



# **The workload of the Italian military health service during the First World War A quantitative assessment**

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### Abstract

The article proposes a quantitative evaluation of the workload of the Italian military health service during the First World War. In the Great War, there were unprecedented medical and health care issues: this was a result of the size of armies, the poor living conditions of the soldiers and the introduction of new weapons. This article reconstructs some aspects of the Italian military health service in the Great War from the archive records of the soldiers who were injured, taken ill or who died during the conflict. The sources employed are reports and publications based on official sources and were edited a few years after the end of the war.

Keywords: Military health service; Italy; Injuries; Diseases; Quantitative estimates.

### **Introduction**

The First World War put an unprecedented strain on military health services. This was a result of huge armies, the length of the conflict, the movement of large numbers of soldiers, poor living conditions and new weapons.

In terms of organisation, the medical and sanitary problems of the Great War, though more variegated and complex, were essentially the same as those of the conflicts of previous decades. The treatment of large numbers of injured soldiers, who arrived in waves in field hospitals, had been a constant of battles in all wars; as were the large number of soldiers with disease. One important difference in WWI was that the number of soldiers who died from disease was much lower than the numbers who died in, or as a result of battle. The warring countries were also better able to face these problems. This was possible because of

improvements in the organisation of the military health care system and the large-scale application of new medical knowledge.

The war effort was supported not only by the Army but by the whole country. There was: civil mobilization and the reconversion of the production system. There was also society's contribution to the care and assistance of its soldiers. This commitment did not end with the conflict, because many were temporarily or permanently disabled or lived with the consequences of diseases contracted in the war.

During the war, therefore, many soldiers who fell ill or who were wounded were treated and assisted by both the military and the civilian administration. Moreover, many of them spent more or less long periods of convalescence at home, assisted by their loved ones. However, it was the task of the armed forces to provide hygiene and prophylactic measures to ensure the health of soldiers in the war zone. The armed forces had also to ensure prompt medical intervention for injuries sustained at the front or immediately behind the lines. Without wishing to play down the contribution given by organizations and civilian personnel, this article aims to reconstruct some aspects of the Italian military health services in the Great War. There are already studies that deal with this topic from the point of view of supply. They look at organizational and logistical aspects or deal with the medical and nursing staff.<sup>1</sup> However, the point of view of this article is different. The purpose is to quantify the amount of work done by the military health service terms of the demand for care and assistance. To do this we start from archive records of soldiers who were injured, who were taken ill or who died during the conflict. This demand-based analysis and its evolution during the war is a necessary starting point for quantifying not only the deployment of the material and human energies deployed by the armed forces but, in perspective, also those put to service by the whole country. This article is divided into five parts. In the second section previous research on the subject is summarised, with particular reference to Italy; in the third section the Italian military health care system during the war is briefly described; in the fourth part there are estimates, based on underexploited sources, of the numbers of injuries and diseases that medical structures dealt with from 24 May 1915, the beginning of the war on the Italian front, to its end, 4 November 1918. Conclusions are then offered.

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<sup>1</sup> Liuzzi, *I servizi logistici*; Ferrajoli, "Il servizio sanitario"; Botti, *La logistica*; Cadeddu, "La Sanità Militare"; Fabi "Le ferite della Guerra"; Ferrari and Massignani, "La crisi della sanità"; Vergani and Venturi, "The Italian mobile".

## Literature

After the end of the conflict, a number of works were published on economic and human losses and the effects of the conflict on the civilian population in all the countries involved. One of these, which particularly stands out, was the *Economic and social history of the World War*. This was funded by the Carnegie Endowment for International Peace, which printed some of the principal studies on military and civilian mortality and health.<sup>2</sup> Giorgio Mortara also published, in this series, a work which was to have a huge impact on research regarding the health of the Italian population during the conflict and estimates of numbers of human military and civilian losses during the war.<sup>3</sup> As in all the combatant nations, there was research in Italy into the number of dead soldiers and the war-time health care system more generally.<sup>4</sup>

In more recent years, research has given more consideration to the social aspects of war, which has resulted, though from a different direction, in research into health-care provisions for soldiers during the conflict.<sup>5</sup> However, there is not yet a complete reconstruction, based on quantitative data, save on mortality.<sup>6</sup>

## The Italian Military Health Services during the Great War

Before the start of the war, none of the countries involved had a military health service designed for a long-haul conflict. The urgent need for more articulated systems became, though, quickly apparent. Services were needed that would: sustain the medical and sanitary

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<sup>2</sup> On the Carnegie Foundation books see Degli Esposti, “Grande guerra e storiografia”. On France see Huber, *La population*; on Russia see Kohn and Meyendorff, *The Cost*.

<sup>3</sup> Mortara, *La salute pubblica*.

<sup>4</sup> Savorgnan, *La guerra*; Gini and Livi, “Alcuni aspetti delle perdite”; Mortara, *A proposito della mortalità*; Gini, *I morti*.

<sup>5</sup> In general see Smallman-Raynor and Cliff, *War Epidemics*; on the Great War see Delaporte, “Médecine et blessures”; Winter, “Victimes de guerre”.

<sup>6</sup> For Italy only a few works on this topic have been published. See Lenci, “I caduti dimenticati”; De Napoli, *La sanità militare*. On mental illness there are Gibelli, *L’officina della guerra*; Bianchi, *La follia*. On war illnesses see Ceschin, “I fratelli minori”; Giovannini, “Le malattie del corpo”. On warfare and nutrition see Cuzzi, “Guerra e alimentazione”. There are also studies on specific illnesses and a range of research into individual countries and this or that aspect of health and mortality including inequality and survival in the war, Fornasin, Breschi and Manfredini, “Deaths and survivors”. For France see on tuberculosis Darmon, “La grande guerre”; on gangrene Debue-Barazer, “La gangrène gazeuse”; on venereal disease Le Naour, “Sur le front intérieur”. For Italy see on tuberculosis Detti, Stato, guerra e tubercolosi; on cholera, Sema, “Civili, militari e colera”. There are also many international publications on the Spanish Flu, that is one of the most widely studied epidemics and that hit all armies hard. With regard to the Italian army, see Fornasin, Breschi and Manfredini, “Spanish flu in Italy”; Cutolo, “L’influenza spagnola”.

emergencies of battle; manage the treatment and rehabilitation of an enormous number of wounded and invalids; treat diseases and at times epidemics, which frequently hit soldiers in trenches; and that would deal with mental illness.

