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## Updating the Accounts: Global Mortality of the 1918–1920 “Spanish” Influenza Pandemic

NIALL P. A. S. JOHNSON AND JUERGEN MUELLER

**SUMMARY:** The influenza pandemic of 1918–20 is recognized as having generally taken place in three waves, starting in the northern spring and summer of 1918. This pattern of three waves, however, was not universal: in some locations influenza seems to have persisted into or returned in 1920. The recorded statistics of influenza morbidity and mortality are likely to be a significant understatement. Limitations of these data can include nonregistration, missing records, misdiagnosis, and nonmedical certification, and may also vary greatly between locations. Further research has seen the consistent upward revision of the estimated global mortality of the pandemic, which a 1920s calculation put in the vicinity of 21.5 million. A 1991 paper revised the mortality as being in the range 24.7–39.3 million. This paper suggests that it was of the order of 50 million. However, it must be acknowledged that even this vast figure may be substantially lower than the real toll, perhaps as much as 100 percent understated.

**KEYWORDS:** influenza, pandemic, mortality, 1918

The epidemiology, morbidity, and mortality of the most deadly influenza pandemic in history have been described at the local, regional, and national level in many studies. Few authors have attempted to present the global situation, and the last major effort was made in 1991.<sup>1</sup> An international conference on the history, virology, demography, and geography of the pandemic was held at the University of Cape Town in September

We would like to acknowledge all our colleagues whose work on the pandemic, along with our own, made this paper possible. We would also like to thank the three anonymous reviewers for their useful feedback.

1. K. David Patterson and Gerald F. Pyle, “The Geography and Mortality of the 1918 Influenza Pandemic,” *Bull. Hist. Med.*, 1991, 65: 4–21.

1998;<sup>2</sup> the new approaches and new regional studies presented there, in addition to some comparative studies, have helped redress our patchy knowledge. This paper does not attempt to summarize the entire conference; rather, its purpose is limited to updating the tally of mortality caused by this single massive pandemic.<sup>3</sup>

One of the most striking aspects of the influenza pandemic of 1918–1920 was the heavy toll on the young adult population. Some regions reported mortality rates for the entire population as high as 5–10 percent.<sup>4</sup> On the other hand, there are areas where very low morbidity and mortality were reported.<sup>5</sup> Svenn-Erik Mamelund has suggested that coastal locations, urban centers, and areas with higher levels of connection via communication and transport networks endured higher mortality rates than remote, rural, and isolated areas.<sup>6</sup> It has been suggested that a fresh look at the epidemiology may help to explain examples of regional mortality variations. This, however, is outside the scope of this paper. Indeed, it could be argued that such local variations are rendered trivial

2. "The Spanish 'Flu 1918–1998: Reflections on the Influenza Pandemic of 1918 after 80 Years," meeting held at University of Cape Town, 12–15 September 1998.

3. A collection of the papers from the Cape Town conference is due to be published as Howard Phillips and David Killingray, eds., *The Spanish Flu Pandemic of 1918–19: New Perspectives* (London: Routledge, 2002).

4. See, for example, Colin Brown, "The Influenza Pandemic of 1918 in Indonesia," in *Death and Disease in Southeast Asia: Explorations in Social, Medical and Demographic History*, ed. Norman G. Owen (Oxford: Oxford University Press, 1987), pp. 235–56; Beatriz Echeverri Dávila, *La gripe española: La pandemia de 1918–1919* (Madrid: Centro de Investigaciones Sociológicas, 1993); Ian D. Mills, "The 1918–1919 Influenza Pandemic—The Indian Experience," *Indian Econ. & Soc. Hist. Rev.*, 1986, 23: 1–40; Juergen Mueller, "Patterns of Reaction to a Demographic Crisis: The Spanish Influenza Pandemic (1918–1919) in Sub-Saharan Africa. A Research Proposal and Preliminary Regional and Comparative Findings," Staff Seminar Paper no. 6 (Nairobi: University of Nairobi, Department of History, 1995); Karl David Patterson, "The Influenza Epidemic of 1918–19 in the Gold Coast," *J. Afr. Hist.*, 1983, 24: 485–502; Howard Phillips, "Black October": *The Impact of the Spanish Influenza Epidemic of 1918 on South Africa*, Archives Year Book for South African History (Pretoria: Government Printer, 1990); Geoffrey W. Rice (with assistance from Linda Bryder), *Black November: The 1918 Influenza Pandemic in New Zealand* (Wellington: Allen & Unwin, 1988); Sandra M. Tomkins, "The Influenza Epidemic of 1918–19 in Western Samoa," *J. Pacific Hist.*, 1992, 27: 181–97; idem, "Colonial Administration in British Africa during the Influenza Epidemic of 1918–19," *Can. J. Afr. Stud.*, 1994, 28: 60–83.

