Chapter 3

THE HISTORIC ROLE OF MILITARY PREVENTIVE MEDICINE AND PUBLIC HEALTH IN US ARMIES OF OCCUPATION AND MILITARY GOVERNMENT

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INTRODUCTION

Military preventive medicine personnel are well known for their vital service rendered before and during wartime operations (see chapter 2, The Historical Impact of Preventive Medicine in War), but they have also played a critical role following the defeat of the United States' adversaries. With the signing of armistices and treaties in the aftermath of wars, the United States has frequently found itself in control of foreign territories, necessitating at times the formal establishment of short-term military governments over the people of those lands.[1–3] Under such conditions, military commanders and governors have become responsible not only for the health and welfare of their troops, but also for the well-being of thousands, even millions of civilians. Within this context, the civilian counterpart to military preventive medicine—public health—has been recognized as an "integral and essential function"[4(pxiii)] of civil affairs and military government.[4,5] The preventive medicine and public health initiatives of US military governments (or the lack thereof) have historically been directly linked to the good (or poor) health of US occupying forces.[6,7] In fact, the case was made strongly at the close of World War II that since they are identical in their aims, "preventive medicine for troops and public health for civilians who become wards of the army" should become combined into one organization.[8(p5)] In addition to fulfilling humanitarian requirements and international law obligations, the establishment or restoration and preservation of civilian public health infrastructure following war has been found to enhance the legitimacy of and local support for the occupying force.[9,10] While not an exhaustive review of the subject, this chapter will discuss the evolving role of preventive medicine and public health in military government following four of the United States' major wars.

THE MEXICAN WAR

The United States' first large-scale experience with military government is traced to General Winfield Scott and his declaration of martial law in Tampico, Vera Cruz, Puebla, and Mexico City during and at the conclusion of the Mexican War (1846–1848).[11] The public relations success of his administration was rooted in firm but fair regulations, which ultimately encouraged the people to oppose the Mexican president, General Santa Anna.[1] Unfortunately, from a preventive medicine and public health standpoint, General Scott's military government was rather impotent in the face of rampant disease in these communities and among his own troops.

Vera Cruz, the primary port city on the Gulf of Mexico occupied by Scott's troops, was well known as an extremely unhealthy place. Backing onto a large stagnant swamp, the city had been so wracked for centuries by malaria, yellow fever, and dysentery that the Spanish could hardly maintain a garrison there. Lieutenant (later General) Isaac Stevens wrote:

> Vera Cruz is a miserable, dirty place; the streets are full of filth....The filth and nastiness are almost beyond belief, our authorities are now making every effort to clean the city.[12(p443)]

Colonel Hitchcock, the Army's inspector general, wrote in his diary: "Have moved my tent to the suburbs, in preference to being in the city, which is very offensive and soon become sickly."[12(p443)] (Interestingly, one of the American officers who contracted yellow fever at Vera Cruz, Lieutenant Josiah Gorgas, was the father of William Crawford Gorgas, whose public health successes are discussed later in this chapter.[13]) Mexico City, which was entered by US forces on September 14, 1847, was also described as "exceedingly filthy,"[14(p298)] with human excrement on the open street. Sewage and adjacent bodies of water made ideal breeding sites for mosquitoes.[12]

At the encouragement of his medical advisors (particularly Surgeon General Thomas Lawson), General Scott directed that the following public health actions be taken in the towns and cities he controlled: the restoration of water supplies and sanitary facilities, the removal of waste and debris, the burial of dead bodies, and the inspection of food.[15] It is not at all clear what impact these efforts had on the health of the civilian populace and the occupying troops. General Scott's army suffered terribly while in Mexico, with an annual disease death rate of more than 10%. The physicians accompanying the US Army at this time had little idea how to prevent or control the epidemics of malaria, yellow fever, and dysentery, which would ultimately kill more than 2,600 US soldiers. In addition to lacking the requisite knowledge about the underlying causes and transmission of these dis-

eases, the physicians also held no rank or authority within the army they served.[12] After the signing of the Treaty of Guadalupe Hidalgo (February 2, 1848) and the election of a new Mexican government, US forces withdrew from Mexico City in June 1848, thus ending the United States' first foray into military government with its accompanying public health responsibilities.[15]

THE SPANISH–AMERICAN WAR

Although martial law was declared in certain US cities during the American Civil War (eg, New Orleans[15]), the military did not engage again in large-scale military government with its requisite civil public health activities until after the Spanish–American War. In the Treaty of Paris, signed December 10, 1898, Spain renounced its claim to Cuba, ceded Guam and Puerto Rico, and transferred sovereignty over the Philippines (for $20 million) to the United States. Under the newly established military governments of these conquered territories, military physicians and sanitarians would take the lead in bringing these new US possessions up to 20th century public health standards to help the inhabitants and protect the US soldiers and sailors stationed there.

Impoverished and disease-ridden, these tropical lands presented enormous public health challenges to the occupying forces. Unlike their military predecessors at the end of the Mexican War, however, the military medical professionals of this era knew much more about the microbial origin of infectious disease. Typhoid fever and cholera, for example, were known to be waterborne and transmitted in human excreta. Public health reformers and veterans of the US sanitation movement had seen mortality rates drop dramatically in major US cities with the installation of city sewers and the provision of safe drinking water. Military medical boards commissioned to investigate tropical diseases in these occupied territories would further advance this new "science" of preventive medicine, especially in understanding the transmission and control of lethal diseases such as yellow fever.[16]

Cuba

With the Spanish Caribbean Fleet destroyed, the city of Santiago, Cuba, surrendered to General William Shafter on July 17, 1898. Brigadier General Leonard Wood, United States Volunteers, Commander of the Department of Santiago, reported from the newly captured city that

