

a 61203

WORLD HEALTH
ORGANIZATION

ORGANISATION MONDIALE
DE LA SANTÉ

INTER-REGIONAL CONFERENCE ON MALARIA
FOR THE EASTERN MEDITERRANEAN AND
EUROPEAN REGIONS



WHO/Mal/1168 ✓
9 April 1956

ORIGINAL: ENGLISH

Provisional agenda item 3.5.2

THE PILGRIMAGE AND ITS IMPLICATIONS IN A REGIONAL
MALARIA ERADICATION PROGRAMME

by

Dr M. A. Farid
WHO Regional Malaria Adviser, EMRO

I. INTRODUCTION

The Islamic faith demands that Moslems, at least once in their lives and provided they can do so, should perform the pilgrimage to Mecca and participate in the mass demonstration taking place every year on the ninth day of the month of Zulhidga (Arabic lunar calendar) and the following days. This means that the date of the commencement of the pilgrimage is not fixed according to the Christian calendar, but falls each year on a date 11 days earlier than the preceding pilgrimage. Thus pilgrims are subjected, according to the date of the pilgrimage season, to a wide range of climatic conditions.

The pilgrimage procession can be summarized as follows:

1. The pilgrims arrive by land, sea or air. The principal receiving airport is in Jeddah town which is also the principal port on the Red Sea for the western coast of Saudi Arabia. Sometimes the pilgrims arrive one or two months before the pilgrimage season commences and take the opportunity of visiting the tomb of the Prophet in Medina town.
2. On the ninth day of the month of Zulhidga all pilgrims gather in the morning around the Mount of Mercy rising from the Plain of Arafat, situated 12 miles east of Mecca. In the evening the pilgrims move to the Mozdalifa site, four miles west of Arafat and camp there for the night.

Authors only are responsible for views expressed in signed papers of this series.

3. On the tenth day of Zulhidga, the pilgrims proceed to Mona, about two miles further west towards Mecca, and stay there for three days under tents erected in the sacred valleys, offering sacrifices of sheep, cows or camels.
4. On the thirteenth day of Zulhidga, the pilgrims move to Mecca to visit the Exalted Kaaba and drink the holy water of Zamzam well. Following this day, the pilgrimage ceremonies come to an end and the mass of pilgrims begins to break up and disperse. After a short sojourn in Mecca, Jeddah or Medina, the pilgrims return to their own countries usually by the same route and using the same means of transport.

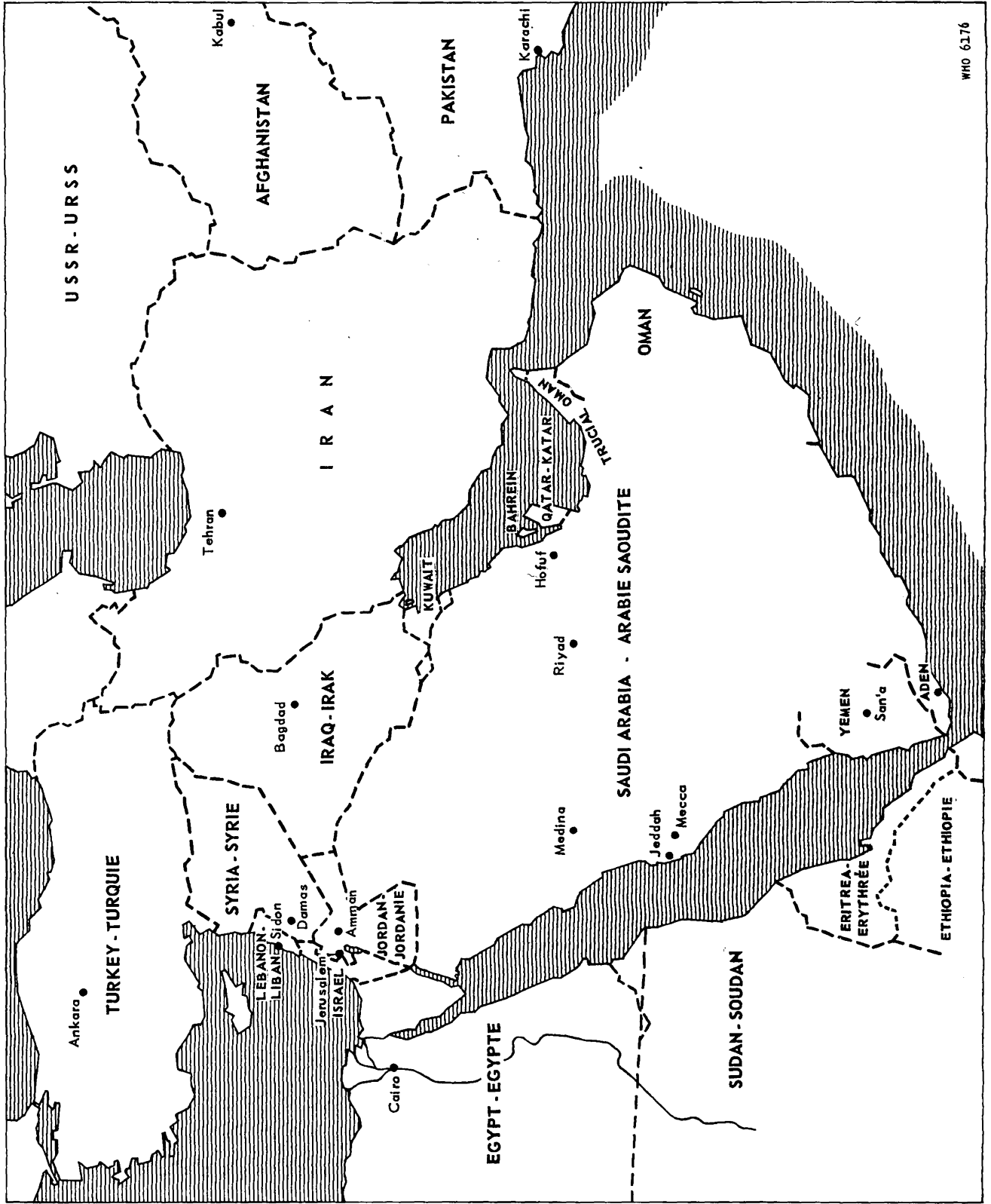
II. PUBLIC HEALTH DANGERS RELATED TO PILGRIMAGE

