

Spanish flu in Italy: new data, new questions

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SUMMARY

This paper proposes a new estimate for the number of victims of Spanish flu in Italy and highlights some aspects of mortality closely linked to the First World War. The sources used are official death statistics and the *Albo d'oro*, a roll of honour of the Italians fallen in the First World War. The new estimate of deaths from the flu is 410,000 for 1918, which should be raised to 466,000 when the numbers are taken up to 1920. Deaths from Spanish flu among the military were about 70,000. The time sequence

of deaths recognizes two distinct peaks, one in October and one in November 1918. Between these two peaks, the lowest number of deaths falls in the week of the armistice between Italy and Austria-Hungary (signed 4 November 1918). This suggests links between Spanish flu and WWI that cannot be merely explained in terms of movement of people and contagion.

Keywords: Spanish Flu, Italy, WWI.

INTRODUCTION

Italy was one of the European countries most severely affected by the Spanish flu [1]. Nevertheless, the influenza pandemic of 1918-19 in Italy has not been the subject of many studies. The first to address the topic was Giorgio Mortara in 1925 in a volume about Italian health in the Great War [2]. After Mortara's important work, we have to wait more than thirty years to see a new contribution on the subject, a volume by Giovanni Cavina which traces the history of the influenza epidemic in Italy. Only in recent years the question of the health of Italians during the war come back into the spotlight. Of course, here, the Spanish flu played a central role [3, 4].

The only monograph dedicated to the Spanish flu in Italy is a book by Eugenia Tognotti published in 2002 [5]. More recently, Sabbatani and Fiorino published an article which, while starting with

the global reach of the epidemic, in fact focuses on the flu in the city of Bologna [6]. Even more recent is a work by Alfani and Melegaro which places the Spanish flu in the more general context of pandemics as a whole [7]. Military historians, however, have tended to look at the influenza of 1918 in relation to war [8-10]. Some authors believe that the Spanish flu was a direct consequence of the war and that the conflict represented the real incubator of the virus [11]. Influenza, in fact, was born in military camps, where men and animals (livestock and pets) were in close proximity.

Most authors claim a close connection between the flu and the conflict, though the conflict was not necessarily the primary cause. The relationship between influenza and war should perhaps instead be sought in the rapidity of the virus' transmission and its global spread. These aspects would have been determined by the crowded conditions in the trenches and in hospitals and, of course, by the long-distance displacements of large masses of soldiers and workers [12-21]. Some scholars, however, either downplay the association of the war with the pandemic, or at least do not consider it to be obvious [22, 23]. According to Jay

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Winter, one of the most important demographers writing on the Great War, the link does not exist at all: "The pandemic was not connected to the war, its impact did not relate to consequences of the conflict, such as malnutrition, overcrowding or anxiety for the fate of their loved ones. It is possible that troops movements accelerated the spread of the infection, which however started out independent of war" [24].

It is not clear whether the Spanish flu originated in the United States, China or France. Consequently, we are not sure about the routes taken by the infection. But we know that it spread in several waves. The first, in the spring of 1918, appeared in a benign form; the second, in the autumn of the same year, was marked by very high levels of mortality; while the third, after the war, in the spring of 1919, killed a much smaller number of victims. Contrary to the influenza pandemics that preceded it and that would follow, where children and the elderly are usually struck down, the victims were typically adults, especially males, between the ages of 20 and 40 [25-29]. Here is a clear connection with the war and, in fact, those who fell sick and died were mostly soldiers participating in the conflict.

We intend to contribute here to studies on the Spanish flu with particular reference to military casualties. We have focused on the second wave, that struck Italy and caused by far the greatest number of victims. The aim is apparently limited. The study of the flu among soldiers allows us to re-interpret some more general aspects of the pandemic in the country as a whole. In particular, we intend to propose new estimates regarding the number of victims that the pandemic produced in the country. We also highlight some aspects of mortality closely related to military operations, which shed new light on its links with the conflict and its mode of diffusion.

To achieve these objectives, we have divided the paper into three parts. In the first we present our sources, in the second we provide a new estimate of the number of Spanish flu deaths in Italy, and in the third we propose a new reading of the timing and the logic of its spread.