> the conditions in and about the City of Santiago were serious in the extreme. [People] were dying at the rate of 180 per day. The city was full of sick people, there being hardly a house which did not contain one or more persons suffering from disease. The water main, which had been partially destroyed during the siege, had not been placed in complete repair, and there was a great shortage of water.[17(p171)]

General Wood ordered an immediate sanitary cleanup of the city. In the first 2 months alone, more than 1,100 animal and human bodies and 200 loads of trash per day were removed from the streets of the city. His people also started work on preparing a modern sewage system for the city. The mortality rate within the city dropped by 64% in the first 3 weeks of the cleanup(. Ironically, at this same time the "victorious" V Corps, rendered ineffective by yellow fever and malaria, was being shipped home, soon to be replaced by fresh troops. The addition of new, "non-immune" troops from the United States for occupation duty promised real problems for US military leaders. A smallpox epidemic that struck Santiago in the fall of 1898 was met with vigor by General Wood, who dispatched his 100 sanitary workers to disinfect buildings while his medical officers immunized 30,000 people[17,18] (Figure 3-1).

Sanitary conditions were bad throughout Cuba. Parts of Havana, in particular, were said to resemble "an outdoor cesspool" due the numerous dead animals, ubiquitous garbage, and open sewers.[19] From the city of Trinidad, Major Lewis Balch, Brigade Surgeon, US Volunteers, made the following recommendations:

> To insure the health of the troops in this province, necessary sanitary work should be done quickly.…The camps are near towns. Disease is to be feared from these towns, not from the country or mountainous districts. It is therefore, just as necessary that sanitary measures for prevention, the cleaning of streets, garbage collection, disinfection, reports of contagious disease, its location and character, the isolation of infected persons or things, and such like measures be taken, as it is to have camps pitched in healthy localities and properly policed....[17(p167)]

He went on to suggest that an engineer and a medical officer familiar with sanitation issues decide the necessary steps. His recommendations were put into action.

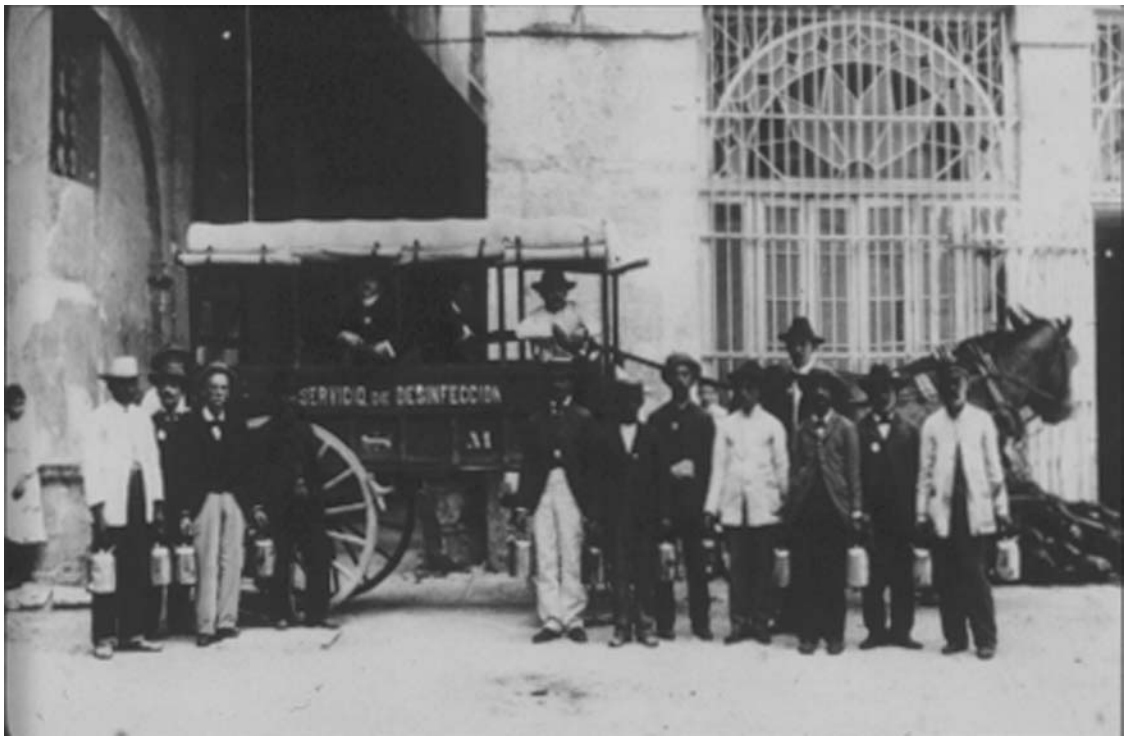

Fig. 3-1. The sanitary cleanup of Cuba under General Leonard Wood and the breakthrough discoveries of the Walter Reed Yellow Fever Commission resulted in a transformation of the island from its "cesspool" reputation to a place safe and healthy for both civilians and US troops. Pictured here is a team of public health workers responsible for disinfecting homes and public buildings. Photograph: Courtesy of the National Museum of Health and Medicine, Armed Forces Institute of Pathology, Catalog No. NCP 1734.

