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Surviving the Deluge: British servicemen in World War I

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ABSTRACT

We estimate the correlates of death and injury in action during the First World War for a sample of 2400 non-officer British servicemen who were born in the 1890s. Among these 13.1% were killed in action and another 23.5% were wounded. Not surprisingly we find that the probability of death or wounding increases with time in the army and was higher among infantrymen. For a serviceman who enlisted in the infantry at the beginning of the war and continued in service, the probability of being killed in action was 29% and the probability of being either killed or wounded in action was 64%. We examine, for ordinary soldiers, the hypothesis that death and injury was more likely for those from higher socioeconomic backgrounds as is suggested in the literature on the 'lost generation'. While such selectivity applies when comparing officers with other ranks it does not apply among the ordinary soldiers who comprised 95% of the army.

1. Introduction

If I should die, think only this of me:
That there's some corner of a foreign field
That is for ever England.
From: "The Soldier", by Rupert Brooke (d. 23rd April 1915)

What passing-bells for these who die as cattle?
Only the monstrous anger of the guns.
Only the stuttering rifles' rapid rattle
Can patter out their hasty orisons.
From: "Anthem for Doomed Youth", by Wilfrid Owen (d. 4th November 1918)

As these quotes from two celebrated British First World War poets illustrate, gung-ho enthusiasm about the risks of death early in the war turned to deep pessimism by its end as the horror of the mounting carnage unfolded and a sense of fatalism set in. Much has been written about the experiences of British soldiers in the trenches of France and Flanders, and this literature has had a profound and enduring influence.[1] It provides one of the main underpinnings of the idea of the "lost generation". While much of the literature focuses on the effects of disillusionment on postwar culture, here we focus on the direct demographic effects.[2] This thread of the lost generation literature emphasises two dimensions: one is the scale of death and disablement among the generation of men born in the 1880s and 1890s. The other is that those who lost their lives or were seriously incapacitated were the most talented products of the public school system or were from among the more able and industrious of the middle classes (Pound, 1964). According to this view, "This process of reverse selection had meant 'failure and calamity in every department of human life' and was held responsible by some for the decline of England and the coming of the Second World War" (Wohl, 1979, p. 113; inner quote from Brittain, 2004 [1933], p. 653).[3]

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[1] This literature is examined in forensic detail by Fussell (1975) and the upper class origins of the 'myths' promulgated by it are discussed by Wohl (1979) and Parker (2007). The 'Deluge' in the title of this paper comes from a speech at the end of 1915 by David Lloyd George, then UK Minister of Munitions, who used the word to portend the coming social convulsion wrought by the war; it also appears in the titles of books on the war's wider consequences by Marwick (1991) and Tooze (2014).

[2] The idea that the generation of 1914 forsook Victorian values and adopted dissolute lifestyles is said to have been initiated by Ernest Hemingway in his (1926) novel *The Sun Also Rises*.

[3] Or as Fussell (1975, p. 365) puts it: "The effect of the war in Britain was catastrophic: a whole generation was destroyed that might have furnished the country's jurists, scholars, administrators and political leaders. As one soldier wrote of the numberless dead lying out in No Man's Land, 'They are England's flower, / the men that England can ill afford to spare'."

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The best-known memoirs of death and despair in the war are by those who served as junior officers, such as Edmund Blunden (1928), Robert Graves (1929) and Siegfried Sassoon (1930). Historians have often followed their lead by focusing on the losses among the scions of the most privileged elite and this has been supported by quantitative analysis showing higher fatality rates among officers than among the lower ranks (Winter, 1977, 2003 Ch. 3). In the more recent literature, increasing attention has been paid to the experiences of ordinary soldiers who formed the bulk of the army and for whom the conditions of service and the risks involved were rather different from those of commissioned officers (Winter, 1979).[4] But while historians have provided scattered quantitative evidence suggesting higher casualty rates among those from middle-class backgrounds (e.g. Gregory, 2009, Ch. 4), it remains unclear whether 'lost generation' selectivity applies also to the lower ranks who, after all, comprised more than 95% of the army. And what evidence there is places more emphasis on the death tolls than on the far larger numbers who were wounded but survived.

Was the probability of death or injury completely random as some accounts seem to imply? Or did it depend on the background characteristics of the individual, and if so in what ways? As Wohl (1979, p. 114) notes:

> Survival had little to do with purity or nobility, though one could argue that stronger and better-nourished men from the more affluent sectors of society had a greater chance of withstanding the rigors of the climate, the danger of infection, and the fatigue brought on by hard physical labor and irregular sleep. Many were killed because they were too tired to take cover or too wet and miserable to care whether they lived or died. Intelligence also helped in staying alive: Some soldiers stubbornly refused to wear gas masks or neglected to inform themselves about snipers when entering new sectors."