Sources

Two principal sources are employed in this work. The first, already used by many scholars to draw some quantitative conclusions, consists of the

official death statistics broken down by cause of death. The data are published by the National Institute of Statistics (ISTAT) and are presented by age groups and by the month of occurrence. The second source, the most widely used here, is the *Albo d'oro*, a roll of honour of the Italian fallen in the war [30, 31]. As this source is rarely used, even by scholars of the Great War, we give below some background and a careful explanation of how we used it.

The *Albo d'oro* was released in the 1920s to commemorate all the soldiers who fell during the First World War. The 28 volumes that make up the entire work collect the names and some other information about the soldiers who died in war, including, crucially for present purposes, the age at death. There are 529,025 names.

The criteria for its compilation were set out by Fulvio Zugaro, head of the Army's Statistics Office and Chief scientific advisor of the operation [32]. The *Albo d'oro* was to include deaths in any war-related context: killed or missing in action; disappeared in war camps; death from illness, accidental causes, suicides, etc. Substantial resources were dedicated to the operation, using a multitude of channels that involved numerous central and peripheral public authorities, including the town council register offices (population registers and civil registers), the Statistics Office of the Supreme Command; the Historical Office of the Supreme Command; the Ministry of War; the Head Offices of Military Health; the Italian Red Cross, the *Uffici notizie* (News Offices), the Care and Honours Commission; and the General Pensions Office.

In this paper, given the sheer size of the *Albo d'oro*, we used a sample consisting of all the dead included in the pages of each of the 28 volumes of the work, singled out according to the sequence 1, 51, 101, 151 ... Every page contains 30 records. The total number of pages extracted are 367 (on average 61 pages for every year considered) or 11,010 individuals, which corresponds to roughly 2.1% of the total¹.

Part of the information extracted from the *Albo d'oro* is shown in Figure 1. The figure summarizes the monthly distribution of deaths by distinguishing victims of the fighting, deaths from disease (but

¹ The whole work is freely available online at <http://www.cadutigrandeguerra.it/>.

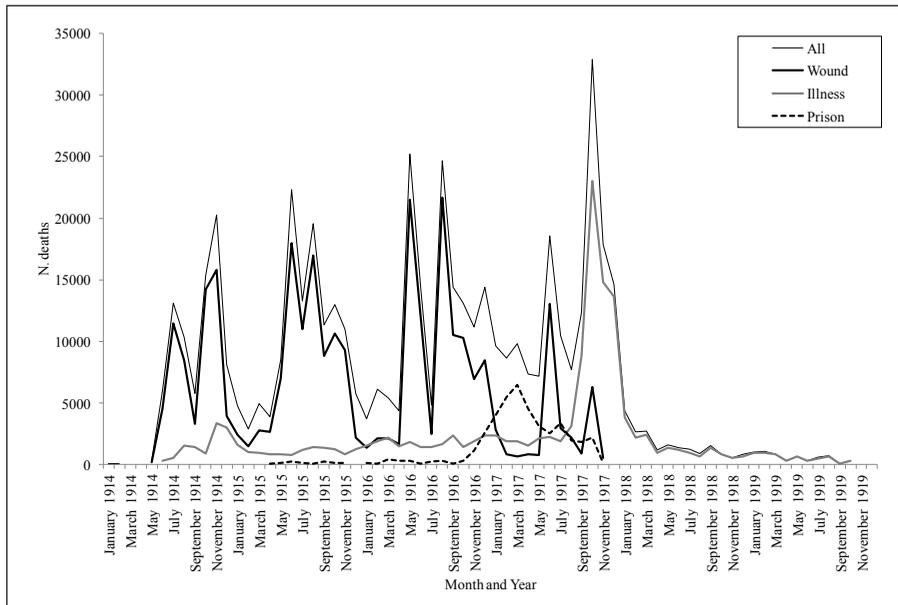


Figure 1 - Monthly distribution of the war dead. Total and selected causes and contexts (May 1915-October 1920). *Albo d'oro sample* [31].

not in enemy hands) and imprisonment (for all the causes).

The decision to divide the information into three categories, two related to the cause of death and one to the context of death, is in line, as we shall see, with the purpose of this work.

The monthly distribution of deaths from wounding highlights the historical rhythm of the conflict, punctuated by a series of peaks that correspond to the major battles. The number of deaths due to illness is relatively low until 1918. The increase in deaths just following the start of the war is dominated by some episodes of gastroenteritis and cholera which affected soldiers deployed on the Carso, on the eastern part of the Italian front, while the peak in the last months of the war was due almost entirely to the Spanish flu [33, 34]. This shows that the greatest number of battles in the conflict was fought not on the field, but in hospitals.