Military medical historian Mary Gillett has observed that the Army really had no choice but to clean up the civilian towns:

> The proximity of troops to Cuban communities made the problems involved in preventing disease among the troops and in the civilian community interdependent. Because local authorities in the impoverished nation did not have the resources needed to conduct a thorough cleanup and disinfection of Cuban towns, "reclaiming towns from their present unsanitary condition" became the responsibility of the military government of the island.[20(p232)]

Once he took over as the Military Governor of all of Cuba in December 1899, General Wood provided renewed vigor to an island-wide sanitation campaign begun by his predecessor, General Brooke. Not having to gather public support as the sanitation reformers had to in the United States, the military commanders of the different administrative departments of Cuba mounted their campaigns with military precision. However, those who incorrectly believed yellow fever to be a "filth disease" were dumbfounded when the disease struck the "disinfected" island in mid-1899. Through 1900, the yellow fever epidemic would claim 300 lives from both the civilian and military populations of the island, prompting Army Surgeon General George Sternberg to appoint what would be called the Yellow Fever Commission, chaired by Major Walter Reed.[15,21,22]

By 1901 the commission confirmed Carlos Findlay's theory that the disease was transmitted by mosquito and not by filth or fomites.[23,24] Armed with this information, General Wood gave his full support to Major Gorgas' anti–yellow fever campaign, which would focus primarily on eliminating the *Aedes aegypti* mosquito.[15,24,25] In addition, steps were taken to isolate yellow fever patients from mosquitoes to prevent any further transmission. Within 3 months, yellow fever had disappeared from Havana.[23,24] A similar campaign against *Anopheles* mosquitoes was subsequently mounted and given credit for reducing Havana's malaria rate 75% by 1902, the year the United States ended its

occupation of Cuba.[16,17,25,26] As the US occupation ended, General Wood appointed Cuban civilians to run the government and named a five-member board of public health for the island. Major Gorgas remained in Cuba as the "District Surgeon for troops."[20(p250)] Following civil unrest, US forces again governed the island from 1906 through 1910 during which time sanitation and public health programs again became the responsibility of the US military.[27–31]

Puerto Rico

Health conditions in Puerto Rico in 1898 were comparable with those of Cuba. The US Army's sanitary cleanup of the island included disinfecting homes, rehabilitating the city's water system, and immunizing more than 800,000 citizens against smallpox, which was epidemic at the time. Major John van R. Hoff established a board of health in 1899 to oversee public health for the island and to write its first sanitary code.[17,32] A major hurricane hit the island on August 8, 1899, destroying many buildings, including barracks and hospitals. The devastating impact on the island's agricultural economy placed many at risk for starvation and led to a million-dollar relief program run by the military: "From Sept 16, 1899, to Jan 22, 1900, the average number of destitute people fed each day was reported as 182,195."[21(p189)] It was during this relief program that Lieutenant Bailey K. Ashford discovered that all of the inhabitants were severely anemic. Later he would reach near-hero status for leading an island-wide campaign to eradicate hookworm, the cause of the anemia.[33–35] Military government in Puerto Rico formally ended in 1900 with the election of a civilian government, yet US military involvement in Puerto Rican public health matters would continue until after World War II.[36]

The Philippines

Commodore George Dewey led a US naval squadron into Manila Bay on May 1, 1898, and quickly destroyed the anchored Spanish fleet. By August 1898, US soldiers occupied the city of Manila. The sanitary conditions found by US troops in the towns and villages of the Philippines were described as "execrable." "Filth of all kinds underlay and surround the houses, and the hogs were the only scavengers."[21(p98)] Sources of drinking water, commonly shallow wells, were highly contaminated. The city of Manila, in particular, got its drinking water from the Pasig River, in which 20,000 inhabitants bathed, defecated, and dumped dead bodies. Years of poverty, overcrowding, and malnutrition favored the spread of numerous infectious diseases. Spanish records from before the US occupation revealed a death rate some 50% above that of major US cities.[37] A large US troop presence was necessary, though, because after years of fighting the Spanish, Filipino guerrillas now challenged their new colonial master, the United States.[38]

Within the first month of occupation (September 1898), the military government formally organized a Municipal and Marine Board of Health for the Manila area. This board, which established a set of sanitary and quarantine regulations, was composed of six US Army Medical Corps officers (active members) and two Filipino doctors (honorary members). The board divided the city into 10 districts, with a Filipino physician assigned to each one.[39] Individuals from the community were then trained and made responsible for conducting regular house-to-house sanitary inspections and levying fines on those who violated sanitary regulations.[23] Colonel Charles R. Greenleaf reported that by 1900 this Board of Health had

> …made great progress in cleaning the streets of the city, in removing filth that has been accumulating for years, and in regulating, to a certain extent, the purity of the food supply; it has practically stamped out smallpox by forcible vaccination and revaccination, where it was necessary, and has held in check the progress of bubonic plague.[21(p99)]

Within 1 year, 2 million homes were inspected or reinspected.[23]

During the Philippine cholera epidemic of 1902 to 1904, the Board of Health closed all of the city's shallow wells, digging new ones to a depth of 700 to 1,000 ft. In an effort to protect the river, some public latrines and laundries were established along the Pasig. The sale of fruits and vegetables that could be eaten raw was prohibited, and the entire city was placed under quarantine. Unfortunately, these public health efforts did not reach beyond the city into the rural provinces. During this 2-year epidemic, cholera claimed at least 109,461 lives, 305 of whom were US soldiers.[40]

Two military tropical disease boards for research operated out of the city of Manila from 1899 to 1902 and 1906 to 1914, primarily studying dysentery, dengue, plague, beri beri, cholera, and yaws.[41] Epizootics of rinderpest and surra decimated the islands' livestock in the first few years of occupation, killing 90% of cattle and water buffalo and 60% to

75% of horses and ponies. A serum development and immunization campaign mounted by the Tropical Disease Board dropped the death rate of large animals to just 3% by 1903, perhaps saving the economy of the Philippines.[42–44]

After 1904, the Board of Health was replaced by the Bureau of Health with a US Public Health Service doctor as director.[39] Thereafter, the military's role in public health diminished as civilian responsibility increased.