5. See, for example, Mueller, "Patterns of Reaction" (n. 4); Phillips, "Black October" (n. 4).

6. Svenn-Erik Mamelund, "Spanskeskyen i Norge 1918–1920: Diffusjon og demografiske konsekvenser" (master's degree thesis, University of Oslo, 1998). Phillips reached similar conclusions in explaining the variations in South Africa, especially for Natal: Phillips, "Black October" (n. 4).

by the sheer scale and generalized nature of the pandemic, as evidenced by the universal pattern of young adult mortality. The pattern of age mortality can be considered one of the most important and identifying characteristics of this pandemic.

The pandemic is recognized as having generally taken place in three waves, starting in the northern spring and summer of 1918. This comparatively mild first wave attracted relatively little attention. The second wave scorched its way around the globe in the northern autumn and was followed by another, less-severe wave early in 1919. The three waves circumnavigated the globe in a little less than a year. However, this pattern of three waves was not universal: Australia, for example, due to the partial success of a maritime quarantine that delayed the outbreak until early in 1919, experienced a single, longer wave of influenza activity.

In some locations influenza seems to have persisted into or returned in 1920—for example, across Scandinavia, and in isolated South Atlantic islands. Some regard this as a “fourth wave” of the pandemic. This is not a consistent feature, however, and it is debatable whether it should be considered a fourth wave of the pandemic or a new epidemic, possibly associated with a different strain of the virus.

## Underreporting

One of the most difficult problems for those working on past outbreaks of disease is that of data: what data there are tend to be inconsistent and of questionable validity, accuracy, and robustness. This has long been a concern with medical or vital statistics. Graham Mooney quoted from the *49th Annual Report of the Registrar-General* that “it is useless . . . to shut our eyes to the imperfections of our records. To be without trustworthy means of comparison is doubtlessly an evil, but to ignore the difficulties and deal with the records as thoroughly reliable would be still worse, for it is far better to be without statistics at all than to be misled by false ones.”<sup>7</sup> Notwithstanding such pessimism, is it not better to use what data we have, while recognizing their limitations? In the present study, we have tended to the approach that Andrew D. Cliff, Peter Haggett, and John K. Ord described in the preface to their examination of the spatial aspects of influenza by declaring that “our philosophy has been pragmatic in the sense that to ignore these data, whatever their limitations,

7. *49th Annual Report of the Registrar-General*, 1888, p. xx; cited in Graham Mooney, “Professionalization in Public Health and the Measurement of Sanitary Progress in Nineteenth-Century England and Wales,” *Soc. Hist. Med.*, 1997, 10: 53.

would be to overlook major potential sources of information about the disease; in other words, we see our business as one of lighting candles rather than cursing the darkness.”<sup>8</sup>

Recognizing the limitations, it is generally accepted that recorded statistics of influenza morbidity and mortality are likely to be a significant understatement. These limitations can include nonregistration, missing records, misdiagnosis, and nonmedical certification, and they may also vary greatly between locations. Underreporting could also occur because of the deadlines placed on reporting by (colonial) authorities and reporting agencies, and the inconsistent coverage or reporting of the population (often overlooking rural and/or native populations). These factors are all in addition to the widespread problem of the restriction of reporting to the major wave of the pandemic, ignoring influenza mortality before and after this wave.

A recurring feature of the work on the pandemic in the last couple of decades has been the consistent upward revision of mortality figures. Much of the research has incorporated “excess” deaths calculations that have attempted to reveal the true extent of the mortality associated with the pandemic.

