OFFICE OF MALARIA CONTROL IN WAR AREAS
1942 - 1944
ORIGINS AND ACTIVITIES

The Office of Malaria Control in War Areas (MCWA), the World War II organization which was to become the forerunner of the present Centers for Disease Control (CDC), was established by the Public Health Service in 1942. The new organization, MCWA, was given the task of malaria control and prevention in areas around military bases and industrial areas concerned with production related to the war.

Of all the diseases transmitted to man by insects and animals, malaria was the most serious threat to civilian and military health during World War II. Experts had predicted a cyclic upswing of malaria in the United States in 1941. Military and industrial mobilization, begun in 1940, could be expected to accelerate the predicted increase. Thousands of persons, both civilian and military, were moving into malarious areas in the Southeast.

The experience of the Public Health Service in World War I and later showed that extraordinary measures would be needed to protect troops and the public from malaria. An existing cooperative program of the Public Health Service, the states, and the Works Progress Administration (WPA) could not provide this protection, for by the spring of 1941 the WPA could not provide the necessary labor.

To assist the Army in solving problems with malaria, the Public Health Service in the spring of 1941 detailed Dr. Louis L. Williams, Jr., its chief specialist in mosquito-borne diseases, as liaison officer to the Fourth Service Command of the Army in Atlanta, Georgia. Most malaria in the United States was in the area of this command. Dr. Williams drafted the plan of field organization for malaria control in military areas. The Public Health Service also assigned engineers amd entomologists to certain state health departments to assist with malaria control in defense areas. Thus in 1941, with no funds as authority for organization, the Public Health Service did what was possible to provide protection against malaria.

Finally, with strong support from the War Department, the Public Health Service received an appropriation in 1942 to operate a program for malaria control in war areas in 15 southeastern states, Puerto Rico, the Virgin Islands, and other Caribbean areas controlled by the United States.

Thus was born the Office of Malaria Control in War Areas (MCWA), with headquarters in Atlanta. Dr. Williams was in charge, assisted by sanitary engineer officer Mark D. Hollis, Harry G. Hanson, and Wesley Gilbertson. Later they were joined by Stanley B. Freeborn, a medical entomologist. The knowledge the Public Health Service already possessed on military and defense areas was an important factor in planning malaria control.

MCWA, working with state and local health departments, set up mile-deep mosquito-free zones around each military and war industrial establishment. A

mile is the flight range of Anopheles quadrimaculatus, the malaria mosquito prevalent in the Southeast. In most locations, minor drainage to dry out breeding areas and spraying to kill larvae were sufficient. In others, major drainage was required.

The basic MCWA plan was to form control teams of physicians, engineers and entomologists, to locate infected humans, determine the prevalence of mosquitoes, find the breeding places, and apply control measures. Medical, engineering, and entomology divisions were set up under the direction of Dr. Trawick Stubbs, Nelson H. Rector, sanitary engineer and George H. Bradley, entomologist.

As of January 1, 1943, the Public Health Service employed, through state health departments, 4,340 persons, of whom more than 3,000 were laborers in malaria control work, supervised by physicians, engineers, and entomologists.

Dr. Williams recalled later that he had been confronted with the terrific problem of getting enough cars and trucks to distribute the larvicide and the laborers to drain the swamps. Then, he said, what seemed to him like a miracle happened, "I was still a liaison officer wanting to go to MCWA when into my office walked a young Public Health Service engineer, Mark Hollis," he said. "He had come to Atlanta for the sole purpose of talking to me. He had heard in Washington that the construction of Camp Blanding, below Jacksonville, would soon be completed and that between 800 and 900 cars would be freed for other operations. After we talked, he went right to Jacksonville. He asked several persons in the State Department of Health who they knew in the Army and got acquainted with the contractors. Eventually an expert volunteered to pick out for him every good car as it came off the job and slide it into an assembly lot. The State Health Officer arranged with the Road Commissioner to convoy these cars, furnishing the drivers, protected by 20 to 30 State traffic police, into the Jacksonville Quarantine station. It was a spectacular show. From there they were eventually shipped by the Atlanta office to the malaria control areas. We had almost enough automobiles for our work throughout the war. I have always thought Mark Hollis earned his pay as a public servant on that one auto deal."