As the graph shows, the number of deaths in enemy prisons remained relatively low until October 1917, when there was a rapid increase that reached a peak in March 1918. After this month, the number of events fell as rapidly as they had risen, without returning to the levels at the start of the conflict, and another less dramatic peak occurred in October, one of the months when the Spanish flu was deadliest.

The major increase in deaths occurs just after the Battle of Caporetto (24 October 1917), which saw around 300,000 Italian prisoners arrive in enemy work camps. This can certainly be attributed to the long and harsh journey from the front to the detention centres and the terrible living conditions there. The *Albo d'oro* records the majority of deaths of these soldiers as due to illness, but most of the time these were attributable to food deprivation [35, 36]. Despite these terrible living conditions, scholars are in unanimous agreement that the wave of epidemics, above all the Spanish flu, which struck down Italian soldiers at the front, did not affect the prisoners in the war camps [2]².

Flu victims among the Italian armed forces and the statistics on Spanish influenza

The first estimate of the Spanish flu mortality rate in Italy were published by Giorgio Mortara [2]. The calculation method used by this scholar was based on the differential of deaths that occurred

²Considering those, too, who died in captivity, deaths among Italian soldiers from disease corresponds to 35.5% [34]. This is an unusual figure among the armies of the belligerent countries, at least among those in the West, the proportion of which was normally much lower: for example, 10% in the French army [38].

during the period of the spread of the Spanish flu with those that occurred in the same period of a year of “normal” mortality. In particular, Mortara stated that deaths from August 1918 to March 1919 exceeded the average figures for the same months of the years 1911-13 by some 532,457 units. These deaths, continued Mortara, should be added to the deaths of soldiers in prison camps, recorded by the military authorities, and those deaths of Italians in territories occupied by the enemy. The total, therefore, was brought up to about 600,000. Of course, the premise of this argument is that the official data, those that came from the civil registers, are incorrect. The author also pointed out that deaths due to other causes of death, such as pneumonia and bronchitis, simultaneously increased the spread of influenza and that, therefore, they should be included in the flu numbers. In reality, this calculation seems too high for two reasons that most scholars have generally ignored. Firstly, the Italian population, compared to the period 1911-13 had increased - in particular its female component - and, therefore, those exposed to the risk of dying from any cause were more numerous. Secondly, the years used as a comparison were years of peace, not of war.

In recent years, certainly, scholars have preferred smaller estimates. Patterson and Pyle, in an article published in 1991 suggested that 325,000 to 350,000 Italians died. The most recent works, however, have estimated 390,000 deaths [7, 39-41]. This figure is derived from the work of Giovanni Cavina [3] who, in turn, drew on a national estimate by Giuseppe Bellei, health officer of the city of Bologna in the period of the epidemic [42]. Bellei’s criteria for calculating national gross deaths are based on the approximately 2,000 deaths from influenza recorded in Bologna re-proportioned to the national level³.

Civil registers report that, in 1918, the number of overall deaths (males and females) from influenza were 274,000. All authors considered this figure too low. The problem is not just the number of deaths from influenza. As explained by Mortara,

in fact, the official figures did not include 560,000 deaths for which death certificates were drawn up by the military authorities, and which should be classified by each cause of death separately [2]. For this reason, The Max Planck Institute recently published, for the years 1915-18, the number of dead males with substantial additions, under the assumption that the official statistics for Italy and not only the military authority’s statistics are incomplete [44-45]. The total number of Italian soldiers who died in WWI, determined by Mortara and other authors, is approximately 650,000 [2, 46]⁴.

Thanks to the *Albo d’oro* we can count those soldiers who died from Spanish flu and who are not included in official statistics much more accurately. To do this, however, it is necessary to briefly explain the data collection process of the Population Registry Office during the years of the First World War, described by Mortara. Normally, the registration of deaths was (and still is) carried out by the municipalities on the basis of events related to present population. This information was then sent to the *Direzione generale della statistica* (General Direction of Statistics) who supervised the publication of the data. In the case of a person who died outside the municipality of residence, the municipality that recorded the event sent notice of the death to the municipality of residence.