Right from the start there were unprecedented numbers of wounded and mutilated soldiers, and within a few months it was apparent that the types of injuries were unlike those of other conflicts. Gunshot or shrapnel wounds to the thorax, abdomen, upper limbs or head often proved fatal. Technology provided industrial applications designed to increase the destructive power of weapons. Artillery use was much greater than in previous wars, and, therefore, the number of wounds from shrapnel was much higher. New forms of attack were rolled out, meaning new measures were needed for defence and for treatment.<sup>7</sup> This was, for instance, the first time that flame throwers and chemical weapons were used to break the deadlock, even at the cost of contravening International Law. Germany was the first to use gas: it did so during the Second Battle of Ypres against French and British troops. On the Italian front, gas (a mix of chlorine and phosgene) was used for the first time by the Austro-Hungarian Army on the Karst in June 1916, resulting in more than 2,000 victims. War medicine had to treat these new and harmful chemical compounds, which sometimes irritated and sometimes poisoned victims.<sup>8</sup> Another common and highly disabling disease due to difficult line conditions was “trench foot”. It was caused mainly by vascular distress due to constant standing and the use of tight puttees associated with long exposure to cold and dampness.<sup>9</sup> In about one third of cases it degenerated into total or partially necrosis. If not treated, this could lead to death or amputation. Even in less serious cases, trench foot took fighting soldiers away from the front line for weeks on end.<sup>10</sup> During and after the war, many soldiers suffered from unprecedented mental disorders. Starting from 1915, “shell shock” became a common issue.<sup>11</sup> At the end of the war, there were, in all Europe, millions of veterans with established physical or mental impairments.<sup>12</sup> These were entitled to a pension to deal with the after-effects of wounds, diseases and infections.<sup>13</sup>

A particular aspect of the Italian military health service is given by the exceptional conditions in which, at least part of it, was operating. The Italian front ran for a length of about

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<sup>7</sup> Liuzzi, *I servizi logistici*, 101.

<sup>8</sup> Haber, *The Poisonous Cloud*.

<sup>9</sup> Peragallo, “The Italian Army”.

<sup>10</sup> Haller, “Trench foot”.

<sup>11</sup> Loughran, “Shell Shock”.

<sup>12</sup> Tanci, “Gli invalidi”.

<sup>13</sup> Quagliaroli, *Risarcire la nazione*.

600 kilometres. Only a small part of the line, the one corresponding to the southern part of the Isonzo front, was located on the Karst: a hilly, dry, harsh territory. Most of the front, on the other hand, stretched along the Alps, even at high altitudes. If the operating conditions on the Isonzo were not very dissimilar from those that were to be encountered on the western front, the situation in the mountains was very different. There, due to extreme environmental conditions, the “white war” was fought between the opposing forces on a high altitude front that often went up to 3,500 metres.<sup>14</sup> The medical services of the Italian and Austro-Hungarian armies had to face previously unimaginable challenges, in particular for the positioning of sanitary structures, not least in mountain tunnels.<sup>15</sup>

The geography of the front also affected health problems, of course. The Karst front, for instance, proved an ideal environment for the outbreak and spread of diseases. It is enough to think of the cramped trenches and barracks, with huge masses of men in shockingly unhygienic conditions. Here meals were prepared and eaten in filth, and here soldiers often drank water contaminated by human waste. In the first months of the war diseases such as typhus and cholera raged in these areas. In the mountainous areas, on the other hand, frost-bite cases were frequent during the harsh winters, especially frost-bite of the lower limbs.

As in other countries, the Italian military health service was an extremely complex machine. It employed an enormous number of men and huge quantities of materials. The health personnel worked, in part, within the fighting corps and, in part, in the health corps (Corpo di Sanità Militare), which had its own structures: health care sections (Sezioni di sanità), field hospitals and little hospitals (Ospedali and Ospedaletti); and surgical ambulances (Ambulanze chirurgiche). Alongside the physicians, on whom the attention of the scholars has focused most, there were also nurses, stretcher bearers, “health aides”, who took care of logistical aspects, pharmacists, priests and various other support employees like ambulance drivers. Research to date does not offer a historical series on military health personnel or the number of operating structures. Rather, it gives information limited to particular moments of the conflict. Also, in some cases a clear distinction is not made between military and civilian personnel and structures. However, there are sources that allow, at least as far as the armed forces are concerned, a first reconstruction of these quantities. In particular, there are: 1) data on the number of employees in the Health Service Corps in different moments of the conflict;<sup>16</sup>

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<sup>14</sup> Thompson, *The White War*.

<sup>15</sup> Angetter, *Dem Tod geweiht*.

<sup>16</sup> Zugaro, *La forza dell'esercito*.

2) information on the health staffing plan within the fighting corps;<sup>17</sup> 3) a database with the details of all the health structures of the army, operating month by month (<https://www.sanitagrandedeguerra.it/>). On the basis of these sources, and implementing some estimates, Table 1 summarises the resources deployed by the Italian armed forces for the support, care and assistance of soldiers at different dates. These figures are, in part, the result of estimates: as such they are only indicative.