WORLD WAR I

Less than 20 years later and under very different circumstances, US military preventive medicine personnel would play a key role in the occupation of a defeated Germany.[45] In compliance with the terms of the armistice signed on November 11, 1918, Germany turned over to Allied armies all occupied regions, Alsace-Lorraine, the west bank of the Rhine (the Rhineland), and the bridgeheads of Mainz and Coblenz. The newly formed, 8-division, 260,000-man US 3rd Army occupied and governed parts of the Luxembourg and the Rhineland from Trier to Coblenz. [46]

Having just 3 weeks to prepare for this mission, the 3rd Army was fortunate in that it faced a generally cooperative population of nearly 1 million. No destruction had preceded the occupation, and there were no serious shortages of civilian supplies. At the request of General Pershing, civilian officials continued to serve in their original capacities. [15] US Army medical officers (generally division surgeons) were given supervisory and disease reporting responsibilities for the administrative districts (*Kreise*) that corresponded to their division's geographic location. In addition to evaluating the general conditions of sanitation within each *Kreis*, a US Army sanitary officer from the Office of Civil Affairs specifically supervised each civilian district health officer (*Kreisarzt*) in the performance of his duty.[16]

The considerable movement of people during and after the war, coupled with a lack of laboratory supplies, had hurt the German government's established anti–typhoid fever program. Interested in reviving this disease-control effort, US medical personnel conducted a bacteriological survey to determine the carrier rate in the civilian population. German physicians and medical laboratories were also surveyed concerning the incidence of disease in the zone of occupation.[47] During the winter of 1918 to 1919, a seriously contaminated well led to an outbreak of typhoid fever in the town of Brück. When the *Kreisarzt* appeared to be unable (or unwilling) to stop public use of this well, US authorities took charge and shut down the well and removed its pump. This was followed by a US-sponsored typhoid fever vaccination program for the community. A similar typhoid fever outbreak in the town of Altenahr required the same interventions, with the local *Kreisarzt* being fired and replaced by a competent German physician.[48]

German-speaking US Army nurses took the lead in the city of Trier, visiting the homes of more than 1,000 families to determine the effects of the German government's war food ration on the health of the people. In this population-based health and nutrition survey, they reported that

> the amount of sickness was striking. In three-fourths [of the homes] some member was sick. Scrofula and rickets [were] very common in children; pulmonary tuberculosis and influenza in adults.[49(p421)]

American medical personnel were also instrumental in providing aid to allied prisoners of war in German hands. Prior to repatriation, US preventive medicine personnel supervised German-run prisoner-of-war camps. These camps contained more than 45,000 men at the time that the Inter-Allied Commission took control. The original sanitary condition of all of these camps was "frightful." "Words can give only a slight idea of the filth and dirt in which these Russians lived."[50(p125)] From March to August 1919, there were 485 deaths from tuberculosis. Many of the Russian prisoners also suffered from trachoma. In response to these deplorable conditions, US Army medical officers employed Russian sanitary squads in a general cleanup campaign in all of the camps. Given the large number of men under these conditions, the occurrence of epidemic diseases in the camps was remarkably low. Only one case of smallpox was reported and six cases of diphtheria, but 45 deaths were attributed to influenza. At least 164 inmates had typhus; 17 of them died. German sanitary squads, under US supervision, deloused camp inmates. US Army Medical Corps officers even accompanied the Russians, Romanians, and Serbians on their repatriation trek back to their homelands.[50]

With the signing of the Treaty of Versailles on June 28, 1919, the American 3rd Army was inactivated and the majority of US forces sent home. About 8,000 US troops stayed behind for occupation duty as the American Forces Germany (later

the American Department of the Inter-Allied Rhineland Commission).[16] Lieutenant Colonel Walter Bensel, MC, (and his successors: Major Morrison C. Stayer, MC, and Major Thomas J. Flynn, MC) organized and led the Department of Sanitation and Public Health for the American area of occupation. Continuing to exercise control of public health programs through German channels to the various *Kreisarzte*, these preventive medicine officers orchestrated the sanitation inspections of German prisons, hospitals, public bathing establishments, barber shops, cafes, hotels, theaters, cinemas, and slaughterhouses. In addition they established and enforced a civilian medical surveillance reporting system for contagious diseases, deaths, and births. Through their efforts in 1920 alone, they tracked and responded to epidemics of influenza (474 cases), paratyphoid (117 cases), and measles (145 cases). Tuberculosis continued to be a problem for the pubic, given overcrowding and poor ventilation in many German homes. The prevalence of tuberculosis was estimated by survey at 2.2 per 1,000 (6.5 per 1,000 in Coblenz). With the revocation of antifraternization restrictions in September 1919, sexually transmitted disease rates among US soldiers saw a sharp increase to 422.65 per 1,000 annually (October 1919), necessitating the establishment of a court for vagrants (including prostitutes) with subsequent detention and treatment of those women found to be infected. American parentage was also alleged in over one-third of the illegitimate births in 1920 (411 of 1,134) occurring in the American area, especially in Kreis Mayen, where soldiers were billeted with private families instead of in barracks.[51] American forces formally ended their occupation of German soil on January 27, 1923.[15]

WORLD WAR II

With the fall of France to the German Army in June 1940, it became clear to the US military leadership that it was just a matter of time before the United States entered the war. By this date Lieutenant Colonel (later Brigadier General) James S. Simmons, chief of preventive medicine in the Army Surgeon General's Office, had already recruited professionals from civilian health positions to help him plan for the expected civil public health activities that would accompany and follow war in Europe. By late June, they had already submitted to the Army Surgeon General a plan for public health administration in occupied countries. The newly formed Medical Intelligence Division of the Preventive Medicine Service further provided essential medical and sanitary data on foreign countries for use in civil affairs training and planning.[10]

Even with this preparation, the vastness and complexity of Army civil public health activities throughout Europe and the Pacific at the close of World War II would prove to be a tremendous challenge. With the defeat and surrender of the Axis Powers in 1945, a relatively small cadre of US Army medical and sanitary officers had to help reestablish public health services for over 300 million people worldwide[7,52]:

> It is estimated that the number of our military government public health officers in World War II, including replacements, never exceeded about 700, of whom some 50 served in North Africa, Sicily and Italy, 175 in Germany and Austria, about 425… in the Philippines, Japan and Korea, and the remainder in various other occupied and liberated areas from Norway to the Ryukyus. Added to this light brigade of 700 officers were about as many enlisted men of technician grade, some of whom performed highly responsible duties.…about 1/3 of these 700 military government public health workers were medical officers…the remainder consisted of sanitary engineers and sanitarians, entomologists and parasitologists, bacteriologists and nutritionists, a few veterinarians and nurses, and other specialists…[52(p260)]

Although it would evolve and change names and organizational structure from 1943 to 1945, the Allied Military Government of Occupied Territory was activated by General Eisenhower in North Africa in May 1943. Its Public Health Division ultimately served only as an advisory, policy-making, information-providing agency with no direct control over public health operations in the field. These missions were instead handled by the medical and sanitary officers assigned to military government units by the Medical Regiment of the European Civil Affairs Division.[52,53] (Military government in the Pacific was organized and functioned somewhat differently and is described in the section on Japan.)

Italy

The military occupation was established in Italy while the war effort was still very active in Europe. This made it crucial to deal with the circumstances that were hindering the war effort. The uncondi-

tional surrender of Italy on September 8, 1943, placed the southern portion of the peninsula in Allied hands. Faulty intelligence reports had led military government planners to expect that the Italians would be self-sufficient, but the Allies soon found themselves in the midst of a major civilian relief effort, which greatly slowed the progress of military operations. Three immediate public health emergencies faced the people of southern Italy in the fall and winter months of 1943 into 1944: (1) poor harvests in Sicily and southern Italy, coupled with the retreating Nazis' scorched-earth policy, left the people near starvation, (2) the return of sick Italian soldiers from the Russian front a few months before the Allies arrived had "seeded" the lice-infested, overcrowded cities with typhus, and (3) at the encouragement of the retreating German Army, hundreds of thousands of displaced civilians streamed southward into the Allied-occupied area seeking food and shelter.[54,55]

A report from the city of Naples on the day after it was captured describes the situation:

> Medical supplies reported short. Number of doctors apparently adequate. Food situation serious. Reported that Germans took all stocks of food. Water situation acute. Viaduct and some of the reservoirs blown up, but 15 days supply of water on rationed basis available for present population....All transportation including electric trolley busses were taken by Germans. All industrial plants, warehouses and hotels reported destroyed. It was estimated 600,000 persons remained in city.[56(p240)]

The shortage of food, destruction of housing, overcrowding, loss of clean water and waste disposal, and social disruption all contributed to various infectious disease epidemics in the region. More than 12,000 people lived on a semipermanent basis in the deep tunnels and cellars (*ricoveros*) that had served as Naples' air raid shelters. Typhus proved to be a particular concern in the Naples area, jumping from 25 cases in October 1943 to more than 1,000 in January 1944.[55]

Unfortunately, a "multiplicity of commands"[55(p311)] and administrative confusion about who was responsible for the civilian crises resulted in a delayed Allied response. In December 1943, General Eisenhower provided the proper command emphasis to get adequate food relief flowing:

> It should be understood that our requisitions for food are not based on humanitarian or any other factor but that of military necessity. Conditions in Southern Italy and Sicily are such that unless reasonable quantities of food are supplied very promptly, we will experience sabotage, unrest, and a complete cessation of all those activities considered necessary to our advance.[56(p315)]

Not waiting for a military response to the spreading typhus epidemic, Dr. Fred L. Soper and his colleagues from the International Health Division of the Rockefeller Foundation began a block-dusting effort in Naples with newly available DDT (dichlorodiphenyl-trichloroethane).[57] Having realized the potential threat to military personnel of such an outbreak, Brigadier General Leon A. Fox of the Typhus Commission, which had been established in 1942 to study typhus and devise methods to control it, took over the effort. He instituted a comprehensive, four-point campaign[56]:

1. Mass delousing of population of Naples,
2. Organization of a complete case-finding service with the cooperation of Italian-speaking physicians and priests,
3. Disinfection of contacts (at home and place of work), and
4. Immunization of key personnel (eg, hospital staffs, police, priests).

More than 1.5 million people were dusted with 5% DDT in talcum powder; special emphasis was given to those in air raid shelters and refugee camps. By February 1944, the epidemic was under control.[55] (American troops in Europe had already been immunized with the Cox-type typhus vaccine.[58]) In addition to the typhus situation, sexually transmitted diseases, smallpox, and malaria were also large problems that required aggressive control measures.[6,55]

An eruption of Mount Vesuvius (March 18–24, 1944) prompted the Allied Military Government and the American Red Cross to evacuate, feed, and shelter some 20,000 people from the towns in the vicinity of the volcano.[59] By the spring of 1944, the US 5th Army was daily feeding approximately 200,000 people. To the greatest extent possible, Italian Communal Public Assistance Boards (where they still existed) and Italian relief agencies were encouraged to take the lead in these areas, with the Allies providing supervision only.[56]

Germany

In the months immediately before the surrender of Germany, Allied leaders were given a glimpse of

what to expect once the Third Reich finally collapsed:

> In recent months hundreds of thousands of displaced persons, refugees, and prisoners of war have been found, many in a pitiable state of nutrition and health, as a disorganized mass movement of huge proportions has taken place in eastern Germany.[58(p113)]

One report from the US 3rd Army in February 1945 stated:

> A great difficulty presents itself in that there are little or no medical facilities in some areas….There are no doctors, no hospitals, no medical supplies, no ambulances—a complete medical vacuum.[58(p113)]

When Germany did finally surrender on May 8, 1945, the nation was in chaos. Civil government, and with it the German public health system, had ceased to exist with the flight of Nazi officials. Thousands of Germans were homeless. Millions of foreign nationals who had been brought as slave labor to the industrial areas of the Third Reich were now displaced persons. Food stocks were almost totally exhausted in the cities. Little transportation existed.[60]