During the conflict, however, the duty to record the deaths that occurred in the war zone was assigned to the armed forces. Thus, the deaths that occurred in the municipalities outside the war zone, even those that occurred in the territorial hospitals, continued to be transmitted to the *Direzione generale della statistica* by the civil registry offices of municipalities. All deaths in combat, in the field hospitals, and in the health care sections, had, meanwhile, to be sent by military personnel. The armed forces transmitted the information to municipalities of residence, but almost certainly not to the *Direzione generale della statistica*. Indeed, Mortara informs us that there did not exist then, as there is now, a full collection of these documents. This was, at the time conjectural. However, it is firmly supported by the data published in the official statistics which are consistent with this hypothesis.

³According to 1911 census data, this estimate is low [43]. The population of the town of Bologna was 172,628 inhabitants, while that of the Kingdom as a whole was 34,671,337. It follows that the 2,000 dead of Bologna correspond to 401,689 deaths throughout Italy. But we do not know what data Bellei used for his calculations.

⁴It should be noted that other more recent estimates diverge considerably from this [37, 47-48].

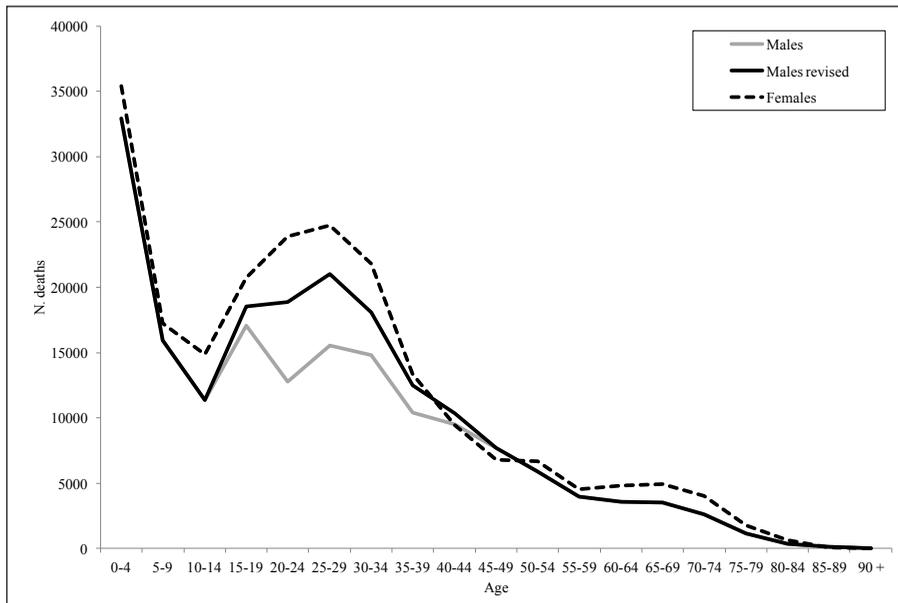


Figure 2 - Estimation of Spanish flu deaths in Italy (1918). Civil register data integrated with the *Albo d'oro* data.

Our estimate of deaths caused by the Spanish flu is obtained integrating the official information with the number of soldiers who died from disease in the war zone from 1 September to 31 December 1918. The estimate was made on the hypothesis that all the soldiers who died from diseases in these four months died from the flu. It is clear, though, that an indeterminable number of deaths resulted from other causes and that, therefore, the estimate is too high. On the other hand, we must consider that the *Albo d'oro* does not report all of the fallen. In fact, all soldiers found guilty of “dishonourable” behavior were excluded, while many others were omitted by mistake⁵. These gaps, then, should somewhat offset the overestimation derived from counts made by our criterion. According to our calculations, therefore, the military deaths from the disease from September to December 1918 were 70,000. Of these, the deaths outside the war zone were about 20,000.

As for 1918, the figures from official sources, which are based on civil registers, indicate 274,000 flu victims (males and females). To this data must be added the share of deaths due to pneumonia

and bronchitis which were more than in previous years, about 100,000 and 16,000 cases respectively, and finally, the 20,000 soldiers that we counted on the *Albo d'oro*. The results of this calculation gives us an estimate of about 410,000 deaths⁶.

But we must consider that in 1919 and 1920 flu deaths, though much less numerous than in 1918, were considerably higher than the pre-epidemic average, 32,000 and 24,000 units respectively [30]. Given this, we can conclude that the Spanish flu in Italy caused around 466,000 deaths.