Yet to date there has been no quantitative analysis of the individual selectivity of death and injury among ordinary soldiers.

In this paper we examine the correlates of death and injury in action for a sample of 2400 ordinary servicemen who were born in the 1890s. Of these, 13.1% were killed in action and another 23.5% were wounded. Some of the findings are intuitive but they are nevertheless worth quantifying. These are that death or injury was more likely the earlier in the war the serviceman enlisted and that it was far more likely for those who enlisted in the infantry than in other branches of the army. We find that, for a serviceman who enlisted in the infantry at the beginning of the war and remained in the army, the probability of being killed in action was 29% and the probability of being either killed or wounded in action was 64%. These figures help to underline why the war has such a grim reputation for mass slaughter and butchery of a generation of the nation's youth when the overall fatality rate was 'only' 11% for the army as a whole.

We also ask whether the serviceman's probability of survival was associated negatively with his socioeconomic background, consistent with the lost generation narrative. Investigating the links between death or injury and the individual's family background, we find that those who grew up in white-collar headed households were, if anything, less likely to be killed or wounded than those from blue-collar backgrounds. Nor is there any evidence of higher than average casualty rates among those who were taller and fitter, as reflected in their heights and assigned medical grades. So while the idea that death and injury among the 'lost generation' fell most heavily on those higher up the social scale applies when comparing officers with other ranks, it does not apply within the ranks ordinary soldiers who comprised the overwhelming bulk of the army. Although these estimates are conditional on the date of enlistment and the branch of the army in which the individual enlisted, we find no evidence that individuals who enlisted early in the war or who joined infantry regiments were positively selected by socioeconomic background.

Quantitative studies of the incidence of death and injury in war have focused on more recent conflicts: the Second World War, the Korean War, the Vietnam War and the Iraq War. Kriner and Shen (2010) find that American soldiers who died in these wars have come increasingly from more deprived localities, in part due to selection into the military (Wilson, 1995). In the Second World War soldiers from backgrounds higher up the social scale suffered higher death rates. However, military structures, tactics and technology, the disease environment and medical knowledge and procedures for dealing with trauma were very different before 1940 (Cirillo, 2008). Consequently, the findings for later wars may have little correspondence with the incidence of death and injury in the First World War.

The small but emerging literature on the individual-level correlates of the probability of death in the First World War presents mixed results. Fornasin et al. (2019) analyse a sample of 62,000 soldiers from Fruili, Italy where 9.2% of young men died in the war. They found that the odds of death were higher among infantrymen, those with low status occupations, with low levels of literacy and of shorter stature, and those with backgrounds in agriculture or construction. However, the authors were not able to separate officers from other ranks or to account for the duration of service during the war. Guillot and Parent (2018) examined a sample of 17,000 French soldiers from the database *Morts pour la France*, to assess the survival durations of those who ultimately died in the war. While the average survival time was 18 months, officers and those not in infantry regiments at the time of death had longer survival durations from the beginning of the war. However, the database does not include exact dates of enlistment and the analysis focuses only on those who died, excluding those who survived to the end of the war.

Kesztenbaum (2018) analyses the probability of death using service records of 2000 French conscripts, linked to a range of individual and contextual variables, with a focus on social class. He finds that those with fathers in white-collar occupations had lower risk of death, but the correlation with father's wealth was more ambiguous. Although duration of exposure is not analysed directly, those in birth cohorts 1885–95 and those in the infantry experienced higher death rates. In a sample of 6300 Australian soldiers from a full life-course study, McCalman et al. (2019) find that the probability of death was highest among infantrymen and junior officers and was also positively associated with elite education and with height. In contrast, the only previous study of British soldiers (not including officers) finds that, in the presence of few other controls (not including date of enlistment), those who survived were taller than those who died (Kanazawa, 2007).

Our paper advances this literature by focusing on injury as well as death, by including the duration of exposure and by accounting more fully for the serviceman's childhood background. The rest of the paper proceeds as follows. We first examine patterns of recruitment, service and casualties for the army as a whole from official statistics, and then describe our sample of servicemen and their characteristics. We then explore the correlates of enlistment dates and enlistment in the infantry. This is followed by the main part of our analysis, estimating the correlates of the probability of death or injury, first with probit regressions and then with a duration analysis. The conclusion summarises our findings.

