

## Influenza Deaths in Hawai'i, 1918–1920

LARGELY FORGOTTEN TODAY, the worldwide influenza pandemic of 1918–1920 killed more than 21 million persons, including at least 675,000 Americans and more than 2,300 people just in Hawai'i. The average length of life in the United States fell from 54.5 years in 1915 to 39.1 years in 1918. The pandemic received surprisingly little attention at the time and has been largely ignored by many historians until quite recently.<sup>1</sup>

This relative indifference to the pandemic was especially marked in Hawai'i. Standard histories such as Ralph S. Kuykendall's *Hawaii in the World War*, Gavan Daws's *Shoal of Time*, and Helen Gay Pratt's *Hawaii, Off-Shore Territory* make no mention at all of influenza.<sup>2</sup> Neither does Dr. C. B. Wood's article on the history of medicine in Hawai'i.<sup>3</sup> Only brief references appear in Thrum's *Almanacs* and annual governmental reports for 1918–1920, like the yearly reports of the governor and Board of Health and the Census Bureau's *Mortality Statistics*.<sup>4</sup> Kuykendall and Day's *Hawaii: A History* mentions the pandemic only in passing, in connection with the 1920 sugar strike.<sup>5</sup> The ubiquity of such omissions is a major reason for this article: the epidemics of 1918–1920 deserve greater recognition.

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## THE NATURE OF INFLUENZA

Influenza is one of the most widespread serious causes of morbidity and mortality in humans. It was first described by Hippocrates in 412 B.C., and epidemics have occurred somewhere in the world every one to three years. In the northern hemisphere the peak season for influenza is between December and April. It attacks all parts of the population, but serious infections are commonly found in the young, the debilitated, and the elderly.<sup>6</sup>

Most of the infections of influenza are transmitted through human-to-human contact from viral particles in respiratory secretions. Viruses that are aerosolized and inhaled invade the new host, causing inflammation of the respiratory system and a watery discharge.

Three types of influenza have been serologically identified: influenza A, B, and C, which are differentiated from the viral infections of the common cold, pneumonia, and other respiratory illnesses. Influenza A was considered the type of virus that produced the 1918 epidemic in Hawai'i.<sup>7</sup>

Symptoms of influenza appear after a brief incubation period of one to three days after exposure. An inflammation of the nose and throat is often accompanied by a dry cough, and many patients experience systemic symptoms of fever, headache, muscle aches and general malaise. In most cases the acute illness subsides in three to five days, although a cough and fatigue may continue for several weeks.<sup>8</sup>

In more severe cases there may be complications, including heavy cough with difficult breathing, high fever and systemic toxicity from primary viral pneumonia, muscle inflammation, rapid breathing with circulatory distress, and cardiopulmonary failure. The disease may be particularly injurious to infants and young children, asthmatics, persons with cardiopulmonary disease, and the elderly. Secondary infections such as bronchitis and bacterial pneumonia are common.<sup>9</sup>

## WORLDWIDE AND U.S. TRENDS

The so-called Spanish influenza (also known as *la grippe*) swept around the world in three or four major waves in 1918, 1919, and 1920. It made its earliest recorded appearance in the United States

in March 1918; Alfred Crosby's detailed account notes that "pneumonic complications were few and deaths fewer." The second wave was far worse; called "a killer," it caused many deaths and circled the globe in less than five months.<sup>10</sup>

"In late August [1918] the influenza virus changed suddenly into the most dangerous strain (or strains) of that organism of which we have any record," Crosby continues. The third wave "was less virulent and deadly than the second. It sent hordes more to their sick beds and a considerable number of them to their graves before finally abating in the spring of 1919, but the death rate per thousand of population was only half that of the peak week of round two."<sup>11</sup>

"It should be noted that some consider the influenza epidemic of 1920, which gave the United States its third worst flu year in this century, to be the fourth wave of the pandemic," according to Crosby.<sup>12</sup> The 1920 epidemic is indeed combined with the 1918-1919 pandemic in the present analysis.