Table 1. Italian health care military personnel and structures during WWI

Date	Fighting corps	Health corps	Of which physicians	Structures
01/07/1915	37,253	43,941	5,302	294
01/10/1915	38,450	61,405	6,274	351
01/01/1916	50,076	77,525	8,049	409
01/04/1916	54,351	82,855	8,672	421
01/07/1916	57,709	89,999	9,309	595
01/10/1916	63,911	100,693	10,361	655
01/01/1917	66,940	104,962	10,826	688
01/04/1917	77,312	89,615	10,923	708
01/07/1917	74,666	99,456	11,195	756
01/10/1917	76,391	100,766	11,404	717
01/01/1918	68,115	96,540	10,503	631
01/04/1918	64,232	98,146	10,260	681
01/07/1918	70,468	97,414	10,743	680
01/10/1918	68,994	93,689	10,434	684

Sources: See text.

The table refers to different moments of the conflict. As can be seen, from July 1915, when the war had just begun, until the middle of the following year, all headings increased. Those relating to the health corps grew faster, though, than those relating to the fighting corps. This perhaps was a consequence of the growing specialization of both men and tools needed for the damage industrial warfare did to the human body.

The unforeseen length of the war also increased the need for new physicians and health personnel. Thus, after the general medical mobilization of 22 May 1915, a further military plan was called for. It was necessary to turn to fifth- and sixth-year medical students, a great number of whom were sent to an *ad hoc* institute, the «Castrense University» of San Giorgio di Nogaro, a country municipality close to the frontline. There they attended accelerated

<sup>17</sup> Lambert, *Ricordi logistici*.

courses in order to serve the army as soon as possible.<sup>18</sup> In 1916, following on from an agreement between the Ministry of War and the Ministry of Public Instruction, medical students were able to take a degree in just four months at the University of Padua. In this way a university battalion of 1,300 student from different Army corps was formed. The maximum effort was deployed during 1917. In October of that year the collapse of the Italian front saw a significant loss of military personnel and operating structures.

As noted above, alongside the military structures in the war zone, numerous civilian structures with civilian personnel were active in the war effort throughout the country. From 1916 civilian personnel were increasingly employed near the front line. There are not sufficient data for a time series here. But, according to some scholars, at the end of the war, on the home front where there were already around thirty military hospitals, the army freed up 948 reserve hospitals, 146 Red Cross hospitals and other structures.<sup>19</sup> In these hospitals there were civilian personnel. An important part of this staff were female women. There were 4,000 volunteer nurses enrolled in the Red Cross at the beginning of the conflict and about 8,500 by its end.<sup>20</sup> To these must also be added the 1,500 volunteers from other humanitarian organizations. Finally, medical and nursing staff from allied countries, particularly American and British staff, were active in Italy.<sup>21</sup>

The military health service's major efforts were concentrated on foreseeable emergencies at the front. For instance, a set of procedures were established to bring the wounded in from the battlefield and subsequent referral to health centres. There were also procedures to sanitize places of combat or the supply of medical equipment. These plans had been set out in pamphlets published before Italy entered the war.<sup>22</sup>

Wounded soldiers were transported from the battlefield to medical centres, often in the trenches, shacks or nearby caves. After emergency treatment here, the wounded could be transferred to field hospitals and to mobile care units near the front. The average stay would have been brief, due to the constant arrival of new cases. There were intense often week-long periods, with wave upon wave of injured soldiers. The medical staff here medicated wounds and performed emergency surgery, such as amputations or the removal of bullets and or

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<sup>18</sup> Baldo, Galasso and Vianello, *Studenti al fronte*; Contarini, De Santis and Pitassio, *Documentare il trauma*.

<sup>19</sup> Botti, *La logistica*, 2, 780)

<sup>20</sup> Bartoloni, *Italiane alla guerra*.

<sup>21</sup> Irwin, "Nation Building and Rebuilding"; Hallett, *Veiled Warriors*, 223–4.

<sup>22</sup> Perego, *Sgombero dei feriti*; Massarotti, *Ospedalizzazione militare in Guerra*. The procedures have been reconstructed in detail in De Napoli, *La sanità militare*, 127–32.



shrapnel. In these conditions, physicians had to learn to classify injuries at sight according to the severity of their injuries: white, green, red and black in order of increasing severity. This classificatory system determined their next destination. Those deemed fit were sent back into battle while others were brought to military hospitals a few kilometres away. There less urgent surgery was carried out and there illnesses were treated. Even here the average stay would have been brief, with most of the wounded sent to internal hospitals by road, railway or sea. The total number of transfers from the war zone to the home territory was 862,000 soldiers.<sup>23</sup>

This overview has tried to identify evolutionary aspects from a quantitative perspective. However, the qualitative aspect should not be forgotten. For all the combatant countries there was, in the Great War, a strong development of medical science across a variety of fields. The spread of epidemic diseases meant greater attention to hygiene and prophylactic procedures.<sup>24</sup> The huge number of gunshot wounds led to experiments in the surgical field and research into rehabilitation techniques.<sup>25</sup> The use of gases encouraged research on the effects of chemicals on the human body and their treatment.<sup>26</sup> The widespread diffusion of mental disorders among soldiers marked the birth of war psychiatry.<sup>27</sup>

### **Quantitative Analysis**

In the Italian historiographical tradition, the reference work for the estimate of the number of wounded, sick and deaths of Italian Army is Mortara.<sup>28</sup> However, there are two practically unknown publications, that also report this information: an article written by Corrado Gini and Livio Livi in 1924;<sup>29</sup> and the collection of Corps' Historical Summaries.<sup>30</sup> The data from the three publications can be usefully compared only after some elaborations. The figures given sometimes do not match and, in some cases, are contradictory. These differences were not the result of conscious manipulation. They depended essentially on the different sources used for the compilation of the statistics.

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<sup>23</sup> Botti, *La logistica*, 2, 779. Slightly more in Ferrajoli, "Il servizio sanitario", 513.