As the large majority of pilgrims are poor, or middle-class people, and as many of them are old and infirm, one can imagine the effect of such a rigorous and strenuous trip, the severe climatic conditions and the lack of environmental sanitation facilities on the well-being of the pilgrims. Even in the absence of epidemics, a high mortality rate is noted among them. In 1924, although the pilgrimage was declared free from infection, the mortality rate was 4 per cent. among the Egyptians and 22 per cent. among the Javanese.³ When the pilgrimage season occurs during the summer months, extending from April to November, heat-stroke alone kills hundreds of pilgrims. In the 1950 pilgrimage, 153 deaths were recorded in one day at Mona, most of which were attributed to heat-stroke.

Germs of pestilential diseases are liable to be carried by the mass of pilgrims numbering sometimes half a million, and this has always been a potential source of severe epidemics, afflicting not only the pilgrims but also spreading to their countries of origin. The spread of cholera due to the Mecca pilgrimage in the middle of the nineteenth century was the first alarm, and led to international agreements regarding the provisions of the "International Sanitary Regulations relating to Pilgrimage". These sanitary regulations have been under constant review since the first International Health Conference held in Paris in 1851. The latest regulations* adopted by the World Health Assembly in 1951 are mainly

* Wld Hlth Org. techn. Rep. Ser. 41

SAUDI ARABIA AND THE NEIGHBOURING COUNTRIES - ARABIE SAOUDITE ET PAYS VOISINS



concerned with the sanitary provisions relating to each of the six quarantinable diseases, namely: plague, cholera, yellow fever, smallpox, typhus and relapsing fever.

Malaria, dysentery, dengue, sand-fly fever, and the typhoid-paratyphoid group of fevers have always been common amongst returning pilgrims, but being indigenous diseases of their countries of origin, they were not considered in the International Sanitary Regulations. The Egyptian Medical Mission attached to the Egyptian pilgrims, and offering medical services to all other nationalities, noted that in the 1947 pilgrimage, malaria was one of the most common diseases treated by the Mission in Mecca.

III. MALARIA STATUS IN THE JEDDAH-MECCA-MEDINA TRIANGLE

1. History

Malaria has been prevalent in Saudi Arabia since the pre-Islamic era and was known as the oasis fever or Yethrib fever (Yethrib being the old name of Medina town).² After the Prophet Mohammed emigrated to Medina from Mecca, July 622 AD, an epidemic of malaria spread amongst his followers who had gone with him. On his first pilgrimage to Mecca, after his emigration, the Prophet urged his followers to hurry their steps and show their strength while circling the Kaaba, thereby disappointing their opponents who were wishfully thinking that Yethrib fever had exhausted them.