## Global Influenza Mortality

Global mortality was computed by Edwin Oakes Jordan in the 1920s to have been in the vicinity of 21.5 million.<sup>9</sup> Jordan’s estimate stood for decades, but now it seems almost ludicrously low, particularly since Ian Mills has put Indian mortality alone at 18 million.<sup>10</sup> K. David Patterson and Gerald Pyle’s more recent tally estimated the mortality as 24.7–39.3 million, while suggesting that “a conservative total of roughly 30 million victims” was their preferred figure.<sup>11</sup> It is now a decade since Patterson and Pyle published their widely cited tabulation of global influenza deaths from the pandemic. In the light of the activities of many scholars,

8. Andrew D. Cliff, Peter Hagggett, and John K. Ord, *Spatial Aspects of Influenza Epidemics* (London: Pion, 1986), preface (unnumbered).

9. Edwin Oakes Jordan, *Epidemic Influenza: A Survey* (Chicago: American Medical Association, 1927). Wesley Spink gave a figure of 21,642,283, which suggests an implausible degree of precision. Spink’s tally recorded deaths in England and Wales as being only 112,239, whereas sixty years previously the Registrar-General had estimated mortality at 200,000; Wesley W. Spink, *Infectious Disease: Prevention and Treatment in the Nineteenth and Twentieth Centuries* (Folkestone: Dawson, 1979), pp. 215–16.

10. Mills, “Indian Experience” (n. 4).

11. Patterson and Pyle, “Geography and Mortality” (n. 1), p. 15.

culminating in the first international conference on the pandemic, it is appropriate and timely that we should revisit their figures and provide an updated account, as given in Tables 1–5.<sup>12</sup> This not only reflects our greater knowledge of the pandemic due to the efforts of many workers, but can also be considered a memorial to the late David Patterson who did so much to bring it into the realm of modern academic interest.

These tables are by no means a definitive record of the mortality brought about by the pandemic. It must be accepted that much of the mortality may not have been recorded, and what figures do exist vary greatly in coverage and reliability. In almost every instance where a researcher has reexamined the pandemic with a view to determining the true level of mortality, this has led to a significant upward revision.

There are many problems with these figures, many reasons why the estimates are shown as quite large ranges. There are a number of issues concerning the data that one has to keep in mind when trying to make such an enumeration. Ideally, we would have figures for entire nations, for the entire pandemic period (all waves), and for all deaths caused by the pandemic (influenza + pneumonia + all other “excess” deaths). Unfortunately, this is not the case with the vast majority of the data: some cover only certain populations or certain areas in a country, some cover only the second wave, some include only “influenza” deaths. However, our tables do, we believe, give a more accurate tally of the mortality due to the pandemic and reflect the research that has been undertaken since Patterson and Pyle published their tabulation.

The figures used here have been derived in various ways by many researchers. The methods employed include revisiting official records and recompiling the recorded numbers, and calculating “excess” deaths from recorded mortality for influenza, respiratory causes, or all causes. For example, the British figures presented (for Scotland, England, and Wales) were calculated using an excess-deaths method focused on five

12. The following sources were used in constructing the tables: Margareta Åman, “Spanska sjukan: Den svenska epidemin 1918–1920 och dess internationella bakgrund [Spanish influenza: The Swedish epidemic, 1918–1920, and its international background]” (Ph.D. thesis, Uppsala University, 1990); Andrew D. Cliff, Peter Hagggett, and John K. Ord, *Spatial Aspects of Influenza Epidemics* (London: Pion, 1986), preface (unnumbered); Richard Hugheson Collier, *The Plague of the Spanish Lady: The Influenza Pandemic of 1918–1919* (London: Macmillan, 1974); Edwin Oakes Jordan, *Epidemic Influenza: A Survey* (Chicago: American Medical Association, 1927); Ministry of Health, *Report on the Pandemic of Influenza 1918–1919* (London: Ministry of Health/HMSO, 1920); and K. David Patterson and Gerald F. Pyle, “The Geography and Mortality of the 1918 Influenza Pandemic,” *Bull. Hist. Med.*, 1991, 65: 4–21.