2. Life and death in the Great War

About 6 million men served in the British forces between 1914 and 1920. Of these, the vast majority, more than 5 million, served in army regiments, either in the regular army or in the Territorial Force. At the

[4] These include memoirs, most of which emerged decades after the war, such as those of George Coppard (1969), Giles Eyre (1991), Charles Horton (2013), John Lucy (2001) and Edward Lynch (2008).

outbreak of the war in 1914 there were 247,000 serving in the regular army and 269,000 in the Territorial Force.[5] As illustrated in Fig. 1, the army grew rapidly in the first few months of the war followed by a steady increase over the next three years. It reached its maximum regimental strength of 3874,928 in October 1917, when it comprised 143,298 officers and 3731,630 other ranks. At that time the infantry accounted for 47.8% of the total regimental strength while the Royal Horse and Field Artillery, the Royal Engineers, the Royal Army Service Corps and the Labour Corps each accounted for between five and ten percent of the total. Of the total strength, officers (those with commissions) accounted for 3.8% while other ranks, up to and including staff sergeants and warrant officers, made up the rest. On average about half of the total regimental strength was serving overseas at any one time.[6] Further details of army service are provided in Appendix 1.

Fig. 2 shows the enlistment rate by month. As is well known, men flocked to the colours in August and September 1914 when three quarters of a million enlisted. In the following year enlistments averaged more than 100,000 per month but with a downward trend. In the first phase, enlistment was voluntary but it was restricted to men aged 18–41 who were passed as fit for service, although some were under-age and some were subsequently found to be unfit for active service. In the face of declining enlistment, the so-called Derby scheme registered the remaining men of military age, exempting those in essential occupations and placing pressure on the others to join up in a sequence of groups according to age and family circumstances. This halted the decline in enlistments but did not meet the ever-expanding needs of the army, resulting in the introduction of conscription from 2nd March 1916. Conscription applied to all unmarried men aged 18–41 who were not in reserved occupations; it was quickly extended to married men and later to men over 41. Conscription was not applied in Ireland (Simkins, 1988, Ch. 5).

Of those who joined the army from August 1914 onwards, 53% enlisted before the introduction of conscription and 75% had attested by February 1917. Over the period of the war total recruitment amounted to almost 5 million and, when those in the regular army and the territorials at the outbreak of war are included, the number of men who served in the army during the war amounted to 5.21 million. This is about half of all eligible males (including the Irish).[7] Of this number most would not have served for the entire war, either because they enlisted sometime after the beginning of the war or because they were killed, seriously wounded or were discharged from the army before the armistice for other reasons.

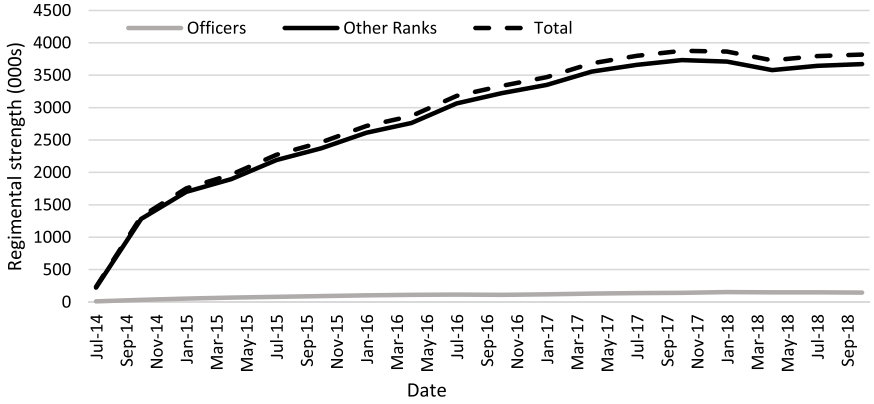

Fig. 1. Regimental Strength of the British Army, July 1914 to October 1918.
Source: Calculated from *General Annual Reports on the British Army* 1921, pp. 17–21.

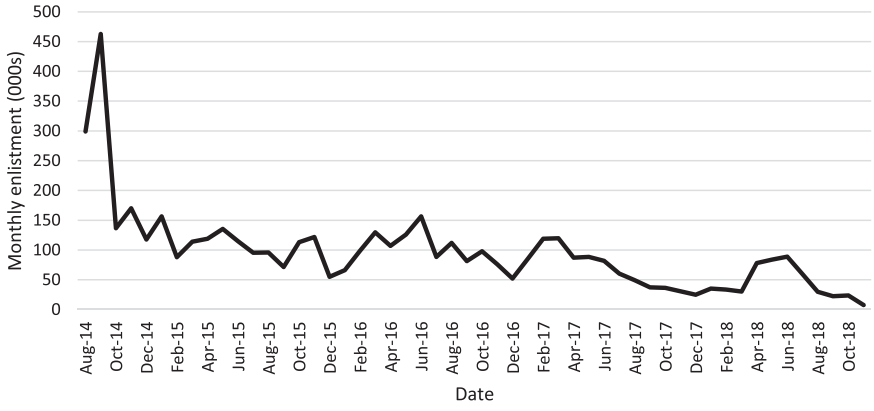

Fig. 2. Monthly enlistments August 1914 to November 1918.
Source: *General Annual Reports on the British Army* (1921), p. 60.