#### THE PANDEMIC STRIKES HAWAI'I

The first cases seen on O'ahu showed up at the island's military and naval bases at the end of June 1918. A headline in the *Honolulu Star-Bulletin* on July 1 announced "600 Soldiers at Schofield Down With La Grippe." The article added: "More than 1,200 soldiers, sailors and civilians . . . are victims of an epidemic of influenza which broke out last week." Enough pineapple workers called in sick to make it "necessary to muster in the children to help with the work."<sup>13</sup> In a July 3 item headed "Honolulu Likely to Be Victim of Grippe Epidemic," a Fort Shafter physician was quoted as saying that "civilian physicians are already beginning to report cases, and they are likely to increase in number for quite a time. . . . There is little enough one can do in the nature of preventive treatment. Keep away from 'grippees' as much as possible and rinse the mouth and nostrils with germ-destroying lotions as often as possible. Otherwise it's largely a question of luck."<sup>14</sup>

Kaua'i's initial experience with the pandemic apparently occurred soon thereafter, although the exact date is uncertain. An article on the "Flu Epidemic of 1917," written thirty-nine years after the fact by

the physician at Makaweli Plantation, appears to give a misdating of Kaua'i's experience, as occurring in 1917 rather than 1918.<sup>15</sup>

The first wave of the 1918 pandemic (attributed to shipping from Japanese and Chinese ports) quickly rolled over O'ahu, lasting through July and into August. The second wave arrived the following December and January and spread throughout the territory.<sup>16</sup>

These viral onslaughts occurred during the months when World War I was nearing its climax, and the war effort was receiving the highest possible national priority. Many Hawai'i physicians had volunteered for military service, sometimes leaving sizable districts without any professional care.<sup>17</sup>

There were severe shortages not only of physicians but also of hospital beds, nurses, and other medical personnel and facilities, thereby forcing the adoption of numerous stopgap measures. In January 1919, the press reported that The Queen's Hospital (the largest such institution in the territory) had been turned into a general hospital for influenza cases.<sup>18</sup> Health officials frequently requested help from the U.S. Army Medical Department, already heavily burdened with its own caseloads.<sup>19</sup> Pa Ola Day Camp of Palama Settlement, with eighteen beds, and smaller facilities at Quarantine (Sand) Island and the Lihue Armory were used as emergency hospitals for influenza cases.<sup>20</sup> A women's committee was formed to inspect schools and supply medicine to pupils with colds, and former nurses were recruited to inspect schools for flu cases.<sup>21</sup>

Many mainland communities had closed schools, theaters, and churches as public health measures during the pandemic, and Island health officials were urged to do the same. They mostly resisted such suggestions, arguing that experience elsewhere showed closure to have little or no effect on death rates; moreover, keeping schools open enabled officials to monitor students' health more effectively and follow up on sick pupils sent home.<sup>22</sup>

Eventually some businesses and institutions temporarily closed. Thomas G. Thrum noted: "Public gatherings, at least indoors, including church services, were prohibited, though schools remained open but under watchful care."<sup>23</sup> Several private schools—among them Kamehameha, St. Andrew's Priory, and St. Louis, as well as the Girls' Industrial School—closed for varying periods.<sup>24</sup> All theaters (except for "enclosed theaters with dirt floors") reopened February 17, 1919.<sup>25</sup>

## STATISTICAL LIMITATIONS

Statistics of the pandemic seem to be in some disarray. Although mortality data were routinely collected throughout the pandemic, morbidity statistics were unavailable before October 21, 1918. On that date, by a resolution of the Territorial Board of Health, influenza became a reportable disease.<sup>26</sup> During the first calendar year for which figures on flu cases were compiled, 1919, total cases numbered 12,499.<sup>27</sup> This total may understate the actual number: influenza morbidity has typically been subject to proportionately more under-reporting than flu mortality.

It should also be stressed that national statistics and comparisons for this period are seriously affected by the fact that many states were not yet part of the U.S. death registration area. That area, limited to states and cities with reasonably complete reporting of mortality data, included only 78.5 percent of the estimated U.S. population (excluding Hawai'i) in 1918, 81.1 percent in 1919, and 82.2 percent in 1920.<sup>28</sup> Hawai'i, although still omitted from national totals and reported only in separate tables, was finally admitted to the death registration area in 1917. A test conducted by the U.S. Bureau of the Census in 1918 found that 98 percent of all deaths occurring in Hawai'i were officially reported.<sup>29</sup>

Another statistical problem is non-comparability of morbidity and mortality data, since morbidity figures generally omit cases of pneumonia which were often the ultimate outcome for influenza patients. As observed by Bureau of the Census analysts,

In studying the effects of the pandemic of influenza it is not believed to be best to study separately influenza and the various forms of pneumonia, bronchitis, and the respiratory diseases, for doubtless many cases were returned as influenza when the deaths were caused by pneumonia, and vice versa. The best method therefore seems to be to study as one group deaths from influenza and pneumonia (all forms), disregarding deaths from the other respiratory diseases, which were comparatively few.<sup>30</sup>

Annual data on each separate cause of death appear in table 1, for both the U.S. death registration area and Hawai'i, 1917 through 1921. In other tables of this paper, the specific causes are combined.