<sup>24</sup> Sema, "Civili, militari e colera".

<sup>25</sup> Boschi, *La guerra*.

<sup>26</sup> Lustig, *Effetti e cura*.

<sup>27</sup> Romano, *Soldati e neuropsichiatria*.

<sup>28</sup> Mortara, *La salute pubblica*.

<sup>29</sup> Gini and Livi, "Alcuni aspetti delle perdite".

<sup>30</sup> *Riassunti storici dei corpi*.

Among all these works, the only one offering comprehensive data is Mortara's. Gini and Livi looked at information from 11 *Uffici Notizie* (News Offices) from the 88 scattered across Italy. The *Uffici Notizie* were created in June 1915 taking inspiration from a similar French agency. The purpose was to simplify communication between soldiers, their families and the Ministry of War. The headquarters was Bologna for army and Rome for naval personnel. Even if the data employed by these authors is not complete, the information they report should be judged representative. They distinguish both injuries and injured and, at the same time, illnesses and the ill. The collection *Riassunti storici dei corpi 1924-1931*, instead, contains data referring only to the injured with nothing about those who were under treatment for diseases. Moreover, Gini and Livi do not consider all the Italian Army, but only the infantry, including the élite corps of *Bersaglieri* and the *Alpini*. In any case, infantry had most army deaths. However, it needs also to be remembered that corps recorded deaths as they happened. They could not, for instance, include deaths after hospitalization.

Each of these sources has its weakness both in terms of completeness and data accuracy. As such we must ask which among them offers the most reliable information. Fortunately, the series above have some elements in common that permit us to make a comparison among them. First of all, the time overlap fits perfectly: all three series start counting casualties from 24 May 1915 and continue through to 4 November 1918. Secondly, none include soldiers in captivity. Their care was not entrusted to the Italian army's health system.

To ascertain the most reliable data it will be opportune to compare the historical series of injuries and diseases drawn from the different sources with those of the soldiers who died for these two groups of causes. These numbers are derived from the elaborations made on the data of the Roll of Honour of the fallen soldiers during the war: the *Albo d'oro*, that is the most reliable source on Italian war losses.<sup>31</sup> It is made up of 28 volumes published between 1926 and 1964. Its purpose was to celebrate all soldiers who sacrificed their lives for their homeland, giving their names and the cause of death.<sup>32</sup> The *Albo* was to have included all the soldiers who died in *any* military context: in battle; in captivity; from suicide; or because of disease; or accidental cause. Extraordinary, unprecedented resources were brought into play to produce the *Albo*. The meticulous search for the fallen was carried out through many

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<sup>31</sup> See Fornasin, "L'Albo d'oro".

<sup>32</sup> The criteria by which the *Albo* was compiled are set out in Zugaro, "L'Albo d'Oro", Zugaro was the head of the Army Statistical Office and the scientific coordinator of the project.

different channels that embraced different branches of government, including central and peripheral ones such as: the Civil Status Offices of the Municipalities; the Statistical Office of the Supreme Command; the Historical Office of the General Staff; the Ministry of War; the Military Health Department; the Italian Red Cross; the News Offices; the Commission for Care and Honour; and the Directorate-General for Pensions. To achieve the calculations which are present at the end of each volume, a Powers mechanical computer was employed: something almost unprecedented in Italy at this date. Despite the ambitious deployment of resources, not all the dead soldiers are reported in the *Albo d'oro*. Of course, the *Albo* did not include those executed by sentence of military courts but, in several cases, information was lacking for other soldiers. The resulting gaps, according to a recent estimate, stand at about 5.5%.<sup>33</sup>

First of all, with the support of the *Albo d'oro*, it is possible to identify the source that reports the most reliable data regarding the number of injured. The approach would be as follows: since there is an obvious relationship between the number of deaths from injuries and the number of those injured, the source where the monthly series of death from wounds is closest to that of *Albo d'Oro* is the source with the most reliable numbers for this series.

The elaborations carried out for each source to make them comparable are the following: 1) with regards to the *Albo d'oro* deaths for injuries added to soldiers missing in action have been considered. The results thus obtained have been increased by 5.5%, corresponding to the missing records in the source. The final result is 345,442. 2) With respect to Mortara, we employed data as presented in the text, without further processing. The only exception is related to soldiers who died in May and June 1915 and October and November 1918. Mortara offered these data in aggregate form, while in the comparison, deaths were distributed in different months according to the number of days spent at war. According to Mortara the number of soldiers who died from injuries stands at 378,010. 3) Data proposed by Gini and Livi refer only to deaths registered by a limited number of *Uffici Notizie*. According to their calculations, the final number of casualties was 26,128. To make this series as close as possible to the *Albo d'oro*, data about deaths have been re-proportioned on the basis of the 345,442 found in the *Albo*. 4) As far as Corps' Historical Abstracts, a more complex explanation is needed. Data regarding the Corps have been recovered from the *Corps' Historical Abstract* of each Infantry regiment, where data were based on time scans

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<sup>33</sup> Fornasin, "The Italian Army's Losses".

reflecting the employment of each unit in the war. However, even if these scans are organized in order to separate the period spent at the front from time spent in the rear, it is not possible to aggregate data per month. In order to get numbers for each month, we have assumed that death, injury and missing events were equally distributed right through the period under consideration. For instance, a hypothetical number of 1,000 injured, counted between 26 March and 4 April (ten days) means 100 injured per day. Once all the events have been made to correspond to each unit day by day, the next step is to aggregate events month by month.