[5] In addition, the Army Reserve, the Special Reserve and the Territorial Reserve amounted to 211,000 on 1st August 1914 (*Statistics of the Military Effort of the British Empire during the Great War, 1914–1920* (1922), p. 30).

[6] The percentage serving abroad on 1st October increased from 25.4% in 1914 to 53.9% in 1916 and 62.8% in 1918 (Britain, 1921, pp. 52–56).

[7] Dividing the number who served by the male UK population aged 15–44 in 1911 gives 50.11%.

Table 1
British servicemen killed, wounded or missing in the First World War.

War theatre		Killed, died of wounds or died of other causes	Wounded	Missing including prisoners of war
France/Flanders	Officers	29,899	68,241	8440
	Other ranks	480,932	1456,091	228,133
Other theatres	Officers	3438	5841	922
	Other ranks	59,238	113,296	16,681
Total	Officers	33,337	74,082	9362
	Other ranks	540,170	1569,387	244,814
	All ranks	573,507	1643,469	254,176
% of served		11.01	31.55	4.88

Source: General Annual Reports on the British Army (1921), p. 71–2.
Notes: The number of deaths, wounded and missing are from 4th August 1914–30th September 1919. Of the prisoners of war 154,308 had been released.

Table 1 shows the number killed wounded and missing, up to September 1919. Overall, the number reported as killed is 573,507, most of whom died in France and Flanders or as a consequence of serving in that theatre of the war. Overall, among those who served, 11% died, although the percentage was considerably higher for officers than for other ranks. Of those who died, about 60% were killed in action while a further 24% died of wounds and 16% died as a result of disease or injury.[8] The number wounded is about three times the number killed, although around 8% of these represent multiple instances of wounding for the same soldier.[9] More than 80% of those who were wounded and more than 90% of those who suffered disease or injury recovered sufficiently to return to duty.[10] Those who were missing, and presumed dead, are included as killed. Of those reported only as missing, 60% were prisoners of war who subsequently returned.

Fig. 3 shows the monthly deaths per thousand of army strength at the beginning of the month. These figures are shown separately for officers and other ranks. The graph shows the concentration of deaths at times of major battles on the Western front, notably the Marne and Aisne in 1914; Festubert and Loos in 1915; the Somme in 1916; Arras, Messines and Ypres in 1917; and the second battle of the Somme and Cambrai in 1918. The higher fatality rate among officers stands out, especially at times of intense fighting when total casualties were high. The average monthly fatality rate from August 1914 to November 1918 was 5.76 per thousand among officers and 3.12 per thousand among other ranks.

Fig. 4 plots survival rates calculated from the aggregate data by cumulating the monthly survival rates. For a serviceman who joined the army at the beginning of the war the probability of survival to the end of the conflict is 0.74 for officers and 0.85 for other ranks. For servicemen exposed to the risk of death in the army only from the beginning of conscription in March 1916, the probability of survival, so calculated, is 0.83 for officers and 0.90 for other ranks. These numbers are useful as a rough guide to how average survival probabilities depend on the length of exposure although they fail to capture the risks that faced different individuals and groups. For that we need to examine individual- level data.

3. A sample of soldiers

To examine individual experiences of British soldiers during the Great War we use a random sample of servicemen from the surviving army service records. These come originally from the National Archives collection, file WO363, which has been made available on Ancestry.co.uk, largely for the benefit of genealogists. The service records contain details of around two million servicemen but they do not include those who joined the army on commission as officers. The records were sampled by taking the first 2% of each three-letter combination beginning each surname for about one-third of such combinations. The sample was restricted to those who, based on the initial search, were born in the 1890 s. We further restrict the sample to those who were born in England and Wales in order to facilitate linkage to their childhood

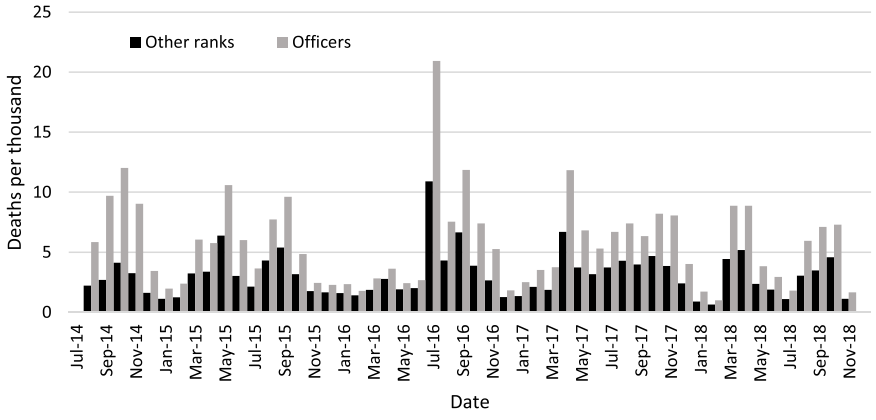

Fig. 3. Monthly death rate per thousand of officers and other ranks
Source: Deaths from Statistics of the *Military Effort of the British Empire during the Great War, 1914–1920 (1922)*, pp. 253–323. Regimental strength from General Annual Reports on the British Army (1921) pp. 17–21.