Integrating official statistics with the information of the *Albo d'oro*, we can also redesign the age distribution of male deaths in 1918. The synthesis of this procedure is set out in Figure 2.

The final result seems more plausible than those derived from the official statistics, and more consistent with the age distribution of typical Spanish flu victims. We observe that the number of dead females, even with these additions, is greater than that of males. The figure, though it represents an exception in the wider context of studies on the Spanish flu, is consistent with the

⁵For a detailed estimation of these omissions, about 30,000, Fornasin [37]. The same figure is estimated in an independent form from Scòlè [47]. Unfortunately this author does not specify her reasons.

⁶A little higher but not far from the data of Bellei, but these considered deaths until 1919 [42]. In the data of this scholar, however, the soldiers of Bologna who died in the war area are not included in the numerator, while presumably they are included in the denominator.

statements of several authors: in Italy, influenza caused more victims among women than among men [2, 5, 49, 50].

This can be perceived, too, in those older than 50. Of course, the difference that we observe for 15-39 is also due to the fact that the males at risk of dying from influenza were significantly fewer than females, because many had already died in the war.

The Spanish flu among soldiers

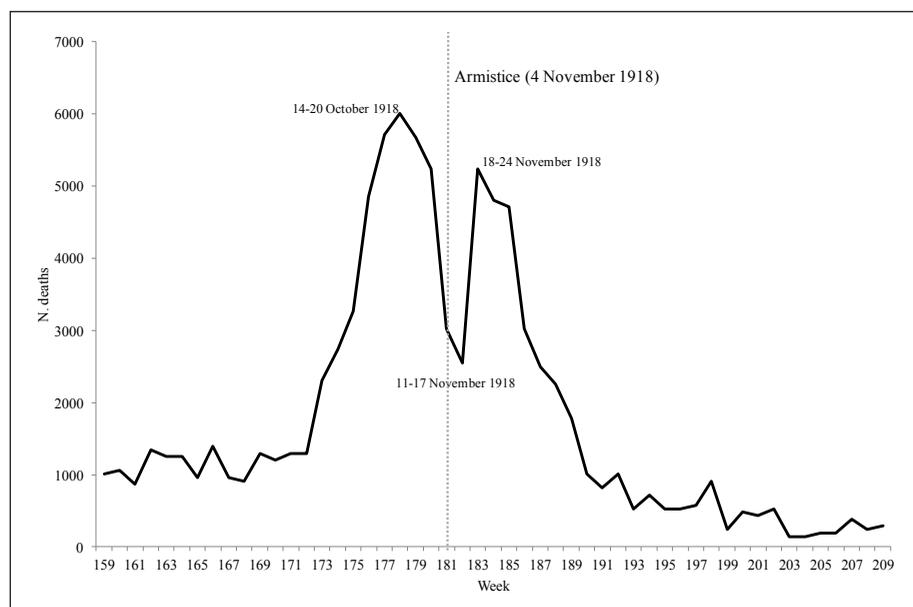
In the literature, most of the time series of Spanish flu are given on a monthly basis, as in Figure 1. These series demonstrate clearly how the deaths begin going upward in August, reach their peak in October and then come down. This trend is also confirmed by series calculated for shorter intervals, usually weekly [5, 51-54]. The same can be said about the spread of influenza and mortality among the armed forces of other belligerent countries [25]. The characteristic shape of the mortality of the Spanish flu respects the temporal development of the spread of present influenza epidemics.

However, the weekly distribution of flu deaths obtained using the *Albo d'oro* data follows an unfamiliar form of progress, which does not follow the usual pattern of the spread and mortality of flu (Figure 3).

The graph shows a totally anomalous bimodal distribution. The dates are, in this case, revealing. The first spike is recorded in the last weeks of October, there is a dramatic fall in the first half of November with a second spike at the end of this same month. The minimum point occurs in the weeks running up to the armistice (4 November on the Italian front). The distribution of soldiers' deaths, therefore, evidences an abnormal point in the closing phase of the war. The same trend is observed, though with some differences, even in some Italian regions, for which we have derived the entire series from the *Albo d'oro* (Figures 4a-4d). A further confirmation in support of the different progression of deaths among civilians and soldiers comes with the distribution of deaths from Spanish flu in Modena, the only example that we found where this distinction is observed (Figure 5).