During the height of operations, MCWA was doing control work around 2,200 locations in 19 states. Highly mechanized equipment including boat and truck-mounted high pressure sprayers and oil-water centrifugal pumps were used in the program. Larvaciding operations used vast quantities of oil and Paris green.

In June 1943, Dr. Williams was assigned to the Office of the Surgeon General of the Army to go to Algeria as malariologist for the Mediterranean area in preparation for the invasion of Italy. His brother, Dr. Charles L. Williams, then in charge of the PHS District Four office in New Orleans, took over the directorship of the MCWA in addition to his work with District Four. He served until January 1944, when he was assigned to the Bureau of State Services in Washington. Mark D. Hollis then was put in charge of MCWA, with the title of Sanitary Engineer Director.

Besides mosquito control operations, MCWA's program included community educational projects designed to acquaint the public with the basic facts about prevention of malaria. MCWA developed a team of writers, artists and motion picture producers who produced numerous audiovisuals for this purpose. This group later developed into the CDC audiovisual activity, and later the National Medical Audiovisual Facility which is no longer a part of CDC.

Malaria did not remain the sole concern of MCWA. In certain areas, including Hawaii, Aedes aegypti and dog-fly control were undertaken. Returning veterans were seen as possible carriers not only of malaria but also of numerous other infestions, many of which were unknown or rare in the United States. It seemed possible that missed, relapsing, or incompletely treated cases of malaria, amebiasis, filariasis, schistosomiasis, leishmaniasis, oriental hookworm disease and other parasites might come to the attention of physicians in the United States. To aid physicians and technicians in the diagnosis of tropical and parasitic diseases, MCWA established special informational and training facilities. In response to requests from state and territorial health officers and laboratory directors and the American Society of Tropical Medicine, MCWA in 1945 began offering a course in the diagnosis of parasitic diseases. This was offered several times a year, primarily for persons employed in state and territorial laboratories. Dr. Marion Brooke was in charge of this activity, with Dr. Mae Melvin who continued to teach a similar course in 1982.

The Foreign Quarantine Division was concerned with eradicating the Aedes aegypti mosquito, carrier of yellow fever and dengue, from southern U.S. port cities. MCWA helped form small groups of workers to establish mosquito-free zones around threatened areas. Toward the end of the war, MCWA trained municipal sanitary inspectors in port cities in Aedes aegypti inspection. This resulted in a corps of trained inspectors for any future emergencies.

In July 1943, two cases of dengue fever were reported in Hawaii, in the Waikiki district of Honolulu, the famed rest and recreation center for two million American GI's on their way in and out of the war against Japan. Epidemics of dengue had occurred in Honolulu in 1903 and 1912. Two vectors of dengue were prevalent in Hawaii--Aedes aegypti and Aedes albopictus. The latter was found to be the chief vector, breeding chiefly in the water-storing plants on the island. Within a month, 40 cases of dengue had occurred among civilians, and Waikiki was declared off limits for military personnel. Before the end of August, 50 or more cases were occurring weekly. Public Health Service officers supplied the "know how" for a spraying and clean-up control campaign against the mosquitoes. At the peak of the epidemic, 400 soldiers were detailed to the program in 50 communities. Dengue was brought under control, and never gained a foothold outside of Honolulu.

Murine typhus fever appeared to be on the increase in wartime, and was invading areas where it had not been noted before. The far-flung organization of MCWA with its many specialties, equipment and facilities was enlisted to bolster state resources in control of rats. The Typhus Control Program, which had been set up in 1942, was transferred to MCWA in 1945.

In addition to headquarters in downtown Atlanta, MCWA acquired a number of field locations. The Henry R. Carter Laboratory at Savannah, a research center, was named after Dr. Carter, who wrote an early history of yellow fever, determined the period of incubation of yellow fever, and was an early advocate of malaria eradication in the United States. This laboratory later evolved into the Technical Development Branch of CDC under the director of Dr. Samuel W. Simmons. In 1944 a field station of lasting benefit to MCWA was established at Newton, Georgia. This was the Emory University Field Station which looked at transmission rates and the relationship of malaria organisms to the environment.

Many services were necessary to support the operational activities of MCWA. Personnel trained and experienced in insect and rodent control were needed, but few were left in the United States after military demands had been satisfied. Thus it was necessary to train large numbers of inexperienced individuals. To do this rapidly, audio-visual techniques had to be created. Field, laboratory and office facilities had to be established for mapping and surveying, and for collecting, staining and examining thousands of blood samples and collection of mosquitoes and other insects. Improved methods, equipment and materials for use with pesticides had to be developed.