In the short term, US Military Government units were directed to "[assist] in the protection of our military forces and [prevent] unrest among Germans by the wise use of medical resources and the reestablishment of an adequate German public health service."[61(p943)] The ultimate objectives would be

> to insure that German health services and facilities were reestablished and maintained by the Germans, to prevent and control communicable diseases, and to eliminate health hazards that might interfere with the military administration of Germany, threaten occupation forces, or create hazards to other countries.[60(p496)]

Nutrition

Ascertaining the nutritional status of an entire population through scientific survey methods proved to be of enormous value to military public health planners of emergency feeding programs in Germany,[62] as well as Austria, Italy, and the Far East. The first US nutrition survey teams to reach the major cities of Holland (before the fall of Germany), for example, found a very thin and hungry people, who had suffered an average weight loss of 25 lbs. "Extreme emaciation and cachexia were common."[63(p138)] With the occupation of Germany, continuous appraisals and recommendations from the American nutrition survey teams were made

> in terms of minimal requirements for the prevention of disease, maintenance of reasonable standards of health, the maintenance of output of essential work, and the prevention of civil unrest which might be prejudicial to the occupying force.[64(p48)]

Readjustments in the international food commitment policy and a decrease in the amount of food available for distribution resulted in a ration cut in April 1946 and demonstrated just how precarious these "minimum requirements" were. The average body weights for adult men and women, which were already below the US standard, declined significantly within 30 days.

> In May 1946 serious malnutrition existed in Germany. Children could not grow properly, essential work could not be performed, and the aged and many other normal consumers were faced with starvation unless more food became available.[64(p51)]

Monthly street weighings of the civilian population showed that the low point in average adult body weight came in the second quarter of 1947. By January 1949, feeding programs had made such progress in restoring body weight that street weighings were discontinued.[65]

Infectious Diseases

German cities such as Cologne had been destroyed by extensive bombing and shelling. Water mains and sewer pipes 20 ft below the surface were ripped open in some of the strategic bombing.[66,67] During the harsh winter of 1945 to 1946, people found themselves severely crowded in the buildings that remained. In some cities, they had "as little as 28 square feet of floor space per person—just sufficient to permit a person to lie down."[68(p143)] Public health authorities were acutely aware of the transmission of respiratory diseases under these conditions. A lack of adequate housing still remained as a grave threat to the public's health as late as 1949.[61] War damage to the water and sewer systems resulted in epidemics of typhoid fever and dysentery through 1947, though the situation improved with the emergency use of chlorination.

Typhus, which was thought to have killed over 3 million people in the Balkans and Ukraine dur-

ing and after World War I, had been introduced to Germany from the east by returning soldiers, forced laborers, and transports to concentration camps.[69] Heavily seeded with infection, the Rhineland was the site of explosive outbreaks in the spring of 1945. Many of the methods used in Italy worked in Germany: finding and isolating cases and mass delousing with DDT powder.[60] Over 15,800 cases of typhus from 518 locations were reported east of the Rhine river from March to June 1945. To protect Allied countries west of the Rhine, the Supreme Headquarters, Allied Expeditionary Force erected a *cordon sanitaire* for typhus control measures at all river crossings, entraining points, and airfields. (This tactic was also used successfully in Vienna to stop an epidemic of typhus there.[70]) All civilians and liberated prisoners of war travelling east to west were deloused at these points and given an endorsement on their identification papers. Individuals suspected of being sick with typhus were observed until diagnosed and given appropriate disposition. Personnel frequently exposed to typhus were immunized. By mid-July 1945, typhus was under control.[60]

Displaced Persons

As of October 1943, it was estimated that there were 21 million displaced persons (DPs) in Europe, mainly in Germany or in territory annexed by the Reich.[69] Ultimately, there would be 4.2 million DPs in the American occupation zone. Early in the occupation of Germany west of the Rhine, even before surrender, Military Government Public Health Officers supervised sanitation in the DP and refugee camps, while coordinating public health measures and communicable disease control activities (Figure 3-2). During the Allied period of rapid advance east of the Rhine, 50,000 combat and support troops of the 6th and 12th Army Groups became involved by necessity in the care, control, and repatriation of 4 million DPs.[60]

None of this prepared Allied personnel for the horror they would find in the numerous Nazi concentration camps. Among the atrocities found were human experimentation, forced labor, starvation, crowded unsanitary living conditions, and rampant disease. It is estimated that between 18 million and

Fig. 3-2. In the aftermath of World War II, Europe held more than 21 million displaced persons, many of whom carried infectious diseases with them as they sought to return to their homes. Here Dutch refugees receive DDT dusting to kill the lice that transmit typhus. Photograph: Courtesy of the National Museum of Health and Medicine, Armed Forces Institute of Pathology, Catalog No. NCP 1965.

26 million people died in these camps from 1939 to 1945.[71] Public health and medical officers from the Military Government played a key role in trying to save and care for hundreds of thousands of inmates found still alive. In response to the extreme state of advanced starvation among the inmates, these officers mounted an emergency feeding program, which included intravenous feeding for those who were no longer able to take food by mouth.[60] More than half of the concentration camp inmates suffered from advanced tuberculosis. Typhoid fever and dysentery were widespread.[60,72] Typhus was rampant among the inmates, while louse infestation was universal; it was thought that the typhus epidemics in Austria were started by inmates. (It was at Bergen-Belsen that Anne Frank and her sister died of typhus, a matter of weeks before the camp was liberated.[73]) As in Italy, the American Typhus Commission took charge and brought the epidemic under control.[74] Since many inmates were too weak to move, the Allies found themselves operating the camps until the inmates were adequately restored to health.[60]