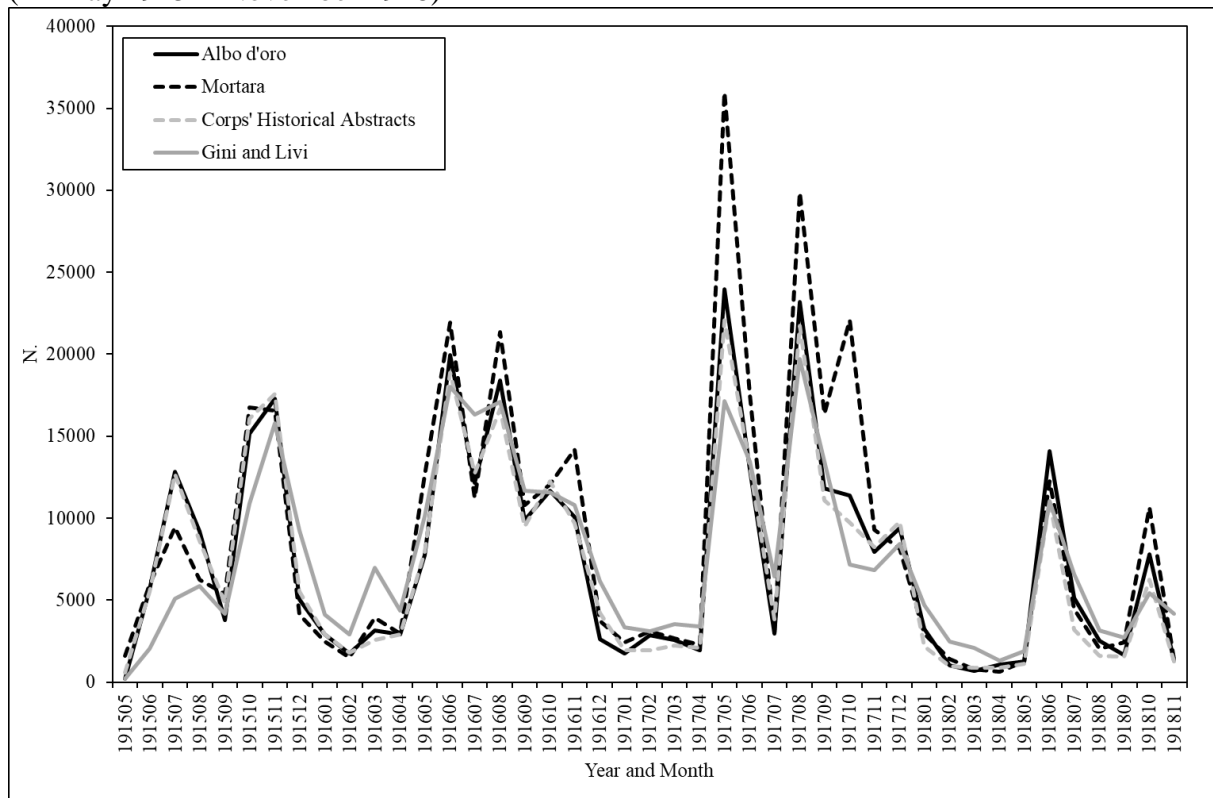
Of course, this approach entails some distortions. Nevertheless, since we are dealing with events related to hundreds of different units, and as the reported time intervals are different for each unit, the monthly trend approximation of events can be considered to be good. After having completed these calculations, it is necessary to take into account two elements: a) *Corps' Historical Abstracts* do not include soldiers who at first survived their wounds. To solve this problem, the number of deaths is increased adding 10% of the wounded (reducing their amount by the same percentage), giving us an estimate for how many of them died after being wounded. This estimate was based on some elaborations made in the *Albo d'oro* and matches the percentage calculated by other authors.<sup>34</sup> b) It is not possible to determine how many, among those missing in action, were dead or were prisoners. For this reason number of missing in action reported in this source is not considered, but, rather, those reported in the *Albo d'oro* with an increase of 5.5% to take omissions into account. After all these calculations, deaths from wounds correspond to 321,732. The monthly series of the deaths for wounds calculated on *Albo d'oro* and the three other series is showed in figure 1.

The graph shows how the data from the *Albo d'oro* and those reconstructed through the *Corps' Historical Abstracts* largely match. Instead, Mortara's series offers several discrepancies. The most important concern the great battles of 1916 and 1917. Mortara particularly offers different numbers for October 1917, the month of the battle of Caporetto, the greatest Italian defeat of the war. Gini and Livi's series show, meanwhile, a proportionally higher number of deaths than the others. The substantial convergence between data from *Albo d'oro* and from the *Corps' Historical Abstracts*, confirms the reliability of the *Abstracts* for both deaths and for the wounded. The number of injuries is 701,616 corresponding to the sum resulting from each item of the *Riassunti* reduced by 10% (the percentage of injuries which led to deaths).

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<sup>34</sup> Scolè, *Oltre i numeri*, 318.

Figure 1. Monthly series of Italian Army deaths from injury according to different sources (24 May 1915-4 November 1918)



Computing how many soldiers died from disease is more problematic. The relationship between deaths from being ill and cases of illnesses is not as strictly connected as the relationship between deaths from being injured and injuries. Furthermore, there are only two sources reporting this kind of information: Mortara’s book and Gini and Livi’s article, which have similar overall numbers but different shares between the number of those who fell ill and the numbers of those who died from illnesses. Some comparisons among series, such as data on morbidity and Spanish flu levels of lethality (always above 8%) suggest that Mortara’s figures are better here. Since at the moment it is not possible to carry out more accurate estimates, Mortara’s series are employed. The synthesis of all the elaborations described above is shown in table 2.