[8] These figures, from Mitchell and Smith (1931) p.12, are for 1914–1918 and include Dominion forces.

[9] Strict conditions were applied in granting disablement pensions, which numbered 634,897 by the end of March 1919 and of which 96% were granted on a temporary basis subject to review (*General Annual Reports on the British Army* (1921), p. 79).

[10] Mitchell and Smith (1931, p. 20) estimated that among British and Dominion soldiers who were wounded 64% returned to front line while 18% were returned to other duties; for those who suffered disease or non-combat injury 84% returned to the front line and 9% to other duties.

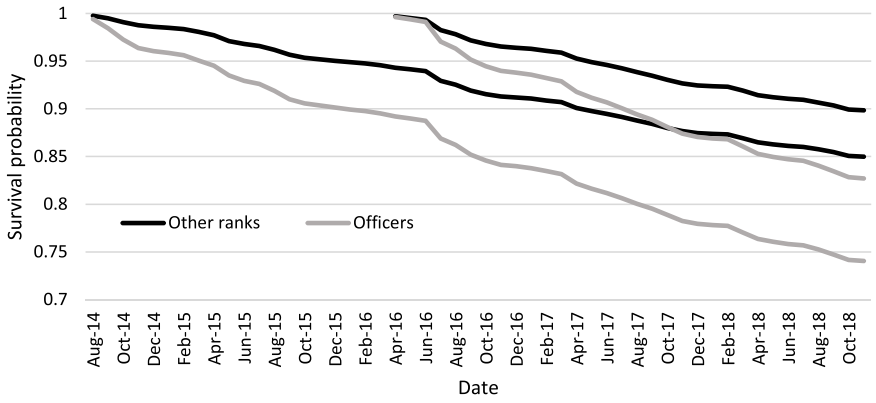

Fig. 4. Projected survival rates from August 1914 and March 1916
Source: Calculated from data underlying Fig. 3.

Table 2
War service and individual characteristics of 2406 servicemen.

	Mean	Std. Dev.
Service records		
Killed in action %	13.09	3.37
Death by other cause while in service %	1.37	11.63
Wounded in action (if not killed in action or otherwise deceased) %	23.48	42.40
Other sickness or injury (if not killed, died or wounded) %	26.89	44.35
Enlistment date (year)	1915.42	1.21
In army at onset of war (August 1914) %	9.27	29.01
Still in army at end of war (December 1918) %	72.65	44.58
Months service in army during the war	36.01	13.63
Enlisted in infantry regiment	51.29	50.00
Height on enlistment (inches) *	66.05	2.58
Medical grade A (%) *	71.83	44.99
Childhood circumstances (in 1901)		
Birthdate (year)	1894.89	1.87
Household head white-collar occupation (%)	13.51	34.18
Single parent family (%)	8.98	28.59
Number of children in family	4.12	2.08
Agricultural county (%)	14.05	34.76
District infant mortality rate (per 1000)	152.19	28.88

Sources: See text. *Height is reported for 2268 and medical grade for 2155 servicemen.

household in the 1901 census. As this cohort of men was relatively young at the outbreak of the war, most were unmarried and hence their next of kin was normally a parent, which helps in linking back to the census. In total our sample comprises records for 2956 servicemen of whom 2522 were successfully linked.

The service records are particularly challenging to use, not least because a large part of the original archive was destroyed in a fire in 1940 at the War Office Army Records Centre, from which only about 40%, subsequently known as the 'Burnt Documents', could be saved. The individual records that remain are sometimes damaged and incomplete but by sifting through them it has been possible to obtain key data for most of those that were sampled. The attestation form provides the date and regiment of original enlistment; this together with the medical inspection report also provide other details such as age, height, residence and next of kin. Details of a death often appear on the service record and in other documents, and this was verified from the website of the Commonwealth Graves Commission. Wounds and hospitalisation were usually recorded and dated in the service record and could often be identified, verified or cross-checked with other forms such as those giving decisions on applications for disability pensions. Incidence of other injury, sickness or disease are often recorded but are less comprehensive because of missing records. Dates and details of discharge appear on a range of documents, often in the form of a stamp, and usually also include the reason for discharge according to the numbered list in paragraph 392 of the King's Regulations (1912).[11] Dates of entry and exit from the army were obtained for 2406 servicemen although other details are sometimes incomplete.[12] The sources and methods used in constructing the sample are discussed in more detail in Appendix 2.