Local Involvement

From the start, Military Government policy made civil government (including public health) in Germany a civilian responsibility. This decision was made with the knowledge that German civil authorities would need a considerable amount of help. Military Government officials hoped to move as quickly as possible from operational control of civilian public health programs to a more advisory or supervisory role. Civil public health officers of the Military Government were expected to

> appraise a given situation, outline a few clear and practical objectives, organize and direct local health and medical personnel, and assist in obtaining medical supplies essential to the program. Except under unusual circumstances, for a public health officer to attempt to treat patients or to operate a clinic would be a misdirection of energy.[9(p132)]

Denazification of the German health care system was said to have

> removed nearly 95% of the experienced public health officers, nearly 85% of hospital staff personnel, and, in some areas, more than 50% of the doctors from private practice.[68(p143)]

Nonetheless, the German civilian public health system was gradually restored to reflect the same general objectives and procedures found in federal, state, municipal, and local public health departments in the United States. After 4 years of occupation and with a staff of 13 (down from the original 177 in 1945), Lieutenant Colonel Walter R. deForest, who was responsible for public health, wrote:

> Constantly until January 1948, it seemed as if we were just one step ahead of disaster. By that date the German State Public Health Departments were functioning satisfactorily in the United States Zone.[65(p32)]

Free elections in the combined French, British, and American zones in 1949 resulted in the recognition of the new nation, the Federal Republic of Germany, and the formal end of military government.

Okinawa, Japan, and Korea

Okinawa

In preparing for the invasion of Okinawa, US military government planners made the most of the lessons learned in Europe. The primary goal of Military Government during the combat phase would be to keep civilians out of the way of US fighting units. Priority would be given to preventing those diseases and conditions that might endanger the health of occupying troops. Unlike in Europe, civil affairs (CA) and Military Government would involve Navy as well as Army personnel. A full description of the CA units and Military Government on Okinawa can be found elsewhere.[75] The Allied attack on Okinawa commenced on April 1, 1945. By April 30th, 125,000 civilians were in refugee camps run by the Military Government. Compared with the Okinawans who had taken refuge in hillside caves and had a high incidence of impetigo, scabies, lice infestation, and pulmonary tuberculosis,[75] the health of the people in these camps was good. Strict preventive medicine measures in the camps and an educational program emphasizing personal hygiene and sanitation are credited with preventing serious epidemics.

The campaign for Okinawa officially ended July 2, 1945 after an enormous loss of life on both sides (12,000 Americans and more than 100,000 Japanese killed). Military Government officers made maximum use of Okinawan medical personnel and facilities to provide for the public health needs of the Okinawans. In 1952, Military Government was transformed into a civil administration with the creation of the Government of the Ryukyu Islands. For years thereafter, military preventive medicine and civilian

public health activities were closely coordinated.[76,77] Okinawa was fully restored to Japan in 1972.

Japan

Japan's surrender on August 10, 1945, meant that US forces proceeded unopposed in their occupation of the main islands. A Public Health and Welfare Section, under the direction of Brigadier General Crawford F. Sams, MC, was established.[78] This section was organized "similar to that of any large modern state or territorial health department."[79(p634)] As Supreme Commander for the Allied Powers (SCAP), General MacArthur exercised his authority through the various ministries of the Japanese government and through the Emperor himself.[52,80] Within this framework, the Public Health and Welfare Section of General Headquarters, SCAP, directed government public health policy. For example, under the direction of Brigadier General Sams and under the authority of the SCAP, the Public Health and Welfare Section directed the Japanese Ministry of Health and Welfare to[80(pp669–670)]

- Initiate immediate surveys of disease prevalence, health care facilities, and medical supplies by prefecture,
- Initiate a communicable disease program that includes weekly reporting, disease control activities, and immunizations,
- Restore public sewer, water, and waste and garbage disposal systems,
- Reopen civilian hospitals, sanatoria, and leprosaria,
- Distribute Japanese military medical supplies and foodstuffs to the indigenous population,
- Inaugurate port quarantine control,
- Reopen or restore civilian public health laboratories,
- Expedite the collection, analysis, and reporting of vital statistics data, and
- Control venereal disease.

Even before the war, Japanese standards of sanitation had been far below those of Western societies. Water and sewer systems existed only in the larger cities and had been severely damaged by bombing.[79] According to the US Strategic Bombing Survey, 40% of the built-up areas of 66 Japanese cities was destroyed, and approximately 30% of the urban population was homeless.[81] A growing food shortage was clearly the greatest crisis facing the nation.[82]

> The resources of [Japan during the war] had been used to support the activities of the Army, and the food of the civilian population had been officially restricted from the beginning of the war to approximately the basal metabolic level and had become so short that scientists were trying to determine how much farther the ration could be lowered without curtailing the ability of the people to support the [Japanese] Army.[83(p694)]

MacArthur ordered a report on the condition of the populace. This was accomplished through

> (a) a review of autopsy reports of persons dying in public places, (b) obtaining reports from the Ministry of Welfare of deaths caused by malnutrition, and (c) institution of nutrition surveys (and physical exams).[83(p694)]

The incidence of smallpox increased throughout the war years in Japan. Despite 60 million people being immunized in the first 4 months of occupation, 17,800 cases of smallpox occurred in 1946. It was soon discovered that the technique of vaccination had been faulty—virus had been applied to the arm while it was still wet with alcohol. Seventy-five million people were revaccinated, bringing the epidemic to a halt. Only 29 cases were reported in 1948.[79] The US occupation troops did not escape unscathed. Of the 61 "previously vaccinated" servicemen who developed the disease, 21 died, prompting a rigorous revaccination program among the US forces also.[84] Noted military historian Albert Cowdrey stated it well:

> American and Japanese health were interdependent, and the occupation authorities were obliged to improve the second in order to safeguard the first.[84(p47)]