It should also be noted that tabulations for the war years, 1917 and 1918, exclude military deaths. All of the statistics moreover are on a place of occurrence (and not place of residence) basis.

#### COPING WITH THE EPIDEMIC

Daily newspapers frequently carried articles of advice, provided by public health officials, on the treatment of flu patients. One such article, for example, urged readers to

avoid public gatherings. . . . In case of headache, general indisposition followed by fever, congestion of the face, beginning coughs and marked prostration, go home and go to bed. If there is no cessation of the ailment, call a physician immediately. Keep children away from other children who have coughs or colds. Avoid places of public amusement; in fact, any place where one might be likely to come in contact with the disease. Persons having a cough or cold should isolate themselves from other members of the family.<sup>31</sup>

Another article was headed "Influenza, How to Avoid It, How to Care for Those Who Have It, What to Do Until the Doctor Comes." This article suggested:

Insist that whoever . . . enters the sickroom . . . shall wear a gauze mask, which may be made of four or six folds of gauze which should cover the nose and mouth and be tied behind the head. Remember that these masks must be kept clean, must be put on outside the sickroom, must not be handled after they are tied on and must be boiled thirty minutes and thoroughly dried every time they are taken off.<sup>32</sup>

Still another article, headlined "Board of Health Tells How to Avoid Flu," advised: "Keep your hands clean. Don't shake hands—salute or bow. . . . Avoid violent exercise, chills, and cold drafts. . . . Walk to your work, if not far."<sup>33</sup>

Public pronouncements from health officials were often quite optimistic. As late as October 1918, for example, the chief quarantine officer of the U.S. Public Health Service in Honolulu was still expressing "no reason to feel alarmed over the influenza situation"

Table 1. Deaths and Death Rates from All Causes, Influenza, and Pneumonia for the U.S. Death Registration Area and Territory of Hawai'i, 1917-1921

Subject and Year	Total, All Causes	Influenza and Pneumonia			
		Total	Influenza	Broncho- pneumonia <sup>1</sup>	Lobar pneumonia <sup>2</sup>
Number of deaths, U.S.D.R.A. <sup>3</sup>					
1917 <sup>4</sup>	1,066,711	125,361	12,965	37,879	74,517
1918 <sup>4</sup>	1,445,158	456,670	234,290	54,697	167,703
1919	1,096,436	189,326	84,113	40,720	64,493
1920	1,142,558	182,205	62,097	47,746	72,362
1921	1,032,009	88,456	10,193	34,889	43,374
Number of deaths, Hawai'i					
1917 <sup>4</sup>	3,710	447	44	273	130
1918 <sup>4</sup>	3,885	615	109	298	208
1919	3,876	796	325	218	253
1920	4,600	1,489	866	312	311
1921	3,924	550	64	337	149
Death rate per 100,000, U.S.D.R.A.					
1917 <sup>4</sup>	1,423	167	17	51	99
1918 <sup>4</sup>	1,777	562	288	67	206
1919	1,287	222	99	48	76
1920	1,306	208	71	55	83
1921	1,164	100	11	39	49
Death rate per 100,000, Hawai'i					
1917 <sup>4</sup>	1,566	189	19	115	55
1918 <sup>4</sup>	1,596	253	45	122	85
1919	1,488	306	125	84	97
1920	1,764	571	332	120	119
1921	1,444	202	24	124	55

<sup>1</sup> Includes capillary bronchitis for 1921.

<sup>2</sup> Includes unspecified pneumonia in all years.

<sup>3</sup> The U.S. Death Registration Area covered 73.4 percent of the population in 1917, 78.5 percent in 1918, 81.1 percent in 1919, and 82.2 percent in 1920 and 1921.

<sup>4</sup> Data exclude deaths among armed forces during World War I.