2. Topographical and climatological features

The three towns are located on the western coast of Saudi Arabia, Jeddah being the principal port on the Red Sea, while the two others are inland cities lying in the Hedjaz mountainous range rising to 8000 feet behind Mecca and 3000 feet near Medina. Two good macadamized roads connect the three cities; the one joining Jeddah to Mecca runs east for about 84 kms, while the other joining Jeddah to Medina is about 500 kms long, and runs northward along the coast for almost half the distance. The Hedjaz mountainous range between

Mecca and Medina is criss-crossed by many inter-communicating valleys that receive occasional torrential rains during the rainy season which lasts from October to May. These rains run a westerly course towards the sea, thus flooding the coastal plain. Wadi Fatma valley, lying halfway between Jeddah and Mecca and extending in a north-easterly direction through the Hedjaz mountains, joins up with the other valleys, thereby forming an inland route between Mecca and Medina. These valleys, especially Wadi Fatma, have numerous springs and a profuse underground water supply which support a series of scattered rural settlements (oases). The rains are rather erratic in timing, but are usually heavy, averaging from about three to four inches. This average precipitation may fall in three or four showers usually in December, although in May the heaviest rain of the year sometimes falls. The summer weather in Jeddah is fierce, reaching, during the day, a temperature of 100° F and 85 per cent. relative humidity, while during the winter, the temperature seldom falls below 54° F. In the highlands the summer weather may reach 115° and 10 per cent. relative humidity, while at an elevation of 3000 to 5000 feet one may get freezing weather.

3. Malaria vectors

Anopheles gambiae has been reported in all the three towns, in Wadi Fatma valley and the other valleys between Medina and Mecca, in valleys along the coastal plain south of Jeddah to Jizan, near Yemen, and north of it in Yanboo village, 200 kms north of Jeddah. A. gambiae breeds all the year round in springs and their channels, and in dug-out wells in the valley courses where underground water is not deep. In the towns it breeds in rain cisterns, roof reservoirs and pools of surface water, etc. Extensive gambiae breeding occurring in the residual pools left after torrential rain, leads to explosive outbreaks of malaria in both the towns and oases. A. gambiae shows domestic habits and is still vulnerable to DDT residual spraying.

A. sergenti is another important vector in Medina and in the village settlements (oases) in the valleys. It maintains a high degree of malaria endemicity among the indigenous inhabitants, reaching sometimes epidemic levels, especially when irrigation schemes are extended or when an influx of non-immune inhabitants comes to live near these places. A. sergenti breeds all the year round, but its optimum breeding occurs in the autumn and throughout the winter months. It is a wild mosquito, that bites in the open, and can use natural caves and fissures in neighbouring hills as daytime resting places.

A. sergenti can be considered as the main malaria vector of the northern half of Arabia, and pilgrims reaching Mecca by land from Jordan, Syria, Iraq and Iran and on their way spending nights in these villages are subject to malaria transmission by this efficient vector. Pilgrims, especially those coming from Iran, Pakistan, Afghanistan or India, who hit the eastern coast of Arabia on the Persian Gulf, on their way to Mecca, are subject to malaria transmitted by A. stephensi which is the main vector in Al-Hasa province, but when they pass through the villages of the central plateau, A. sergenti comes into operation. It may be of interest to note that recent investigations showed that in Al-Hasa province, A. stephensi is now becoming resistant to DDT after four rounds of residual spraying carried out in the period 1950-1955.⁴ Under these circumstances, the pilgrims from northern countries, travelling through Saudi Arabia by inland routes, especially during the malaria transmission season, extending from October to May, will be liable to infection before reaching Mecca.

4. Malarionetric surveys of Jeddah

Buxton,¹ in a paper published in 1944, noted that malaria was evidently quite a serious problem. Cases diagnosed on clinical evidence as malaria, formed 45 per cent. of all out-patients at the Government hospital in 1935, and the British Legation dispensary reported a rate of 25 to 40 per cent. among the 40 000 people who attended the dispensary in the years 1931 to 1935. Towards the end of 1950 and the beginning of 1951, an epidemic of malaria hit the

inhabitants of Jeddah and during the period 9 December 1950 to 11 February 1951, the Government's hospital treated 3717 cases of malaria diagnosed on clinical evidence. The agreement between the Government and the World Health Organization in October 1952, led to the establishment of a malaria control project to protect the inhabitants of Jeddah, Wadi Fatma and Mecca. This project is still continuing its services and has succeeded in controlling malaria in Jeddah by larvicidal operations. During February 1956, a splenic survey made of 620 Jeddah schoolchildren in the age group 7-12 years, showed a splenic rate of four per cent. and an average splenic enlargement of 1.08 per cent.