Table 2 provides some descriptive statistics. 13.1% of the servicemen were killed in action, which includes those missing in action and presumed dead. This is higher than the figure from the aggregate statistics, but the sample consists of young and mostly fit recruits who enlisted early in the War and were more likely to see action on the front line. Many of them died of wounds somewhere along the chain from bearer post to dressing station to casualty clearing station.[13] Another 1.4% died from other causes, mainly from diseases such as dysentery and pneumonia. Among the survivors, 23.5% were wounded in action, typically from gunshot or shrapnel wounds or from gas poisoning.[14] For those who were not wounded in action, other illnesses were common but are under-recorded in our data. These range from heart diseases and lung diseases to malaria, influenza, scabies, trench feet, fractures and contusions, and often resulted in hospitalisation.[15] Among our sample of servicemen nearly two thirds experienced either death, injury or illness. These figures attribute to each soldier only his most severe trauma and it should be noted that many suffered multiple instances of injury and infection.

[11] Appendix 1 Table A1.1 presents the 28 different causes of discharge. A separate but similar list of regulations applied to the Territorial Force.

[12] Strictly speaking these are spells of army service which include transfers between regiments and across different functions. If a serviceman left the army and then later re-joined, these spells were merged into one if the gap was short and the records could be linked or were kept in one file, but such events appear to have been rare.

[13] See Mitchell and Smith (1931) for details of the front-line medical services and, for a personal memoir, see Horton (2013).

[14] The ratio of wounded to killed in action Table 2 (1.6) is lower than that from the official statistics in Table 1 (2.9). However, the latter includes multiple wounds to the same soldier (including those subsequently killed in action) whereas in Table 2 each soldier is included only once. The official data also includes wounds and fatalities not sustained in action. Cases of shell shock that were entered as such are included, but this was often not recognised, especially early in the war (Leese, 1997; Jones et al., 2007). Cases of 'debility' or 'neurasthenia' are more often listed but these embrace a wider range of disorders. As Robert Graves notes in his memoirs, such conditions, characterised by apathy, chronic tiredness and reduced efficiency were common among those serving for extended periods in the trenches (Graves, 1929, p. 143).

[15] The causes of some hospitalisations were listed only as NYD (not yet diagnosed). Some diseases such as trench fever were not well understood (Atenstaedt, 2006; Anstead, 2016), and fevers were often listed as PUO (pyrexia of unknown origin).

Enlistment dates range from 1908 to 1918 with a mean 5 months into 1915. 9.1% of the servicemen were already in the army (including the Territorials) before the outbreak of war in August 1914. On average, they enlisted fairly early in the war and nearly three quarters of them were still in the army at the end of the war, taken here as the end of 1918.[16] As a result, the average length of wartime service was 36 months out of a possible 52 wartime months. Those who were discharged before the end of the war included some who, shortly after enlistment, were deemed "unlikely to become an efficient soldier" (KR 392 (iii)) and others who were "no longer physically fit for war service" (KR 392 (xvi)). But as these figures imply, many of those who suffered serious injuries or illnesses remained in the army until the end of the war. While most returned to active service, others were redeployed to home duties or remained in army hospitals or convalescent units.

An important piece of information is the regiment that was joined upon attestation. Before the advent of conscription, this was chosen by the recruit and it was often the 'local' regiment, especially among those joining territorial battalions.[17] Different parts of the army experienced very different casualty rates. Casualties were much heavier in some regiments and battalions than others. But the most important distinction is between servicemen in infantry regiments who fought in the trenches and others such as those in the Royal Engineers, the Royal Army Service Corps and the Royal Army Medical Corps who, although not directly engaged in combat, were sometimes exposed to it.[18] We classify cavalry, guards and yeomanry regiments as infantry, as well as territorial infantry regiments that were not attached to a regular army regiment. On this definition more than half of the servicemen joined infantry regiments. Shortly after enlisting, recruits were subject to a medical examination which recorded, among other things, height in feet and inches. Of those for whom we have this measurement the average height is five feet six inches (168 cm).[19] Medical examinations were extremely cursory, and recruits were typically assigned a grade from A to D, where A implied fitness for foreign service, although other grading scales were also used.[20] Among those for whom we have an entry for medical grade, more that 70% fall into the highest category, A.