Source: Hawai'i rates based on population estimates in *Historical Statistics of Hawaii* (1977), pp. 43-45. Other data from U.S. Bureau of the Census, *Mortality Statistics*, 1917-1921.

and doubting there was “such a thing as a real epidemic.”<sup>34</sup> The Territorial sanitarian likewise denied the existence of an epidemic.<sup>35</sup> Several weeks later, officials claimed—quite prematurely as it turned out—that “the influenza epidemic in Honolulu has been virtually stamped out, and that it is not likely to recur.”<sup>36</sup>

Meanwhile, over-the-counter remedies and non-medical methods were touted in newspaper ads. One read: “Chiropractic for ‘Flu!’ Last year Chiropractors established the wonderful record of *only one death* in every 886 cases of ‘flu.’ Call a Chiropractor early, and GET WELL!”<sup>37</sup> Hollister Drug Co. advertised, “Your Health will be protected against the dreaded Influenza Germ By the timely use of ZE PYROL, the safe Antiseptic, as a THROAT GARGLE OR NASAL SPRAY.”<sup>38</sup>

The pandemic occurred soon after prohibition went into effect in the Islands, and many residents still believed in the therapeutic qualities of alcohol. So, apparently, did the collector of internal revenue for the Hawai‘i District; in February 1920, he instructed his staff to allow the distribution of liquor to responsible physicians for use with influenza patients.<sup>39</sup>

The pandemic also took place in a time of serious labor unrest, which culminated in the great sugar strike of 1920.<sup>40</sup> According to Kuykendall and Day, “Management responded by evicting 12,000 strikers [from plantation housing]. About half of these came to Honolulu, which was in the throes of an influenza epidemic; and it was estimated that 1,200 members of strikers’ families died of this disease.”<sup>41</sup> In February, 28 influenza cases were counted among the 700 Filipino strikers and their families who had been crowded into the old Japanese sake brewery on Quinn Lane. There were eight cases of flu in one Chinese family on Beretania Street and six cases in another. In spite of public pressure and editorial outrage, the Board of Health decided not to prevent an influx into Honolulu of striking plantation workers “who may decide tomorrow to quit the plantation camps, where many of them have been living since the beginning of the walkout, instead of returning to their jobs.” A *Star-Bulletin* editorial grumped that “further influxes of striking plantation workers should not be tolerated” and that we should try “cleaning up the insanitary Oriental districts.”<sup>42</sup> Meanwhile, strikers occupying temporary camps reportedly experienced “rampant” influenza and pneumonia.<sup>43</sup>



Even before the 1920 strike exacerbated urban congestion, slum housing had been implicated in the spread of influenza and other diseases. Dwellings were badly crowded, both in Honolulu and the plantation camps; "in each tenement there are between 20 and 30 rooms and some of them are used by families of from one to five and six children, outside of their chickens, dogs and cats," wrote one observer.<sup>44</sup>

Even remote areas on the Neighbor Islands did not escape the pandemic. In its only published reference to the flu, *Paradise of the Pacific* described the experiences of John Lydgate who in April 1919 had volunteered to survey influenza cases in Hule'ia Valley and Niu-malu in eastern Kaua'i. "I was given a thermometer with the simple instructions that anything over 100 degrees was to be sent to the hospital," he recorded. "At first the rural dwellers in that secluded valley, shut off from the rest of the world, laughingly, or even jeeringly, scouted the idea that any such epidemic disease could come to them, and also scouted the idea of making daily inspection." Inevitably flu came, and community attitudes quickly changed.<sup>45</sup>

#### DEATH RATES PEAK

Progress of the pandemic both nationally and in the Islands can be charted from official statistics (see tables 1 and 2). In 1917, the last "normal" year before the pandemic, about 125,000 persons died in the United States from flu-related causes—13,000 from influenza, 38,000 from bronchopneumonia, and over 74,000 from lobar and unspecified pneumonia. The next year these three subgroups killed 457,000 persons, including 234,000 from influenza alone. The combined deaths then dropped to 189,000 in 1919, 182,000 in 1920, and 88,000 in 1921. Hawai'i peaked in 1920, two years after the Mainland. (The reasons for this lag remain unclear.) Island deaths from the three related causes rose from 447 in "normal" 1917 to 615 in 1918, 796 in 1919, and 1,489 in 1920, before falling to 550 in 1921. Influenza accounted for 866 of the 1920 Hawai'i deaths, compared with 623 deaths from the two types of pneumonia.

Death rates per 100,000 estimated population are of course much more revealing than numerical totals, especially when comparing

one small territory with the entire U.S. registration area. In the worst flu year for the entire nation, 1918, civilian mortality from flu and pneumonia reached 562 per 100,000, compared with only 167 in the last full year before the pandemic. The peak rate per 100,000 for Hawai'i was 571 in 1920, as against 189 in 1917. Annual rates appear in table 1 and are shown graphically in the accompanying chart.