As in postwar Europe, sexually transmitted disease (STD) loomed as an enormous problem for both the military and civilian communities. A campaign of health information for military personnel, placing red-light districts off limits, and outlawing prostitution (for the first time in Japan's history), did not seem to be sufficient to curb a STD rate that peaked at 150 cases per 1,000 troops per year in October 1946.[84] On the military side, STD control became a command responsibility, with coordination of program elements by the 8th Army's chief of preventive medicine. SCAP directed the Japanese government to require the reporting of venereal diseases; to establish STD control ordinances for each prefecture, including weekly examinations for prostitutes and bar girls; to treat those infected with

Fig. 3-3. Japanese health care workers are seen here dusting civilians with DDT in Tokyo's Komagoma Typhus Hospital in response to a widespread epidemic of typhus in December 1946. Photograph: Courtesy of the National Museum of Health and Medicine, Armed Forces Institute of Pathology, Catalog No. SC 287,308.

penicillin; and to set up training courses for laboratory and STD clinic staff. STD rates among personnel did moderate through the first half of 1947, yet the problem remained for the duration of the occupation.[84]

An epidemic of typhus in late 1945 led to the immunization of more than 8 million people and the dusting of 48 million with DDT powder (Figure 3-3). By 1948, the number of cases had fallen to less than 500, from over 31,000 in 1946. With the introduction of a new diphtheria vaccine and the vaccination of 18 million children, the morbidity rate for this disease dropped by 73% from 1945 to 1948. In similar fashion, a typhoid fever immunization program was started at this time. Cholera was kept in check largely by stringent quarantine measures focused on Japanese citizens returning from foreign countries. A nationwide BCG (bacille Calmette-Guerin) vaccination program started in 1946 is credited with reducing the tuberculosis mortality rate 36% by 1948. A country-wide effort to reduce the incidence of dysentery taught individuals about the importance of sanitation and personal hygiene. Particular efforts were made to discourage the centuries-old practice of using night soil (human excreta) for fertilizer. In addition, in the spring of 1946, 9,000 trained and equipped six-man sanitation teams were assigned throughout the country so that every health district had its own team. The improvement in the safety of drinking water alone probably accounted for the 87% drop in the incidence of dysentery by 1948.[78,79]

After the adoption of a new constitution by the Japanese government and the signing of a peace treaty with the United States, which took effect April 28, 1952, Japan regained its full sovereignty and the military occupation formally ended.

Korea

The US troops who arrived in Korea after the surrender of Japan found no local indigenous government with which to work. The Japanese government had annexed the Korean peninsula in 1910 and had never allowed Koreans to occupy positions of leadership. The same was true of the nation's health care system. Virtually all key medical professional personnel had been Japanese, and they had all left. The public health infrastructure, in particular, was crippled. It was into this

void that US Military Government stepped in 1945.[80]

The Headquarters, US Army Military Government, in Korea was formally established in January 1946. A Bureau of Public Health (later the Department of Public Health and Welfare) was quickly established. This department was staffed with 50 officers and 30 enlisted men from both the Army and the Navy. Provincial and community health departments were also established shortly thereafter. To fill the professional vacuum, the Military Government quickly instituted a 6-week training course in public health at Seoul University. Twenty-two students had completed this training by January 1946. In addition, the military worked with the Rockefeller Foundation to sponsor 10 Korean physicians in the study of public health.[80]

Although no fighting (and therefore no destruction of buildings) had occurred in Korea during World War II, the country shared many of the same sanitation and disease problems as postwar Japan. Water supplies were often polluted. Mosquitoes and flies were everywhere. As in Japan, night soil served as the chief fertilizer. Smallpox, cholera, typhus, typhoid fever, dysentery, and malaria were all endemic. Tuberculosis was common, killing 45,000 annually. Infant mortality stood at 300 per 1,000 live births, with half of all children dying before they reached the age of 5 years.[80]

So deep were the disease problems of Korea, so primitive was the people's lifestyle, and so few were the public health resources that the Military Government was able to conduct, at best, a holding operation during the occupation years. With few resources at their disposal, Army doctors primarily responded to epidemics "in the face of almost heartbreaking difficulties."[84(p57)] Recipients of the same "vaccination" program as pre-1945 Japan, Korea reeled from a smallpox epidemic in the winter of 1945 to 1946, which peaked at 19,809 cases in April. Typhus, also epidemic during these months, caused almost 6,000 cases and peaked with 1,064 cases in April. Despite the efforts of the American Typhus Commission to suppress the disease, typhus recurred the following winter (1946–1947), with 1,183 cases by May 1947. Koreans being repatriated from China were thought to have sparked a cholera epidemic in the summer of 1946 that resulted in 15,642 cases and 10,191 deaths. Nationwide efforts at immunization and sanitation followed all of these outbreaks. In addition to these outbreaks, two particular disease problems for occupation troops were malaria and venereal disease.[80]

The declaration of the Republic of Korea (South Korea) in August 1948 brought to an end 3 years of military government.

SUMMARY

This chapter has just scratched the surface in discussing the historic role of preventive medicine and public health in US armies of occupation and military government. In the aftermath of four major US wars, military preventive medicine personnel have distinguished themselves in protecting the health of US military occupation forces; providing organized, life-saving relief and epidemic disease control for suffering civilians in devastated, war-torn countries; and establishing or reestablishing sustainable civil government public health systems.

Public health is a vital and pressing function within military government, and it is most effectively delivered by well-trained and experienced military preventive medicine personnel and civilian public health officers assigned to work with the military. Within military government, the goals of preserving the health of the occupying personnel and improving the lot of a distressed civilian population are inextricably interdependent. Recognizing this, it is incumbent on medical professionals in the armed forces to ensure that preventive medicine personnel are well trained and ready to step forward when called on to serve with occupation forces and military government administrations in the future. The reputation of the United States as a humanitarian nation and its military heritage of professionalism demand the best.

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