imported cases occur.¹²

Pakistan: As per one reference, during 2021, there were 350,467 reported confirmed cases of Malaria seen at governmental health facilities while 70,510 confirmed cases of the disease were reported from the private sector.¹³ According to another reference, there were 374,513 confirmed cases of Malaria in Pakistan during 2018. *Plasmodium vivax* caused 84% of these, *Plasmodium falciparum* caused 14.9% and 1.1% were due to a mixture of both species. The Annual Parasite Incidence (API) for the country was 1.7 per 1000 population at risk.¹⁴

Table (1): Countries of the WHO Eastern Mediterranean Region & their years of certification of malaria elimination granted by the WHO

Country	Year of Certification of Malaria Elimination
1. Bahrain	2012
2. Jordan	2012
3. Kuwait	1963
4. Lebanon	2012
5. Libya	2012
6. Morocco	2010
7. Qatar	2012
8. Tunisia	2012
9. United Arab Emirates	2007

*Year of certification of malaria elimination was derived from the WHO global malaria program information.³

Palestine: Malaria has been eliminated from Palestine.¹⁵

Saudi Arabia: There were 177 indigenous cases of Malaria during 2017 that occurred in two provinces that bordered Yemen which has a high incidence of the disease.¹⁶

Somalia: During 2020, Somalia reported 27,333 cases of Malaria.¹⁷ During the same year, the incidence of Malaria per 1000 population at risk was 52.2.¹⁸

Sudan: During 2020, Sudan reported 1,698,394 cases of Malaria.¹⁹ During the same year, the incidence of Malaria per 1000 population at risk was 73.4.²⁰

Syria: Since 2012, there is no indigenous transmission of Malaria in Syria.²¹

Yemen: The incidence of Malaria per thousand population in Yemen during 2020 was 40.6.²² During

2017, the country reported 114,004 cases of the disease of which 98% were due to *P. falciparum* and 1% due

Table (2): Countries of the WHO Eastern Mediterranean Region which are yet to be endorsed by WHO for Certification of Malaria Elimination

Country	Reference Year	API/ Number of Cases
Afghanistan	2020	8.4 per 1000
Djibouti	2020	97.6 per 1000
Egypt	2014	19 cases
Iran	2017	57 imported cases
Iraq	Since 2009	No cases
Oman	Current	Only imported cases
Pakistan	2018	374,513 cases
Palestine	Current	No cases
Saudi Arabia	2017	177 cases
Somalia	2020	27,333 cases
Sudan	2020	1,698,394 cases
Syria	Since 2012	No cases
Yemen	2020	40.6 per 1000

to *P. vivax*. There is a clustering of Malaria cases along the western and southern borders of the country.²³

DISCUSSION

Afghanistan and Pakistan are moderately placed regarding reaching the level of Malaria elimination. Afghanistan's National Malaria Strategic Plan from Malaria Control to Elimination 2018-2022 was developed in 2017 with the aim for the country to eliminate Malaria by 2030. In this plan, the country was divided into 3 categories based on the API and different interventions planned to be carried out in each category. These 3 categories were: (1) Transmission Reduction Phase, (2) Elimination Phase and (3) Prevention of Re-establishment Phase. The interventions include spraying, entomological surveillance, insecticide-resistance testing, and management of epidemics.²⁴ Pakistan has a Strategic Plan of the Malaria Control Program (2015-2020) in which the overall goal was to reduce, by 2020, the Malaria burden by 75% in the high and moderate endemic districts and to eliminate the disease in the low endemic districts.¹⁴ Also, the sub-objectives were: (1) To achieve <5 API in high endemic areas of Balochistan, Sindh, Khyber Pakhtunkhwa, and Tribal Districts by 2020. (2) To achieve <1% API within moderate endemic districts of Balochistan, Sindh,

Khyber Pakhtunkhwa, and Punjab by 2020. (3) To achieve Zero API within low endemic districts of Sindh, Khyber Pakhtunkhwa, and Punjab by 2020. Iran and Saudi Arabia are most likely to receive certification of Malaria elimination in the immediate future. Iran must maintain its zero indigenous-Malaria status for three years in a row to receive WHO certification of elimination of the disease.¹⁰ Saudi Arabia is presently in the pre-elimination to elimination stage of Malaria.²⁵

Several countries including Yemen, Djibouti, Somalia, and Sudan still have a long way to go to eliminate the disease. Yemen has the second highest incidence of the disease in the Middle East and accounts for 40% of hospital admissions in the peak Malaria months. In Yemen, severe Malaria in children puts a strain on the health services and the pattern is like that in Africa.²⁸ Djibouti aims to reduce Malaria occurrence by 50% as part of its National Health Development Plan by 2024 and reach zero indigenous cases of the disease by end of 2030.⁷ Somalia has carried out interventions such as distribution of Long-Lasting Insecticide-treated Nets and Indoor Residual Spraying to reduce the number of Malaria cases.²⁶ Sudan, in 2020, carried the heaviest burden of Malaria in the Eastern Mediterranean Region accounting for more than half (56%) of all cases and (61%) deaths.²⁷

CONCLUSION

Iran and Saudi Arabia are most likely to receive certification of Malaria elimination in the immediate future. Afghanistan and Pakistan are moderately placed regarding reaching the level of Malaria elimination. Djibouti, Somalia, Sudan, and Yemen still have a long way to go to eliminate the disease.

Ethical Approval

Not required since the study did not involve human or animal subjects.

Funding source: The authors did not receive any financial support related to this research.