Monthly mortality totals reveal how slowly the pandemic reached the territory, in comparison with the U.S. death registration area (see table 2). Nationally, total deaths from flu and pneumonia soared from 2,804 in August 1918 to 193,865 two months later, slowly subsided to a low of 2,809 in August 1919, and then peaked again at 71,507 in February 1920. In Hawai'i, in contrast, monthly deaths remained in two digits throughout 1918, rose to a February 1919 spike of 211, fell to fewer than 100 per month for the last nine months of 1919, and then jumped abruptly to an all-time high of 602

Table 2. Deaths from Influenza and Pneumonia for the U.S. Death Registration Area and Hawai'i, 1918-1920

Month	U.S. Death Registration Area			Hawai'i		
	1918	1919	1920	1918	1919	1920
Annual total	456,690	189,326	182,205	615	796	1,489
January	18,189	61,675	24,904	58	106	81
February	16,116	33,370	71,507	66	211	311
March	18,918	31,332	27,276	57	178	602
April	20,552	17,394	12,120	59	70	177
May	9,985	9,448	9,214	54	35	47
June	4,416	4,219	4,860	28	28	31
July	3,640	3,195	3,148	92	19	32
August	2,804	2,809	2,883	55	30	37
September	12,226	3,427	3,352	29	26	32
October	193,865	4,883	5,112	26	24	30
November	86,899	6,861	7,401	42	35	47
December	69,080	10,713	10,428	49	34	62

*Note:* Excludes deaths among U.S. armed forces during World War I. Includes deaths from influenza and bronchopneumonia, lobar pneumonia, and unspecified pneumonia.

*Source:* U.S. Bureau of the Census, *Mortality Statistics* (annual report).

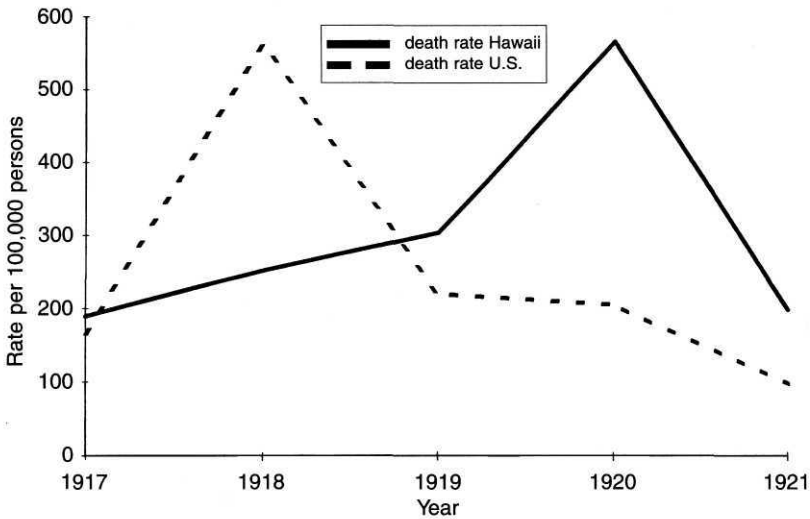


FIG. 1. Death rates from influenza and pneumonia for the Territory of Hawai'i and the United States, 1917-1921. U.S. figures are for the death registration area (see table 1, note 3).

in March 1920. In monthly as well as annual mortality, the Islands were lagging the Mainland by fully two years.

Federal statisticians drew the obvious conclusions from these monthly tabulations. At first they observed: "The small number of deaths [in Hawai'i] for each of the last four months of 1918 as compared with the corresponding months of 1917 is in striking contrast with figures for the rest of the registration area where the pandemic of influenza was raging in the latter part of 1918." A year later: "The mortality figures by months for influenza and pneumonia (all forms) indicate that the full force of the influenza epidemic did not reach Hawaii until January, 1919. . . ." After another twelve months: "The figures for influenza and pneumonia (all forms) clearly show that the influenza epidemic of 1920 [in Hawai'i] was more fatal than the pandemic of 1918 and 1919, the mortality rate from these causes in 1920 being 574.4 per 100,000 population as against 315.1 in 1919 and 258.1 in 1918."<sup>46</sup> (Somewhat different rates shown in table 1 reflect the use of revised population base estimates in that table.)