This pattern is consistent with the information from the *Albo d'oro*. The sequence of events is compatible with a reading in which the flu among soldiers at home and the civilians had already started to fall, when new subjects, not previously affected by the disease, appeared on the scene. According to some sources, many of the soldiers who died from influenza in November were debilitated soldiers returning from prison camps, whom the disease hit with particular severity

Figure 3 - Weekly distribution of flu deaths (19 August 1918-12 January 1919) (from *Albo d'oro* [31]).



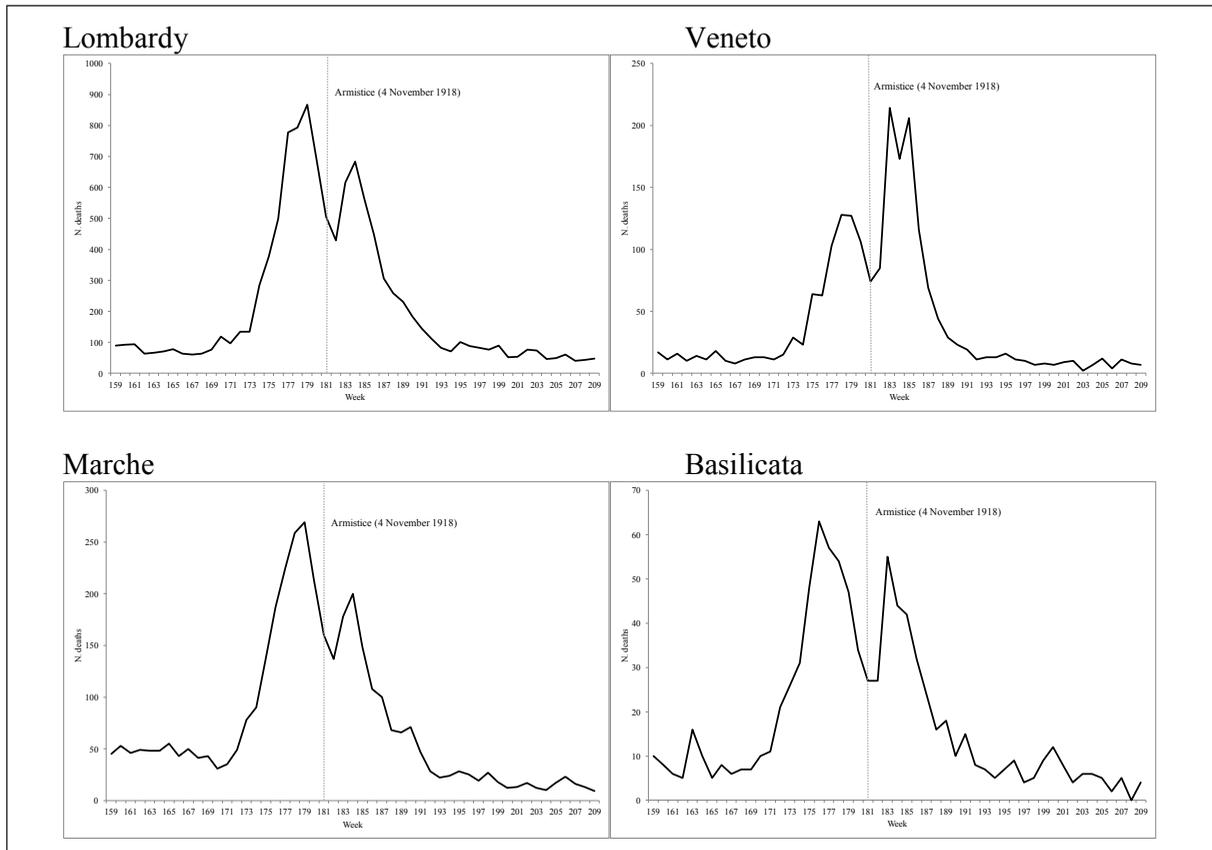


Figure 4 - Weekly distribution of flu deaths in selected regions (19 August 1918-12 January 1919) (from Albo d'oro [31]).