Table 1. Mortality of the 1918–1920 Influenza Pandemic: Africa

Location	Population	Published death toll (per 1,000)	Published death rate (per 1,000)	Recalculated death rate
Belgian Congo		~300,000	~50.00	
Botswana		7,000	40.00– 50.00	
Cameroon	561,000 <sup>a</sup>	250,000		445.0
Chad			21.40	
Egypt	12,936,000	138,600		10.7
Gambia	211,000 <sup>a</sup>	>7,800	~50.00	37.0
Ghana (Gold Coast)	2,298,000	88,500– 100,000	~40.00	43.5
Kenya	2,596,000	150,000	40.00	57.8
Madagascar	3,388,000		35.00	
Mauritius	377,000	>12,000		31.8
Nigeria	18,631,000 <sup>a</sup>	~455,000	30.00	24.4
Senegal		37,500	30.00	
Sierra Leone	1,541,000 <sup>a</sup>		30.00	
Somalia			25.60	
South Africa	6,769,000	~300,000	43.97	44.3
Southern Rhodesia	873,000		27.30	
North Africa		200,000– 248,000	7.50– 10.00	
All sub-Saharan Africa		~2,175,000	~23.10	
TOTAL		~2,375,000	~18.20	

Sources: Festus Cole, "Sierra Leone and World War I," Ph.D. thesis, University of London, 1994; Myron Echenberg, "L'histoire et l'oubli collectif: L'épidémie de grippe de 1918 au Sénégal," in *Population, reproduction, sociétés: Perspectives et enjeux de démographie sociale: Mélanges en l'honneur de Joel W. Gregory*, ed. Dennis D. Cordell (Montreal: Presses de l'Université de Montréal, 1993); G. W. Hartwig and K. D. Patterson, eds., *Disease in African History: An Introductory Survey and Case Studies* (Durham, N.C.: Duke University Press, 1978); Gustave Martin, "Cameroun: L'épidémie d'influenza de 1918–1919," *Annales de Médecine et de Pharmacie Coloniale*, 1921, 19: 444–48; B. R. Mitchell, *International Historical Statistics Africa, Asia and Oceania 1750–1988*, 2d rev. ed. (New York: Stockton, 1995); Juergen Mueller, "Patterns of Reaction to a Demographic Crisis: The Spanish Influenza Pandemic (1918–1919) in Sub-Saharan Africa. A Research Proposal and Preliminary Regional and Comparative Findings," Staff Seminar Paper no. 6 (Nairobi: University of Nairobi, Department of History, 1995); D. C. Ohadike, "The Influenza Pandemic of 1918–19 and the Spread of Cassava Cultivation on the Lower Niger: A Study of Historical Linkages," *J. Afr. Hist.*, 1981, 22: 379–91; Karl David Patterson, "The Influenza Epidemic of 1918–19 in the Gold Coast," *J. Afr. Hist.*, 1983, 24: 485–502; Howard Phillips, "South Africa's Worst Demographic Disaster: The Spanish Influenza Epidemic of 1918," *South Afr. Hist. J.*, 1988, 20: 57–73; idem, "Black October": *The Impact of the Spanish Influenza Epidemic of 1918 on South Africa*, Archives Year Book for South African History (Pretoria: Government Printer, 1990); Ian R. Phimister, "The 'Spanish' Influenza Pandemic of 1918 and Its Impact on the Southern Rhodesian Mining Industry," *Centr. Afr. J. Med.*, 1973, 19: 143–48.

<sup>a</sup>In 1921.



Table 2. Mortality of the 1918–1920 Influenza Pandemic: The Americas

Location	Population	Published death toll (per 1,000)	Published death rate (per 1,000)	Recalculated death rate
Argentina	8,517,000	10,200	1.20	1.2
Brazil	26,277,000	180,000	6.00	6.8
British Caribbean		~30,000		
Canada	8,148,000	~50,000	6.25	6.1
Caribbean		~100,000		
Chile		35,000	11.00	
Guatemala	1,241,000	48,600		39.2
Mexico	14,556,000	300,000	23.00	20.6
Uruguay	1,439,000	2,050	1.40	1.4
USA	103,208,000	675,000		6.5
Other South America		~100,000		
Total Latin America		766,000– 966,000	8.4– 10.6	
Total North America		725,000		
TOTAL		~1,540,000		