Annual data tabulated by age, sex, race, and geographic area reveal

wide variations in susceptibility to influenza and pneumonia (see tables 3 and 4). For the two-year period centered on the 1920 Census, average annual death rates for these causes per 1,000 population in Hawai'i were highest for children under five years of age and persons sixty and over and lowest for those between five and nineteen. By

Table 3. Deaths in Hawai'i from Influenza, Bronchopneumonia, and Lobar Pneumonia by Age, Sex, Race, and County, 1917-1921

Subject	1917	1918	1919	1920	1921
Total	447	615	796	1,489	550
Age					
Under 5 years	294	360	274	482	364
5 to 19 years	24	35	86	146	27
20 to 39 years	38	96	270	527	65
40 to 59 years	44	74	112	247	57
60 years and over	47	50	54	85	36
Age not reported	—	—	—	2	1
Sex					
Male	273	346	440	840	See note 2
Female	174	269	356	649	See note 2
Race					
Hawaiian	127	186	155	369	122
Part-Hawaiian	See note 1	47	36	84	48
Caucasian	51	77	107	197	74
Chinese	29	35	44	108	35
Japanese	149	185	311	553	178
Filipino	See note 1	74	126	157	79
Others	91 <sup>1</sup>	11	17	21	14
County					
Honolulu	211	311	379	833	305
Hawai'i	108	134	155	296	120
Kaua'i	49	47	121	210	29
Maui (inc. Kalawao)	79	123	141	150	96

Note: Excludes deaths among U.S. armed forces during World War I. Includes deaths from unspecified types of pneumonia. All data are on a place-of-occurrence basis.

<sup>1</sup> Part-Hawaiians and Filipinos combined with "other races" in 1917.

<sup>2</sup> Sex not tabulated for 1921.

Source: U.S. Bureau of the Census, *Mortality Statistics* (annual report).

race, flu deaths were exceptionally high for pure Hawaiians, less so for Filipinos, and lowest for Caucasians. Male and female rates differed but little. By counties, Kaua'i reported the highest rate, followed by O'ahu, Maui, and the Big Island. Why the influenza death rate followed such a distinct geographic pattern, dropping regularly from west to east, is an unanswered question.

Table 4. Death Rates per 1,000 Population from Influenza and Pneumonia, for Hawai'i, by Age, Sex, Race and County, 1919-1920

Subject	Resident population, Jan. 1, 1920	Average annual deaths, 1919-1920	Death rate per 1,000 population
Total	255,912	1,142	4.46
Age			
Under 5 years	38,550	378	9.81
5 to 19 years	72,900	116	1.59
20 to 39 years	85,855	398	4.64
40 to 59 years	48,824	180	3.68
60 years and over	9,670	70	7.19
Age not reported	113	1	...
Sex			
Male	151,146	640	4.23
Female	104,766	502	4.80
Race			
Hawaiian	23,723	262	11.04
Part-Hawaiian	18,027	60	3.33
Caucasian	54,742	152	2.78
Chinese	23,507	76	3.23
Japanese	109,274	432	3.95
Filipino	21,031	142	6.73
Others	5,608	19	3.39
County			
Honolulu	123,496	606	4.91
Hawai'i	64,895	226	3.47
Kaua'i	29,438	166	5.62
Maui (inc. Kalawao)	38,052	146	3.82

Source: 1920 U.S. census, cited in *Historical Statistics of Hawaii* (1977), pp. 13, 20, 22, 25; table 3 above.

## THE FINAL TOLL

What, then, was the overall death toll from the 1918–1919 flu pandemic?

The worldwide toll is commonly given as 21 million (or sometimes 20 million to 25 million, or even 30 million), with the lowest of these figures “probably a gross underestimation” according to Crosby. He adds, “The best estimate of the number of Americans who died of flu and pneumonia from September 1918 to June 1919 is 675,000.” This total presumably includes military deaths from flu. Authorities stated that the U.S. forces worldwide lost 50,301 persons to disease during the war, 80 percent of them to the flu.<sup>47</sup> The above worldwide

Table 5. Epidemic Mortality, 1804–1937

Year	Disease	Deaths <sup>1</sup>
1804	“okuu” (cholera?)	<15,000
1818	“catarrhs and fevers”	60
1825	unnamed	“Great”
1826	influenza	“Thousands”
1839	mumps	“Great numbers”
1848–1849	measles, whooping cough, influenza	10,000
1853	smallpox	5,000–6,000
1857	influenza, dengue	“Many”
1870–1871	scarlet fever	“Great”
1878–1880	whooping cough	68
1881	smallpox	282
1888	whooping cough	104
1889–1890	measles, dysentery	26
1895	cholera	64
1899–1900	bubonic plague	61
1918–1920	influenza	2,338
1928–1929	cerebrospinal meningitis	68
1936–1937 <sup>2</sup>	measles	205

<sup>1</sup> Excludes deaths primarily resulting from famine; for data, see Robert C. Schmitt, “Famine Mortality in Hawaii,” *The Journal of Pacific History* 5 (1970): 109–15.