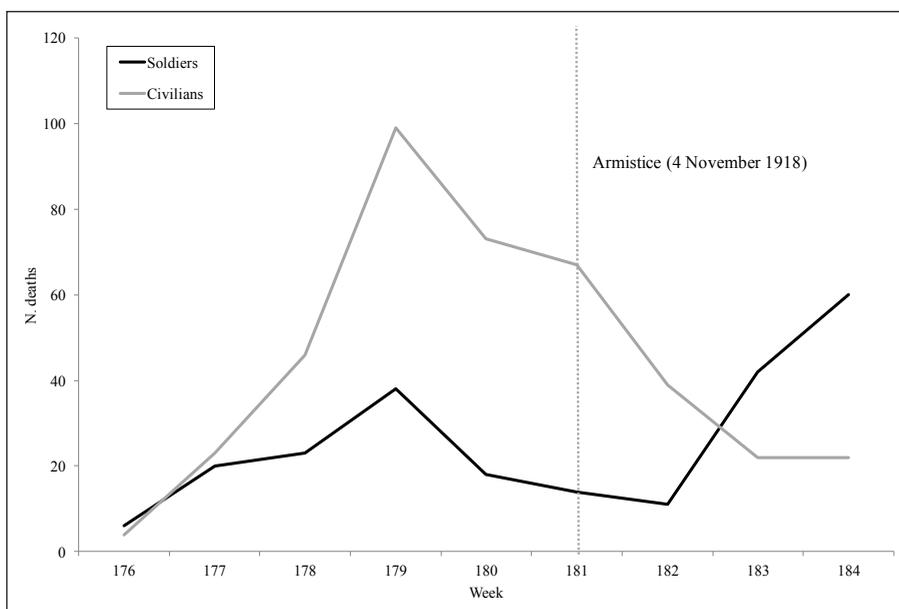


Figure 5 - Weekly distribution of flu deaths in Modena (from Ratti 2010 [52]).

[2, 55]. This was true not just in Italy, but also, for example, in France [56]. For reasons that are not clear, in fact, the Italian prisoners had not experienced, or had had little contact with the Spanish flu in the prison camps. After the end of the war, hundreds of thousands of Italian prisoners were liberated and began their journey home. Many of them, during the long return march or after entering Italy, were affected by the Spanish flu and, as shown in the various charts that we have presented, did not survive the disease. This particular sequence of events reverses, in a sense, the usual progress of an epidemic. The geographical spread of the disease did not occur as a result of the movement of sick people. Rather, many people fell ill after moving. This would not be unusual if people were transferred from a territory where the disease was not present to one where instead it was. But this is certainly not the case with the Spanish flu that was global in its reach. Many Italian soldiers sickened and died when the flu had already started to fall off. Therefore, we are left with a question that has already perplexed some contemporaries: why were the Italian prisoners, who were subjected to particularly harsh living conditions in labor camps, not infected by the influenza in their moment of greatest difficulty, while they became ill when their material conditions improved? Perhaps the flu was less strong in Austria and Germany than in Italy, and indeed in these countries flu mortality was lower. However, to be effective, this reasoning must assume that those who died of influenza once at home had not been previously sick in prison, an assumption which contemporaries also made and which puzzled them too.

■ CONCLUSIONS

In this paper, we have proposed a new estimate for Spanish flu deaths. After looking at the criteria for collecting information about deaths and their causes during the First World War, we have seen that the data was transmitted in incomplete form to the Central Statistical Office. As a result, using the *Albo d'oro*, the most detailed existing documentation on the number and demographic characteristics of the dead soldiers during the conflict, we have improved the official data about

the deaths of flu and other causes related to it. Overall, the number of soldiers who died from influenza in 1918 was approximately 70,000; of these, approximately 20,000 were not covered in official vital statistics. Given this we suggest that there were some 410,000 flu deaths in 1918, which should be raised to 466,000 if we consider the period 1918-1920.

Most scholars have suggested that there is a direct link between war and the spread of influenza. Studying the mortality of soldiers from Spanish flu, we saw that the deaths had two peaks, the first in October 1918 and the second in November. Between these two peaks, we see a substantial fall in fatalities which had its center in the week when the armistice was signed. This aspect recalls another possible link between flu and WWI that cannot be explained in terms of the usual movement of people and contagion. We have seen that the homeward return of the imprisoned Italian soldiers sparked a further upsurge in Spanish flu, but that does not explain why it was these soldiers who fell sick once the conflict ended. These are questions that do not currently have answers. The history of Spanish flu once again challenges researchers and refuses easy conclusions.

Conflict of interest

None

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