MCWA carried out special investigations alone or in cooperation with the National Institutes of Health (then singular), the Tennessee Valley Authority, the U.S. Department of Agriculture, and various state health departments and universities. These investigations dealt with, among others, spread of foreign strains of malaria parasites, effectiveness of DDT against mosquito larvae and adults and other insects and its effects on certain aquatic organisms other than insect larvae, and flight habits and range of the Anopheles. The studies showed, for instance, that DDT frequently failed as a residual larvacide but was generally effective against mosquitoes, houseflies and rat fleas.

MCWA scientists and other investigators contributed numerous articles to medical and technical publications on such topics as density of Anopheles and prevalence of malaria; accidental transportation of mosquitoes by automobile; entomological phases of malaria control programs; problems created by returning malaria carriers; probable role of the cat flea in transmission of murine typhus; economic aspects of mosquito and malaria control in war-time; educational opportunities in the prevention of malaria; effect of DDT residual deposits on scorpions, and post-war malaria control.

The introduction of DDT in 1944 profoundly affected the malaria control picture. Arriving as it did in the middle of a malaria control program, it offered an opportunity to strike a severe blow against malaria. MCWA conducted numerous studies on its use, both on its effectiveness and on its effects on the environment other than its usefulness in killing mosquitoes. DDT research was the chief work of the Henry Rose Carter Laboratory at Savannah, Georgia, which MCWA acquired in 1943. A formulation of DDT mixed with water to form a spray would adhere to walls, furniture and other surfaces. It would retain its insecticidal property for long periods. In view of concern that DDT would kill beneficial insects, the Public Health Service and the U.S. Army in a public statement a few months after its

introduction, recommended that DDT not be used to kill mosquitoe larvae where there was danger to fish and that broadcasting it from airplanes be done only "with due regard to the possible effects of DDT on beneficial insects and all forms of plant nd animal life..."

The joint statement also said, "Much still must be learned about the effect of DDT on the balance of nature important to agriculture and wildlife before general outdoor application of DDT can be safely employed in this country.

Reported malaria prevalence was at an all-time low when MCWA began in 1942, and in spite of the introduction of large numbers of people into areas where malaria was or had been prevalent, it continued to decline. By 1944 and 1945, large numbers of members of the Armed Forces and veterans who had been exposed to malaria were returning to the United States, and health authorities feared extensive epidemics of malaria. Accordingly, Congress in December 1944 approved what was known as the Extended Malaria Control Program and in 1945 control programs were re-oriented. Instead of concentrating on controlling mosquito breeding in areas around military installations and war plants, the program was directed toward protecting the entire population throughout the areas where conditions for trnsmission of malaria were known to exist. Residual DDT was applied within houses in those areas.

Although the malarious area of the United States was substantially reduced by the close of 1944, there were 120 counties in the South where malaria remained a critical problem. Most of the 120 counties were rural and had no war plants. In the extended program, the Public Health Service assigned personnel to the states to assist with malaria control. MCWA provided training in malaria control for state and local workers and developed a community education program to get the cooperation of families whose homes were to be sprayed and to dispel fears about the return of military persons who were carriers of malaria.

With the end of hostilities, federal programs connected with the war were gradually liquidated. Malaria dropped sharply during World War II; the mortality rate declined each year, and in 1944 was less than half that of 1941. This decline occurred while 2 million veterans who had acquired malaria overseas returned to the United States. Throughout the war the U.S. Army reported the lowest incidence of malaria in its history among troops based in the United States.

As a wartime organization, MCWA was destined to be dismantled with the end of the war. However, during its short life span it had met new challenges in a way that demonstrated the wisdom and efficiency of attacking related health problems with teams of specialists whose activities were coordinated within a single organization. This experience affected the decision of the Public Health Service to retain MCWA and adapt it to a peace time organization with a much broader character.

Dr. Joseph W. Mountin, then chief of the Bureau of State Services, envisioned several separate Centers to deal with such subjects as communicable disease control, environmental sanitation and arctic health. Each would be located away from the District of Columbia, and would provide highly specialized services to the states. Thus on July 1, 1946, Surgeon General Thomas Parran redesignated MCWA as the Communicable Disease Center.