Aspects of the serviceman's household circumstances during childhood are obtained by finding him in the 1901 census and then by using the place of residence to link, by registration district, to information in the Registrar General's *Decennial Supplement for (1901)*. 13.5% of the servicemen grew up in households the head of which (normally the individual's father) was in a white-collar occupation. Only one parent was present for nine percent of the soldiers. On average, the individual was one of four children in the household, although the family was not necessarily complete in 1901. 14% grew up in what the Registrar General classified as an agricultural county. The average infant mortality rate in the registration district over the decade of the 1890s for these households was more than 15% of births.

4. Selection into the army

Those from white-collar backgrounds may have suffered more as a class if a larger proportion of them enlisted in the army. The lost generation literature suggests that this is an important feature as the rush to enlist early in the war, driven by patriotic enthusiasm, was particularly strong among those from more privileged backgrounds, who did not want to miss the action. But on the other hand, it is also noted that the surge of enlistments in 1914 and 1915 included miners and skilled workers in industrial sectors such as iron and steel, engineering and chemicals, where working conditions were harsh. Nevertheless, Winter (1977, p. 454) shows that, of the men who joined the forces between August 1914 and February 1916, more than 20% had previous occupations in finance and commerce, professions and entertainment, which together accounted for only 15% of male employment in July 1914.

From the middle of 1915, a series of measures was introduced to protect workers in strategically important sectors such as munitions, shipbuilding, transport, mining and agriculture. Those in reserved or scheduled occupations were mostly skilled manual workers, notwithstanding dilution agreements which allowed for the substitution of women for men and the 'combing out' of men from key industries towards the end of the war (Wolfe, 1923, Ch. 4; Pattinson et al., 2017, Ch. 2).[21] Dewey (1984, pp. 205–6) shows that by July 1918 enlistments of men from commerce, finance and services were 63% of the July 1914 labour force compared with 45% from manufacturing, 35% from agriculture, 38% from transport and 39% from public services. It should be noted, however, that these statistics refer to all branches of the forces, including the navy and the air force, which comprised about 15% of total military strength. Also, they refer to the employment of servicemen in sectors of industry that include a wide range of occupations with different social statuses. Finally, they relate to servicemen of all ages and to their own occupations, not to their family backgrounds.

We can compare the backgrounds of our sample of servicemen with the population from which they were drawn. The occupations of the heads of the households in which the servicemen grew up are mapped into the individual occupational codes and then into the Registrar General's social classification based on the 1921 census. For comparison, we take all boys born in the 1890 s, specifically those aged 1–10 in 1901 and we use the same mapping of occupational codes of the heads of their households into the social classification. As Table 3 shows, relatively few of our servicemen grew up in households headed by professionals and, as noted in Table 1, only 13.5% were from white-collar backgrounds (social classes 1 and 2). This compares with 18.7% among the household heads of all boys aged 1–10 in 1901. However, as previously mentioned, our sample excludes officers, who were almost entirely from upper- and middle-class backgrounds. If we suppose that 5% of army recruits were officers and that they were all from middle- or upper-class backgrounds, then we would need to adjust the share of those with white-collar backgrounds among our servicemen upwards by about 4.3% points. This would suggest that around 17.8% of *all* enlistments would be from middle-class backgrounds, which is closer to the percentage in the population. If the other shares are scaled down accordingly, with the exception of those from households where the head declared no occupation, the proportions overall are similar to those

[16] We use this as the endpoint to allow for the fact that a few combat-related deaths occurred after the armistice. With the exception of a few key workers, such as coal miners, most serving soldiers were not demobilised until 1919 or 1920. Among the servicemen in our data who were still present at the end of 1918, over 90% were demobilized during 1919. The process of demobilisation is discussed by Crozier (1919) and Graubard (1947).

[17] The Territorial Force was formed in the Haldane reform of 1908 in order to provide a volunteer reserve and most were attached to a regiment of the regular army. Although territorials had no foreign service obligation most territorial units volunteered for foreign service in the first few months of the war. 25 territorial divisions served overseas and many individuals were transferred into the regulars. Recruitment via the territorials came to an end with the introduction of conscription in 1916 (Simkins, 1988; Mitchinson, 2014).

[18] A full list of infantry regiments, their formation, postings, battle honours and casualties is provided by James (1978).

[19] Bailey et al., (2016, 2018) analyse the determinants of the heights of servicemen in these data.

[20] Medical grades were sometimes further subdivided (e.g. AI,. AIV) and, after a critical review of medical examinations, in November 1917 this system was replaced by one with grades from I to IV (see Winter, 1980, p. 221). Other designations ranged from 'fit' or 'good' to 'fair' and 'poor', particularly early in the war and among those who enlisted in the Territorials. We assign the highest grades as 'A′, 'I′, 'Fit' and 'Good,'

[21] By 31st October 1918 there were 2.5 million men in reserved occupations of whom 614,685 were born in 1890–99 (*General Annual Reports on the British Army*, 1921, p. 11).