Sources: Alfred W. Crosby, *America's Forgotten Pandemic: The Influenza of 1918* (Cambridge: Cambridge University Press, 1989); David Killingray, “The Influenza Pandemic of 1918–1919 in the British Caribbean,” *Soc. Hist. Med.*, 1994, 7: 60–87; David McCreery, “Guatemala City,” in *1918–1919 Pandemic of Influenza: The Urban Impact in the Western World*, ed. F. R. van Hartesveldt (London: Edwin Mellen Press, 1992), pp. 161–83; Janice P. Dickin McGinnis, “The Impact of Epidemic Influenza: Canada 1918–1919,” *Hist. Pap.*, 1977, pp. 120–40; B. R. Mitchell, *International Historical Statistics The Americas 1750–1993*, 4th ed. (New York: Stockton, 1998).

causes of death (influenza, pneumonia, bronchitis, phthisis, and what was termed “organic heart disease” by the Registrar-General) for the pandemic period (June 1918 to May 1919). Another method is to use the data available for a certain population within a country, determine the mortality rate for that population, and then use that to calculate total mortality for the entire population. The methods available to individual researchers are often determined by the data available. (For details on how specific figures were arrived at, refer to the sources specified.)

These variations in method and time and population coverage can give rise to a range of estimates of mortality. Our tables indicate the ranges given for many countries; they show how uncertain these estimates may be, owing to the lack of definitive data on populations, mortality, and mortality rates, and the variability within the extant data for many locations. The tables represent the compilation of our knowledge of the pandemic, and it is acknowledged that there are areas where



Table 3. Mortality of the 1918–1920 Influenza Pandemic: Asia

Location	Population	Published death toll (per 1,000)	Published death rate (per 1,000)	Recalculated death rate
Afghanistan		~320,000		
Ceylon (Sri Lanka)	5,109,000	91,600		17.9
China	472,000,000 <sup>a</sup>	4,000,000– 9,500,000		8.4–20.1
India	305,693,000 <sup>b</sup>	18,500,000		6.1
Indonesia	49,350,000	1,500,000		30.4
Japan	55,033,000	388,000	~6.70	7.0
Philippines	10,151,000	93,686	8.00	1.7
Taiwan	3,670,000	25,394		6.9
Southwest Asia		215,000– 430,000	5.00–10.00	
Other East and Southeast Asia		220,000– 1,300,000	5.00–30.60	
TOTAL		26,000,000– 36,000,000		

Sources: Colin Brown, "The Influenza Pandemic of 1918 in Indonesia," in *Death and Disease in Southeast Asia: Explorations in Social, Medical and Demographic History*, ed. Norman G. Owen (Oxford: Oxford University Press, 1987), pp. 235–56; Chi-Ho Chan and W. T. Liu, "The Evolution of Influenza A/H1N1 in Taiwan" (Paper presented at "The Spanish 'Flu 1918–1998: Reflections on the Influenza Pandemic of 1918 after 80 Years," Cape Town, 12–15 September 1998); Wataru Iijima, "The Spanish Influenza in China, 1918–1920" (Paper presented at "The Spanish 'Flu 1918–1998: Reflections on the Influenza Pandemic of 1918 after 80 Years," Cape Town, 12–15 September 1998); Ian D. Mills, "The 1918–1919 Influenza Pandemic—The Indian Experience," *Indian Econ. & Soc. Hist. Rev.*, 1986, 23: 1–40; B. R. Mitchell, *International Historical Statistics Africa, Asia and Oceania 1750–1988*, 2d rev. ed. (New York: Stockton, 1995); E. Palmer and G. W. Rice, "A Japanese Physician's Response to Pandemic Influenza: Ijiro Gomibuchi and the 'Spanish Flu' in Yaita-Cho, 1918–1919," *Bull. Hist. Med.*, 1992, 66: 560–77.

<sup>a</sup>In 1920.