Table 2. Injury and disease among Italian soldiers during the First World War

	Injury	Disease	Total
Non fatal infirmities	701,616	2,754,758	3,456,374
Fatal infirmities	325,314	129,662	454,976
<b>Total</b>	<b>1,026,930</b>	<b>2,884,420</b>	<b>3,911,350</b>
Lethality (%)	31.7	4.5	11.6

The total number of entries is a little lower than four million individual episodes of infirmity and death and, therefore, offers an initial measure of the workload of the military health system during the war. The system had to accommodate around one episode of infirmity for each soldier in service during the conflict.<sup>35</sup> These estimates do not, it should be remembered, represent the total number of soldiers who died during the war. Instead, there are only the injured and ill who were in the care of the military health system. This excludes deaths in prison and a large number of those missing in action.<sup>36</sup> Some of Gini and Livi's considerations are useful for making sense of these figures. Gini and Livi were unable to use all individual records from the *Uffici notizie* because many were still incomplete. As a result their estimates should be considered as minimums. They themselves suggested that the real number of wounded, sick and dead was probably around a third higher than those reported in their findings.<sup>37</sup> Their initial study also took minor injuries into consideration, injuries that were treated by field hospitals near the front.<sup>38</sup> It is also worth remembering that many if not most fatally wounded soldiers died on the battlefield, and that, therefore, they never received medical assistance.

Another element of analysis is the ratio, calculated separately for injuries and illnesses, of the number of deaths and the total number of infirmities. For every 100 injuries that were treated in hospitals, 31.7 proved fatal, while in the case of illness this number falls to 4.5. This figure is more indicative of the generally precarious living conditions of the army, rather than the relatively small number of deaths from disease. These data on lethality are more than double those indicated by other sources.<sup>39</sup> Figure 2 shows the monthly trend of fatal and non-fatal injuries.

The two lines trend as expected; in other words the pattern for fatal injuries is almost identical to that for non fatal injuries. It is evident that both peak in times of battle. Fatal and non-fatal disease episodes are quite different in that respect, as seen in figure 3.

In this case, the two lines are more independent. Episodes of illness increase greatly over the first five months of the war, partly because of the continual rise in the number of soldiers in service. After an initial peak in the autumn-winter of 1915, the number of deaths levels off at around 1,000 a month. The highest levels of mortality before the Spanish flu came

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<sup>35</sup> Zugaro, *La forza dell'esercito*, XX.

<sup>36</sup> Gini and Livi, "Alcuni aspetti delle perdite", 306

<sup>37</sup> *Ibid.*, 271.

<sup>38</sup> *Ibid.*, 272.

<sup>39</sup> Ferrajoli, "Il servizio sanitario", 512.

in the autumn of 1915 when there was a surge in deaths from a series of epidemics, primarily cholera and gastroenteritis, which spread easily in the trenches.<sup>40</sup> These waves hit at different times in different areas: at times they were limited to one or more units operating in the same battle zone. On this occasion, the steps taken by the military health service were effective. The epidemics were contained, suitable countermeasures were quickly enforced, and a large-scale vaccination programme was swiftly initiated.

Although the military health service was successful in containing the number of deaths from illness, this was not the case with the number of sick. Besides the epidemics, illnesses such as malaria, venereal diseases, and psychological trauma were all common and, as we can see, the numbers of sick remained high throughout the conflict. There were a total of around 100,000 in the different structures. This number fell significantly in November 1917, which partly corresponds with the previous years, in particular 1916. But this is mostly attributable to a falling off in the number of troops. October and November witnessed the Italian army's most serious defeat in the dramatic Battle of Caporetto, with around 300,000 soldiers being taken prisoner in just a few days.<sup>41</sup> The reduction in the army's strength also corresponds to a decrease in patients, though the number of fatalities was largely unaffected.

Spanish flu came at the end of the war. The line for non fatal cases clearly shows the summer peak from the first wave of this disease. This peak has only a secondary effect on the number of deaths. The situation is very different in October and November when, as well as the increase in cases of the Flu, there was also a notable rise in the number of deaths more generally. This trend shows how the disease had little effect on the overall number of illnesses, but a noticeable impact on the mortality rate.

The estimate of the numbers treated for sickness in the last year of the war here is a little lower than that of the Ministry of War: 1,310,300 against 1,147,386. The reason for this is that the first figure considers too the civilians that were hospitalized,<sup>42</sup> while the second one does not.

Figure 4 shows the monthly trend of both episodes of injury and illness treated by the military health service and, therefore, gives us a time-based insight into the volume of work of the military health service during the war.

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<sup>40</sup> Sema, "Civili, militari e colera".

<sup>41</sup> Procacci, *Soldati e prigionieri*.

<sup>42</sup> Isnenghi and Rochat, *La Grande guerra*, 270.

Figure 2. Fatal and non fatal injuries among Italian soldiers during the First World War