5. Malariometric surveys of Wadi Fatma

In December 1952, a pre-operational survey was made in a number of villages and the results showed splenic rates ranging between 42 and 81, and parasitic rates between 5 and 31 per cent. (total number of children in age group 7-12 examined was 326). In December 1955, after three consecutive years of annual residual spraying with DDT, the splenic rates ranged between three to six while the parasitic rate did not exceed 0.6 per cent. (number of persons examined was 237).⁶ The WHO/Government malaria service does not, however, extend its activities further north than the valley proper of Wadi Fatma, and beyond this, malaria is still highly endemic in the rural settlements scattered throughout the valleys leading to Medina.

6. Malariometric surveys of Mecca

Mecca town offers few breeding places for anophelines, but after torrential rains many residual pools are seeded with A. gambiae, and the inhabitants are threatened with outbreaks of malaria. Mecca is protected indirectly by the DDT spraying of nearby villages such as El-Sharayei. Many villages lying at the foothills, on the way to Tayef (the summer resort of Meccans situated at an altitude of 5200 feet) are reported to be highly malarious, but no investigations or control activities have been undertaken.

7. Malariometric surveys of Medina

Medina is the second sacred city of the Islamic world because it contains the tomb of the Prophet Mohammed. It has a population of about 35 000 most of whom live by cultivating its extensive gardens. During the pilgrimage season about 100 000 or more visit the city. The abundance of water in and around Medina seems to be one of the main contributory causes of the existence of malaria which is known among the Arabs as Yethrib (Medina) fever. During the period March 1950 to the end of February 1951, the Government's hospital treated 4876 cases of clinical malaria, and reported 343 deaths from malaria.² Malaria transmission, mainly by A. sergenti, seems to occur between October and May. The town is also subject to outbreaks of malaria caused by A. gambiae, especially during the autumn. No organized antimalaria activities are being undertaken, but a new malaria unit will be established within two years.

IV. THE PILGRIMS: COUNTRY OF ORIGIN AND METHODS OF TRANSPORT

The pilgrims constitute a mass agglomeration of various nationalities and races mostly coming from Asian and African countries. Although most of them are males, a good proportion of women, and some children, are represented.

The following table shows certain official data gathered during the 1954 pilgrimage, giving the number of pilgrims from each country and the means of transport taken to reach Mecca.⁵

Country	Total number of pilgrims	Method of travel
Aden Colony	1 187	Sea and air
Aden Protectorate	3 628	Land, sea and air
French Equatorial Africa	126	Air
French West Africa	1 395	Sea and air
Algeria	2 564	Land, sea and air
Bahrein	396	Air
Burma	65	Air

Country	Total number of pilgrims	Method of travel
Ceylon	83	Sea and air
Egypt	20 628	Sea and air
Trucial States (Oman)	800	Sea
India	7 360	Sea and air
Indonesia	10 229	Sea and air
Iraq	7 425	Land, sea and air
Iran	7 000	Land, sea and air
Jordan	2 948	Land, sea and air
Kuwait	2 668	Land and air
Lebanon	1 353	Land, sea and air
Libya	179	Land and sea
Federation of Malaya	5 404	Sea
Morocco (French)	520	Land, sea and air
Pakistan	17 566	Sea and air
Singapore	1 537	Sea and air
Somalia (Italian Admin.)	79	Sea and air
Somaliland (Protectorate)	77	Sea
Somaliland (French)	234	Sea
Sudan	19 194	Sea
Syria	7 732	Land, sea and air
Thailand	787	Sea
Tunisia	790	Land, sea and air
Turkey	11 311	Land, sea and air

From the above table, one notes that pilgrims reaching Mecca from countries where malaria eradication will be implemented, namely, Lebanon, Syria, Jordan, Iraq and Iran, number about 26 458. If we add to this figure those coming from Turkey (11 311) and from Egypt (20 628), countries which are considering the implementation of the malaria eradication system, this brings the total to about 58 397 people.