<sup>b</sup>In 1921.

our collective knowledge is still quite poor. For example, the values given in Table 3 for China (4 to 9.5 million) reflect divergence in the accounts. A recent paper attempted to argue that China was largely spared the pandemic, based on an apparent lack of evidence.<sup>13</sup> However, the ab-

13. Wataru Iijima, "The Spanish Influenza in China, 1918–1920," paper presented at "The Spanish 'Flu 1918–1998: Reflections on the Influenza Pandemic of 1918 after 80 Years," Cape Town, 12–15 September 1998.

Table 4. Mortality of the 1918–1920 Influenza Pandemic: Europe

Location	Population	Published death toll (per 1,000)	Published death rate (per 1,000)	Recalculated death rate
Austria	6,131,445 <sup>a</sup>	20,458	3.00	3.3
Croatia		109,000		
Denmark	3,010,000	12,374	3.50	4.1
Eire	4,280,000	18,367	4.04	4.3
England & Wales	34,020,000	~200,000	~4.90	5.8
Finland	3,120,000	18,000	5.80	5.8
France	32,830,000	240,000	3.90	7.3
Germany	58,450,345 <sup>a</sup>	225,330	3.70	3.8
Prussia		236,662	4.50	
Hungary	7,880,000	~100,000		12.7
Iceland		484	5.40	
Italy	36,280,000	390,000	11.00	10.7
Malta		588		
Netherlands	6,750,000	48,042		7.1
Norway	2,580,000	14,676	5.70	5.7
Portugal	6,010,000	59,000	9.70	9.8
Russia/USSR	184,000,000 <sup>b</sup>	~450,000	5.00	2.4
Scotland	4,850,000	27,650– 33,771	6.80–8.30	5.7–6.9
Spain	20,880,000	257,082	12.00	12.3
Sweden	5,810,000	34,374	5.41	5.9
Switzerland	3,880,000	23,277	6.00	6.1
TOTAL		~2,300,646	~4.80	

Sources: Margareta Åman, “Spanska sjukan: Den svenska epidemin 1918–1920 och dess internationella bakgrund [Spanish influenza: The Swedish epidemic, 1918–1920, and its international background]” (Ph.D. thesis, Uppsala University, 1990); Giovanni Cavina, *L’influenza epidemica attraverso i secoli* (Rome: Edizioni Pozzi, 1959); *Census of England and Wales*, 1921, p. 17; Beatriz Echeverri, “Spanish Influenza Seen from Spain” (Paper presented at “The Spanish ‘Flu 1918–1998: Reflections on the Influenza Pandemic of 1918 after 80 Years,” Cape Town, 12–15 September 1998); Cathcart Garner, “Annual Report for the Year 1918 (Colonial Medical Report No. 126, Egypt),” *J. Trop. Med. & Hygiene*, 1921, 24 (suppl.): 75–88; Niall Philip Alan Sean Johnson, “Aspects of the Historical Geography of the 1918–19 Influenza Pandemic in Britain” (Ph.D. thesis, University of Cambridge, 2001); Eila Linnanmäki, “Spanish Flu in Finnish Cities, 1918–1920” (Paper presented at “The Spanish ‘Flu 1918–1998: Reflections on the Influenza Pandemic of 1918 after 80 Years,” Cape Town, 12–15 September 1998); Eila Linnanmäki, “Re: A table of global flu mortality” (e-mail to Niall Johnson, 4 March 1999); Svann-Erik Mamelund, “Estimating the Death Toll of Spanish Influenza 1918–19: The Case of Norway” (Paper presented at “The Spanish ‘Flu 1918–1998: Reflections on the Influenza Pandemic of 1918 after 80 Years,” Cape Town, 12–15 September 1998); Ministry of Health, *Report on the Pandemic of Influenza 1918–1919* (London: Ministry of Health/HMSO, 1920); B. R. Mitchell, *International Historical Statistics*

Table 4 continued on next page

Table 4, notes, continued

*Europe 1750–1988*, 3d ed. (New York: Stockton, 1992); Jürgen Müller, “Die spanische Influenza 1918/19: Der Einfluß des Ersten Weltkrieges auf Ausbreitung, Krankheitsverlauf und Perzeption einer Pandemie [The influence of the First World War on the spread, course of disease, and perception of a pandemic],” in *Die Medizin und der Erste Weltkrieg*, ed. Wolfgang U. Eckart and Christoph Gradmann (Pfaffenweiler: Centaurus-Verlagsgesellschaft, 1996), pp. 321–42.