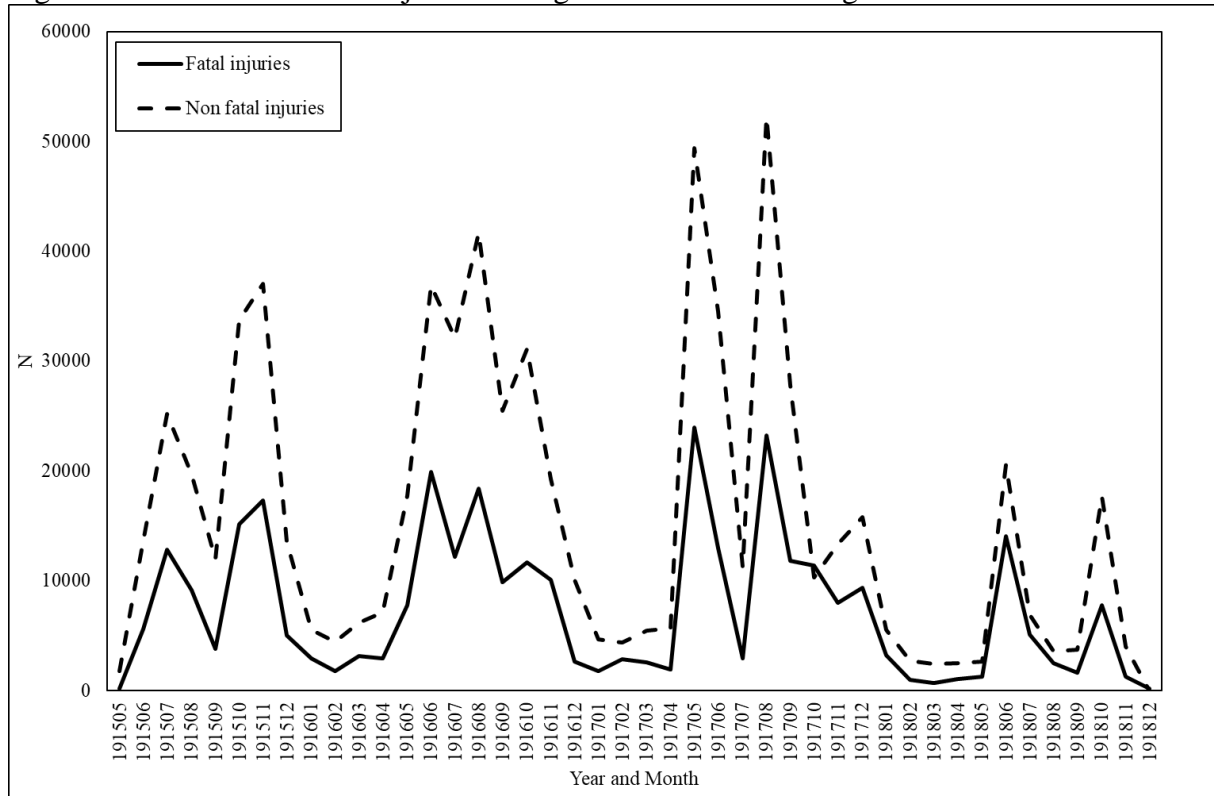


Figure 3. Fatal and non fatal illnesses among Italian soldiers during the First World War

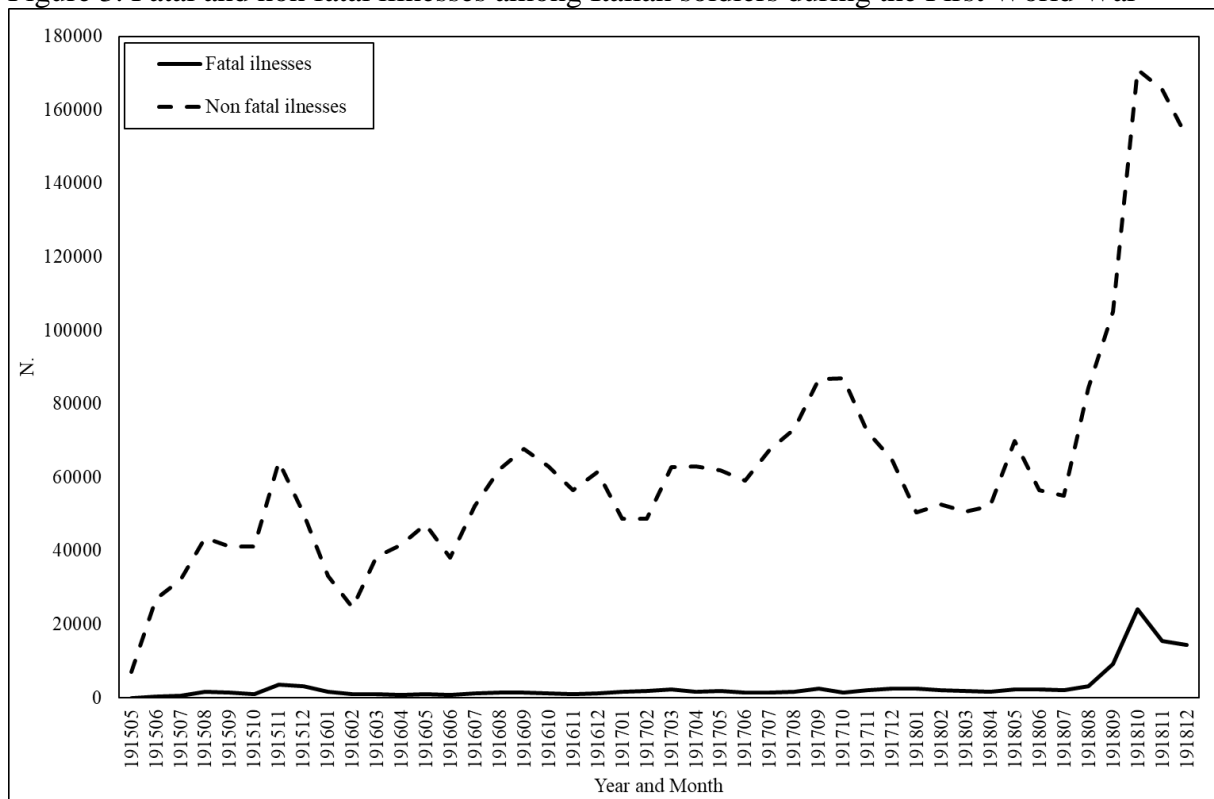
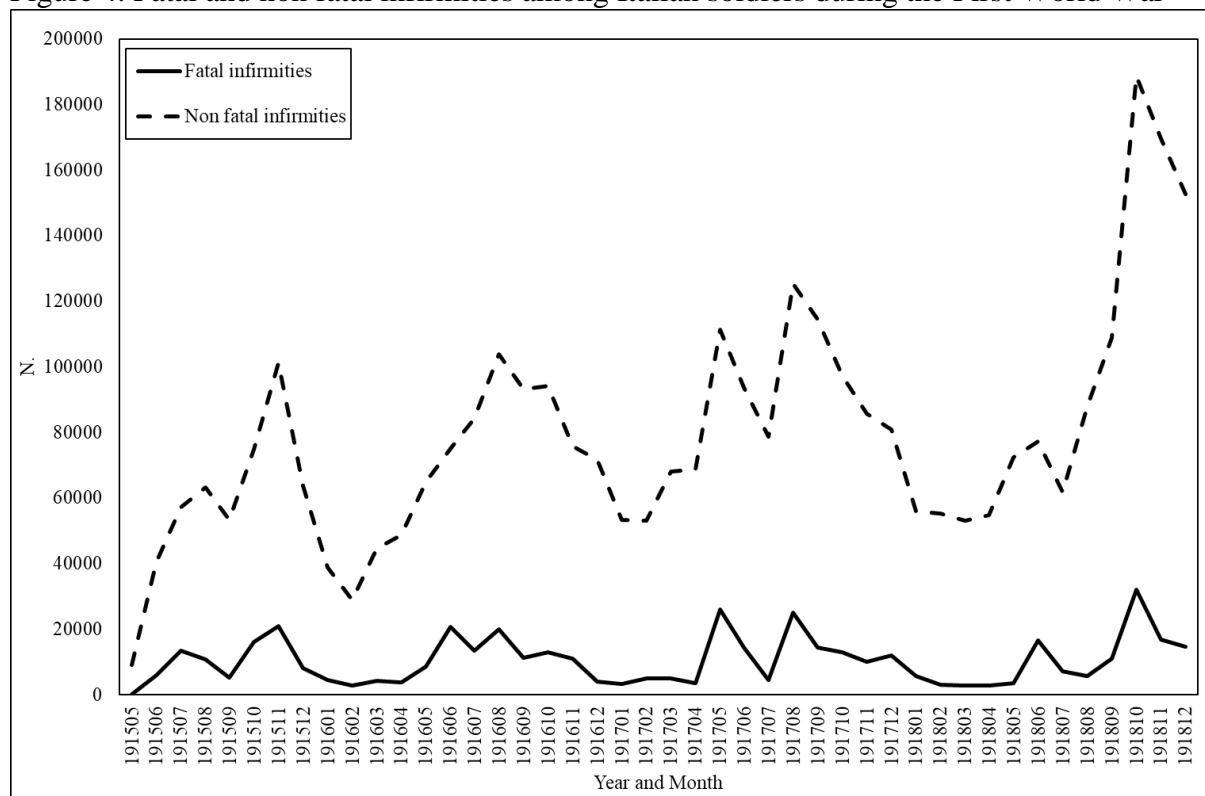