<sup>2</sup> Most recent of record as of May 1998.

Source: Robert C. Schmitt, “The *Okuu*—Hawaii’s Greatest Epidemic,” *Hawaii Medical Journal* 29.5 (May–June 1970): 359–64; present study.

and U.S. figures exclude the toll from the 1920 epidemic, included in the present Island data.

In Hawai'i, more than 2,338 persons died from influenza, bronchopneumonia, or lobar or unspecified pneumonia between July 1, 1918 and June 30, 1920 (see table 2). This total is however incomplete, since it omits mortality among military personnel for the war years. The data do however include deaths from pneumonia, omitted from some earlier estimates.

Whatever its limitations, this total clearly puts the influenza pandemic, and its 1920 sequel among the four most devastating Hawai'i epidemics of record. It is exceeded only by the 'oku'u of 1804 (with perhaps 15,000 deaths), a rapid succession of diseases in 1848-49 (measles, whooping cough, and influenza, killing about 10,000 in total), and smallpox (5,000 to 6,000 deaths) in 1853. The complete record of major epidemics—except for AIDS, still in progress at this writing—appears in table 5.

Crosby and some other writers have treated Hawai'i's role in the pandemic and epidemic of 1918-1920 as relatively minor and benign.<sup>48</sup> Certainly, in any comparison with the experiences of many Mainland communities, the French front lines, or Western Samoa, Hawai'i fared better. But the events of 1918-1920 did cause more than 2,300 deaths in the Islands, no small number. And they gave Hawai'i its fourth most fatal epidemic in the historical record. The experience deserves remembrance.

## NOTES

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<sup>1</sup> Alfred W. Crosby, *America's Forgotten Pandemic, The Influenza of 1918* (Cambridge: Cambridge U P, 1989) 311-28. The average length of life estimates are those published in the U.S. Department of Health and Human Services, National Center for Health Statistics, *United States Abridged Life Tables, 1996*, Vol. 47, No. 13, Dec. 24, 1998, p. 18. For evidence of a resurgence of interest

- in the flu pandemic (centered mostly on the recovery of flu victims' bodies from graves in Alaska and Norway), see Erik Larson, "The Flu Hunters," *Time*, February 23, 1998: 54-60, 63, 64.
- <sup>2</sup> Ralph S. Kuykendall, *Hawaii in the World War* (Honolulu: Historical Commission of the Territory of Hawaii, 1928); Gavan Daws, *Shoal of Time* (Honolulu: U P of Hawai'i, 1968); Helen Gay Pratt, *Hawaii, Off-Shore Territory* (New York: Charles Scribner's Sons, 1944).
  - <sup>3</sup> C. B. Wood, M.D., "A Brief History of Medicine in Hawaii," *Transactions of the First Annual Meeting of the Hawaii Territorial Medical Association . . . 1926*.
  - <sup>4</sup> HAA 1920: 144; HAA 1921: 123; *Report of Governor of Hawaii to the Secretary at the Interior* for fiscal years 1919 (pp. 66, 68) and 1920 (pp. 70, 72, 74); *Report of the President of the Board of Health* for twelve-month periods ended June 30, 1919 (pp. 3, 7, 13) and 1920 (pp. 3-4, 8, 14-15, 17); U.S. Bureau of the Census, *Mortality Statistics* for 1918 (p. 574), 1919 (p. 592), and 1920 (p. 648).
  - <sup>5</sup> Ralph S. Kuykendall and A. Grove Day, *Hawaii: A History* (New York: Prentice-Hall, 1948) 281.
  - <sup>6</sup> Harvey B. Simon, M.D., "Influenza and Other Respiratory Viral Infections of Adults," *Scientific American Medicine* (1994): 1.
  - <sup>7</sup> "Dr. Eaton's Report on the Influenza Epidemic," *Plantation Health* (Jan. 1, 1941): 15.
  - <sup>8</sup> Simon, "Influenza" 3.
  - <sup>9</sup> Simon, "Influenza" 3.
  - <sup>10</sup> Alfred W. Crosby, Jr., "The Influenza Pandemic of 1918," in *History, Science, and Politics: Influenza in America 1918-1976*, ed. June E. Osborn (New York: Prodist, 1977) 6-7.
  - <sup>11</sup> Crosby, "The Influenza Pandemic of 1918" 8, 12.
  - <sup>12</sup> Crosby, "The Influenza Pandemic of 1918" 12.
  - <sup>13</sup> *HSB* July 1, 1918: 1; *PCA*, July 3, 1918: 4. See also *PCA*, July 2, 1918: 4.
  - <sup>14</sup> *HSB* July 3, 1918: 12.
  - <sup>15</sup> W. T. Dunn, "Flu Epidemic of 1917" [*sic*], *Plantation Health* (April 1, 1956): 5-7.
  - <sup>16</sup> Crosby, *America's Forgotten Pandemic* 230.
  - <sup>17</sup> *Report of the President of the Board of Health of the Territory of Hawaii for the Twelve Months Ended June 30, 1919* 3.
  - <sup>18</sup> *HSB* Dec. 31, 1919: 4.
  - <sup>19</sup> *Report of the President of the Board of Health . . . 1919* 3; *HSB* Feb. 13, 1919: 1; *HSB* Mar. 1, 1919: 4; *HSB* Jan. 27, 1920: 1-2.
  - <sup>20</sup> *HSB* Feb. 24, 1919: 5; *HSB* Feb. 2, 1920: 1; *HSB* Feb. 6, 1920: 1-2; *HSB* Feb. 12, 1920: 1; *Report of the President of the Board of Health . . . 1920* 3-4, 17.
  - <sup>21</sup> *HSB* Oct. 25, 1918: 1; *HSB* Nov. 4, 1918: 3.
  - <sup>22</sup> *HSB* Oct. 23, 1918: 1; *HSB* Feb. 5, 1919: 1; *HSB* Feb. 14, 1919: 1, 6.
  - <sup>23</sup> HAA 1920: 144.
  - <sup>24</sup> *HSB* Feb. 10, 1919: 2; *HSB* Feb. 2, 1920: 1-2; *HSB* Feb. 14, 1920: 1; *PCA*, Mar. 15, 1920: 6.