<sup>a</sup>Postwar.

<sup>b</sup>In 1917.

Table 5. Mortality of the 1918–1920 Influenza Pandemic: Oceania, and Global Total

Location	Population	Published death toll (per 1,000)	Published death rate (per 1,000)	Recalculated death rate
Australia	5,304,000 <sup>a</sup>	14,528	2.8	2.7
Fiji	164,000	9,000	52.0	54.9
Guam		858		
Nauru			160.0	
New Zealand	1,158,000		<20.0	
Pakeha (non-Maori)		6,413	5.8	
Maori		2,160	42.4	
Pacific Islands			>50.0	
Tonga	23,000 <sup>b</sup>		42.0–84.0	
Western Samoa	36,000 <sup>b</sup>	8,500	220.0	236.1
TOTAL		~85,000		
GLOBAL TOTAL		>48,798,038		
		~50,000,000–	~2.5–5.0	
		100,000,000		

Sources: Phyllis S. Herda, “Disease and Colonialism in the Pacific: The 1918 Influenza Pandemic in Western Polynesia” (Paper presented at “The Spanish ‘Flu 1918–1998: Reflections on the Influenza Pandemic of 1918 after 80 Years,” Cape Town, 12–15 September 1998); B. R. Mitchell, *International Historical Statistics Africa, Asia and Oceania 1750–1988*, 2d rev. ed. (New York: Stockton, 1995); Geoffrey W. Rice, “Australia and New Zealand in the 1918–19 Influenza Pandemic,” in *New Perspectives on the History of Medicine: First National Conference of the Australian Society of the History of Medicine*, ed. Harold Attwood, Richard Gillespie, and Milton J. Lewis (Melbourne: University of Melbourne, 1989), pp. 67–74; Geoffrey W. Rice (with assistance from Linda Bryder), *Black November: The 1918 Influenza Pandemic in New Zealand* (Wellington: Allen & Unwin, 1988); Sandra M. Tomkins, “The Influenza Epidemic of 1918–19 in Western Samoa,” *J. Pacific Hist.*, 1992, 27: 181–97.

<sup>a</sup>In 1919.

<sup>b</sup>In 1921.

sence of evidence is no evidence for the absence of illness, particularly given the timing and nature of the pandemic—a pandemic that has been noted for the way it has eluded the memory.<sup>14</sup> It is beyond the remit of this paper to examine in detail every competing claim for the mortality occasioned by the pandemic in each country; rather, this is an attempt to bring together the published figures, accepting the value of the peer review process that has seen these figures published while also recognizing the variation in the available data and the methodologies employed. As Patterson and Pyle remarked, “the precise total can never be known.”<sup>15</sup>

Global mortality from the influenza pandemic appears to have been of the order of 50 million. However, even this vast figure may be substantially lower than the real toll, perhaps as much as 100 percent understated. There are vast areas of the world for which we have no or little information, and often what information we do have is of dubious quality and contradictory. Sometimes the data cover only certain cities or populations; often the indigenous mortality has never been considered. Sometimes the figures given are only those that were recorded as influenza deaths; at other times, they are influenza and pneumonia deaths. Consequently, the real pandemic mortality may fall in the range of 50 to 100 million, but it would seem unlikely that a truly accurate figure can ever be calculated. The lack of precision notwithstanding, the scale of mortality undoubtedly makes it one of the largest outbreaks of disease in recorded history, particularly as these deaths occurred in a very short time, from early 1918 through to, in some cases, 1920.

14. A point most notably raised in Alfred W. Crosby, *America's Forgotten Pandemic: The Influenza of 1918* (Cambridge: Cambridge University Press, 1989).

15. Patterson and Pyle, “Geography and Mortality” (n. 1), p. 13. In producing this updated tally of influenza mortality we have also contacted the global community of researchers into the 1918–19 pandemic, canvassing their opinions on the figures, particularly for their areas of expertise, in much the same way that AIDS mortality was/is derived—the so-called Delphi method: see Jonathan M. Mann and Daniel Tarantola, eds., *AIDS in the World II* (Oxford: Oxford University Press, 1996), p. 487.