Figure 4. Fatal and non fatal infirmities among Italian soldiers during the First World War



The graph shows how many infirmities the surgical and medical centres had to deal with on a monthly basis, over the course of the war. The number of invalidities that were treated each month varied between 50,000 and 100,000, with an extreme peak, in the last month of the war, of around 200,000 cases.

## Conclusions

Despite using gross rather than exact figures, this study does succeed in outlining the task faced by the military health service during First World War. To gauge the workload of this service, according to the estimates included here, the 8,000 or so medical doctors in the war zone had, by the beginning of 1916, to treat an average of ten new casualties a month, which then probably increased for the next two years. This number may seem low, but it should be considered that this estimate includes only the infirmities that appear in official documents: the most relevant ones. Secondly, the medical services were distributed along a six-hundred-kilometre front, while the battles or epidemics, with the exception of the Spanish Flu, were much more localized. When attacks were planned, the medical services acted accordingly, but

in the event of unforeseen enemy attacks, the medical staff had to deal with sudden admissions that were tens if not hundreds of times higher than normal. In terms of states of emergency, the greatest war effort was made by the mobile hospitals and emergency surgery structures near the front. These places had to respond quickly to the tens of thousands of often seriously wounded soldiers who arrived there. The treatment of diseases, however, mostly fell to the hospitals, both field and territorial. Except with the Spanish Flu and, to some extent, the epidemics at the end of 1915, there were no real emergencies. We mean by this that the flow of patients was less prone to sharp variation, unlike that of those who were injured. It was also relatively easier to organise transfers between structures.

In conclusion, though these findings are limited, they do suggest new lines for research on military health services. We would pick out four for particular attention. First, wartime health care studies, to use terms from economics, investigate supply, rather than demand. They study how many doctors, nurses, and health structures there were and not how many injured and sick arrived in those structures. Taking into consideration the supply side does not allow us to quantify demand. But the study of demand is the only way to analyse the effort sustained by the care system, put in place by the whole country and not only by its armed forces. This leads us directly to the second research topic, to which the first is closely related. Until now, all the information we have collected and almost all previous studies refer to the incidence of injuries and illnesses. As such they systematically ignore a question that is perhaps more important: prevalence. Even an average stay of just a week per patient means multiplying the number of people who simultaneously needed care by seven. This, therefore, shifts significantly our perception of the volume of work performed by the Italian military and non-military health service. Third: we do not know how long a wounded or ill soldier was unable to serve and, therefore, after how many days, weeks or months he could go back to fighting or if, instead, he had to be discharged or given over to others tasks. This question is fundamental for understanding the needs of the army from the point of view of managing the country's demographic resources. The last point concerns more specifically logistics. We know the organizational apparatus at the ground of the health system of the Army from previous studies. However, we have little quantitative information on: how many wounded and sick soldiers were moved; in what order they were moved; and in what timeframe they were shifted from the care facilities placed close to the front line to those in the rear. The answers to the four research problems that we have indicated were, for contemporaries, of crucial importance for the management of the war. In fact, to face these challenges, some of

the top statisticians operating in Italy were placed in the ganglia of the logistics of the armed forces.<sup>43</sup> From a historical point of view, even a partial answer to these questions would allow us to shed more light on the organization of the armed forces of all nations, in a conflict that marked the emergence of many new health care problems on a previously unimaginable scale.

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<sup>43</sup> Prévost, “The long Great War”.

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