V. IMPLICATIONS OF PILGRIMAGE ON MALARIA ERADICATION PROGRAMMES

From the facts mentioned previously, we can imagine how an epidemic of malaria in the Holy Places of Islam will affect the malaria eradication programmes in the countries of origin of returning pilgrims. Apart from such explosive epidemics in the Holy Places, the mere fact that most of the pilgrims coming from Turkey, Syria, Lebanon, Iran, Iraq and Jordan travel by inland routes will expose them to malaria, especially when the pilgrimage falls during the malaria transmission season. If we consider that the preparation and travelling by land for attending the pilgrimage takes one month before the ninth day of Zulhidga, and the departure process takes place one month afterwards, this would mean that beginning 1958 (when ninth Zulhidga will coincide with 26 June) and during the following quarter of a century, the pilgrims from the above-mentioned countries travelling inland through Saudi Arabia will be subject to malaria infection during that period. It is feared that malaria-infected pilgrims, once they return to their homeland, will become foci for malaria transmission, especially where DDT residual spraying campaigns are discontinued and surveillance systems established. It is the intention that the malaria eradication service in each country will carry out the surveillance programme after discontinuation of DDT for three years before it is handed on to local health bodies, and unless the returning pilgrims are given due consideration in the surveillance programme to be carried out by either authority, the malaria eradication programmes will be under constant threat.

Another implication which may arise is the transport by air, sea or land of DDT-resistant strains of malaria vectors, or other efficient vectors to neighbouring countries. In Al-Hasa province A. stephensi has been found to have acquired DDT resistance, and its introduction to Iraq and Iran has to be kept in mind.

VI. MEASURES THAT MIGHT BE CONSIDERED

It is very encouraging to know that the Saudi Arabian Ministry of Health is now beginning to expand its antimalaria activities to cover many malarious areas in the country. The Government, impressed by the successful antimalaria activities of the WHO team in Jeddah, Wadi Fatma and Mecca, has budgeted for the establishment of nine malaria units in the following areas: Jeddah, Mecca, Medina (on the west coast); Katif, Hofuf (on the east coast); Riyadh and Khobar (on the Central Plateau) and Jizan and Asir (in the South). The Government has commenced recruitment of foreign malariologists and entomologists for the units on the east coast. These, together with the WHO malaria team operating on the west coast will be organizing a training programme for national sanitarians and technicians needed for the units. The organization of the work of these units, and the expansion of their activities to include the multitudinous number of rural settlements, will certainly take some time. It is regretted that the northern territory of Saudi Arabia, including the highly malarious Sirhan and Kasima valleys which intercept the inland routes of pilgrims coming from northern countries, is not included in the planning of the Antimalaria Service of the Saudi Arabian Government. It is for the above-mentioned reasons that the malaria threat to pilgrims will continue for some time until the newly-established Antimalaria Service involving the whole country will be fully staffed and organized to take charge of the whole problem.

To obviate any implications which the pilgrimage may have on the malaria eradication campaigns in the countries situated north and east of Saudi Arabia, the following measures might be considered:

1. The preparation of an annual report on the malaria status of Saudi Arabia during the malaria transmission season (October to May), especially in the Holy Places, and along the inland routes of pilgrims coming from countries north and east of Saudi Arabia. This report would summarize the results of malariometric surveys, the antimalaria activities of the various units, and any relevant investigations regarding the degree of susceptibility of malaria vectors to chlorinated hydrocarbons. Such report should be addressed to EMRO, for circulation to all countries concerned.

2. The Saudi Arabian air and sea ports used for arrival and departure of pilgrims should establish antimalaria measures which would keep these ports free from any infestation of malaria vectors, within a radius of at least five kilometres.
3. Disinfestation of ships, aeroplanes, trains and motor vehicles used by returning pilgrims should be carried out at the frontier posts or landing ports receiving the pilgrims, by the health authorities of the governments implementing malaria eradication programmes.
4. The names and addresses of pilgrims from each country where malaria eradication will be implemented should be kept in the files of the Ministry of Health. It is the duty of the Malaria Eradication Service to maintain surveillance of these pilgrims in areas where discontinuation of the DDT residual campaign has been effected - for at least a year after their return. Blood examination of each pilgrim should be carried out once a month during the malaria transmission season and a full course of treatment with Chloroquin and Primaquin given to every positive case.

REFERENCES

1. Buxton, P. A. (1944). Rough notes: Anopheles mosquitos and malaria in Arabia. Trans. roy. Soc. trop. Med. Hyg. 38, 205-214.
2. Farid, M. A. (1951). World Health Organization unpublished report.
3. Omar, W. (1952). The Mecca Pilgrimage: Its Epidemiological Significance and Control. Postgrad. med. J. 28, No. 319, 269-274.
4. World Health Organization (Restricted Publication) Malaria Information No. 8, December 1955: New Records of Anopheline Resistance to Residual Insecticides.
5. World Health Organization (1955). Wkly epidem. Rec. 32, Supp. 4.
6. Zahar, A. (1955). World Health Organization unpublished report.