- <sup>25</sup> *HSB* Feb. 15, 1919: 1.
- <sup>26</sup> *Report of the President of the Board of Health . . . 1919* 3.
- <sup>27</sup> Hawaii State Dept. of Health, Research and Statistics Office, *Communicable Diseases in Hawaii* (R & S Report. No. 11, June 1976), table 1.
- <sup>28</sup> U.S. Bureau of the Census, *Mortality Statistics 1921* 10.
- <sup>29</sup> Robert C. Schmitt, *Demographic Statistics of Hawaii: 1778-1965* (Honolulu: U Hawaii P, 1968) 163, 168.
- <sup>30</sup> U.S. Bureau of the Census, *Mortality Statistics 1918* 27.
- <sup>31</sup> *HSB* Feb. 6, 1920: 1-2.
- <sup>32</sup> *HSB* Nov. 1, 1918: 4.
- <sup>33</sup> *HSB* Feb. 25, 1920: 2.
- <sup>34</sup> *HSB* Oct. 23, 1918: 1. See also *HSB* Jan. 27, 1920: 1-2.
- <sup>35</sup> *HSB* Oct. 24, 1918: 2.
- <sup>36</sup> *HSB* Nov. 11, 1918: 3.
- <sup>37</sup> *HSB* Feb. 9, 1920: 3.
- <sup>38</sup> *HSB* Feb. 6, 1919: 3.
- <sup>39</sup> *HSB* Feb. 16, 1920: 7; *HSB* Feb. 23, 1920: 1.
- <sup>40</sup> Ronald Takaki, *Pau Hana* (Honolulu: U Hawai'i P, 1983) 164-77.
- <sup>41</sup> Kuykendall and Day, *Hawaii: A History* 281.
- <sup>42</sup> *HSB* Feb. 16, 1920: 1; *HSB* Feb. 17, 1920: 1.
- <sup>43</sup> *HSB* Mar. 10, 1920: 1.
- <sup>44</sup> *HSB* Feb. 19, 1919: 6.
- <sup>45</sup> John Mortimer Lydgate. "Flu' Inspecting on the Garden Isle," *PP* May 1919: 28-30.
- <sup>46</sup> U.S. Bureau of the Census, *Mortality Statistics 1918* 574; *Mortality Statistics 1919* 592; *Mortality Statistics 1920* 648.
- <sup>47</sup> Crosby, *America's Forgotten Pandemic* 206, 207; *HSB* Feb. 19, 1919: 6.
- <sup>48</sup> Crosby, *America's Forgotten Pandemic* 230; Crosby, "The Influenza Pandemic of 1918" 8; Laurie Garrett, *The Coming Plague* (New York: Farrar, Straus and Giroux, 1994) 157.