Conflict of interest: The author has no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

REFERENCES

- World Health Organization 2021. World Malaria Report 2021. URL: <https://apps.who.int/iris/handle/10665/350147>
- Map of WHO Eastern Mediterranean Region. URL: [#">https://www.who.int/europe/home?v=welcom#](https://www.who.int/europe/home?v=welcom)
- World Health Organization. Global Malaria Programme. URL: <https://www.who.int/teams/global-malaria-programme/elimination/countries-and-territories-certified-malaria-free-by-who>
- World Bank 2020. Incidence of malaria in Afghanistan. URL: <https://data.worldbank.org/indicator/SH.MLR.INCD.P3?locations=AF>
- World Bank 2022. URL: Afghanistan - Malaria Cases Reported. URL: <https://tradingeconomics.com/afghanistan/malaria-cases-reported-wb-data.html>
- World Health Organization. Afghanistan. Malaria. URL: <https://www.emro.who.int/afg/programmes/malaria-leishmaniasis.html>
- United Nations Development Programme 2022. Djibouti World Malaria Day. URL: <https://www.undp.org/djibouti/news/world-malaria-day>
- World Bank 2020. Incidence of malaria in Djibouti. URL: <https://data.worldbank.org/indicator/SH.MLR.INCD.P3?locations=DJ>
- Centers for Disease Control & Prevention, Atlanta, USA. Malaria Outbreak in Egypt: Recommendations for Travelers. URL: https://www.cdc.gov/malaria/new_info/2014/malariaegypt.htm
- Bakhtiari, F. "Iran taking final step toward Malaria elimination" URL: <https://www.tehrantimes.com/news/447211/Iran-taking-final-step-toward-malaria-elimination>
- "Malaria disease in World and Iraq" <https://www.slideshare.net/ZheerSN/malaria-disease-in-world-and-iraq>
- World Health Organization. Eastern Mediterranean Regional Office. Oman, Malaria treatment policy. URL: <http://www.emro.who.int/omn/oman-news/malaria-treatment-policy.html>
- World Health Organization. Malaria 2021 Country Profile: Pakistan. URL: https://cdn.who.int/media/docs/default-source/malaria/country-profiles/2018/profile_pak_en.pdf?sfvrsn=4850fc5e_3&download=true
- Pakistan Malaria Annual Report 2019. Directorate of Malaria Control, Pakistan. URL: <https://www.dmc.gov.pk/wp-content/uploads/2022/07/Annual-Report-2019.pdf>
- Alexander A. What underscored successful malaria elimination in Palestine 100 years ago? Effective Education. Malaria world J. 2021. URL: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8415063/>
- World Health Organization 2018. Saudi Arabia recorded 177 indigenous malaria cases in 2017, a decrease of almost 100 cases from 2016. URL: <https://apps.who.int/iris/bitstream/handle/10665/272748/WHO-CDS-GMP-2018.11-Saudi-Arabia-eng.pdf?sequence=1&isAllowed=y>
- Malaria cases reported in Somalia during 2020. <https://tradingeconomics.com/somalia/malaria-cases-reported-wb-data.html>
- World Bank 2022. <https://data.worldbank.org/indicator/SH.MLR.INCD.P3?locations=SO>
- Malaria cases reported in Sudan during 2020. <https://tradingeconomics.com/sudan/malaria-cases-reported-wb-data.html>
- World Bank 2022. Incidence of malaria in Sudan. URL: <https://data.worldbank.org/indicator/SH.MLR.INCD.P3?locations=SD>
- World Health Organization. Eastern Mediterranean Regional Office. Malaria control and elimination. URL: <http://www.emro.who.int/malaria/strategy/>
- World Bank 2020. Incidence of malaria in Yemen, Rep. URL: <https://data.worldbank.org/indicator/SH.MLR.INCD.P3?locations=YE>
- World Health Organization. Malaria 2021 Country Profile: Yemen. https://cdn.who.int/media/docs/default-source/malaria/country-profiles/2018/profile_yem_en.pdf?sfvrsn=1250cccc_3&download=true
- Government of Afghanistan. Ministry of Public Health. National Strategic Plan "From Malaria Control to Elimination in Afghanistan" 2018-2022. <https://moph.gov.af/sites/default/files/2019-07/NMSP%202018-2020%20Final.pdf>
- Rina Tripathi, Hafiz A. Makeen, Ahmed A. Albarraq, Pankaj Tripathi, Abdulkarim M. Meraya, Amal A. Mubarak & Mashael E. Alfai (2020) A community-based survey of

- malaria and its prevention in Jazan, Saudi Arabia, *International Journal of Health Promotion and Education*, 58:1, 28-41. URL: <https://www.tandfonline.com/doi/abs/10.1080/14635240.2019.1665470>
26. Voice of America. <https://www.voanews.com/a/africa-authorities-somalia-hail-progress-malaria-fight/6205053.html>
27. World Health Organization. WHO congratulates Sudan on adopting the “High burden to high impact” approach. URL: <https://www.who.int/news/item/25-04-2022-who-congratulates-sudan-on-adopting-the-high-burden-to-high-impact-approach>
28. Kaiser Family Foundation. Malaria Among Children in Yemen Straining Country’s Health Services, Study Says. URL: <https://khn.org/morning-breakout/dro0040985/>

Cite this article as: Arvind Nath. Status of Malaria in the World Health Organization Eastern Mediterranean Region. *Egyptian Journal of Community Medicine*, 2023;41(3):202-206.
DOI10.21608/ejcm.2023.169486.1237