Table 3
Social class backgrounds of the servicemen sample and the source population.

	Servicemen sample by social class of household head in 1901		All boys aged 1–10 by social class of household head in 1901	
Social classes	Number	Percentage	Number	Percentage
1: Professional	19	0.8	50,596	1.6
2: Managerial and clerical	306	12.7	534,730	17.1
3: Skilled manual	1067	44.3	1302,182	41.6
4: Semi-skilled manual	511	21.2	683,576	21.9
5: Unskilled manual	420	17.5	512,712	16.4
No occupation	83	3.4	44,454	1.4
Total	2406	100.0	3128,250	100.0

Notes: For the servicemen sample the individual occupations of household heads were first converted into the occupational codes in the I-CeM database and then to the Registrar General's (1927, pp. ciii-cxiv) social classification based on the 1921 census. The number of boys aged 1–10 in England and Wales in 1901 by occupation of household head is calculated from the I-CeM database held at the UK Data Archive (Schurer and Higgs, 2020), to which the 1921 social classification is also applied.

of the population.[22]

There is no evidence, at least not from our sample, that those who enlisted in the ordinary ranks of the army were positively selected by social class. However, there are some caveats. Most importantly, there could be biases in which records survived the fire in 1940, although the composition by region of birth seems to be consistent with the official reports (Appendix 2, Table A2.1). It is also worth remembering that our sample is relatively small and these servicemen, who were born in the 1890s, would not necessarily be representative of recruits at different ages.

5. Enlistment

As illustrated further below, two of the most important variables associated with death or injury are months of potential exposure in army service and enlisting in an infantry regiment. Before proceeding to estimate the probability of being killed or wounded in action among our sample of servicemen (conditional on having enlisted), we first examine the correlates of attestation dates and the probability of joining an infantry regiment, as a function of personal characteristics observed in 1901. If those from middle class families enlisted earlier or joined the infantry, then this would increase their relative risk of being killed or wounded, as suggested by the lost generation literature. Other variables that could potentially affect the date and branch of the army joined include growing up in a one-parent family, the number of siblings and characteristics of the childhood locality.

As noted in previous studies, an important factor in the risk of death or injury is the type of regiment that the serviceman joined on enlistment. Those enlisting in infantry regiments were 6.8 times as likely to be killed in action and 2.4 times as likely to be either killed or wounded as those who did not. Recruits were eligible to join the regular army at the age of 18 and the Territorials at age 17 but were not normally sent to serve in the theatres of war until the age of 19.[23] After the introduction of conscription in March 1916 single men aged 18–40 were liable to be called up and there was little choice about which branch of the army to join. Those enlisting after that date were deemed to have been conscripted, even if they had (or would have) volunteered before being called up. However, only 17% of our sample attested after March 2nd, 1916. In addition to other characteristics, enlisting in the infantry rather than in another branch of the army may depend on proximity to a military establishment. At the outset of the war each of the infantry and cavalry regiments had a "depot", a barracks which was its headquarters and also served as its recruiting base.[24] Growing up near an infantry regimental depot could, through local familiarity or personal contacts, have influenced the recruit either for or against enlisting in the infantry. In order to calculate the individual's proximity to a military base during childhood we geo-located each of the servicemen's childhood home and the distance to the nearest infantry or cavalry depot. We then create a dummy variable = 1 if the serviceman grew up within 5 km of an infantry regiment depot.

Columns (1) and (2) of Table 4 report the determinants of the enlistment dates (in years). Not surprisingly those who were under 18 at the outbreak of war enlisted later, by about six months on average. Proximity to a regimental depot has no effect on the date of enlistment, whether or not other controls are included. It seems that the localised recruitment efforts early in the war did not hasten enlistment in the immediate locality. Column (2) adds personal and local characteristics in 1901. Those who grew up in more middle-class households did not enlist significantly later than those where the head of household was a manual worker. Growing up in a single parent family is not associated with date of enlistment but those with siblings attested earlier—by about two weeks per sibling. Neither is there any evidence that those from agricultural districts were slow to enlist as is sometimes suggested (Pennell, 2012, p. 147).

Columns (3) and (4) of Table 4 report the determinants of enlisting in an infantry regiment. A surprising finding is that proximity to an infantry depot during childhood makes it less likely that the individual

Table 4
Enlistment by date and army branch.

	Enlistment date (years)—OLS		Enlisted in infantry regiment–probit	
	(1)	(2)	(3)	(4)
Aged < 18 at outbreak of war	0.4756***	0.4612***	0.0351	0.0406*
	(0.050)	(0.050)	(0.022)	(0.021)
Infantry regimental depot within 5 km (1901)	-0.0397	-0.0471	-0.0552**	-0.0521**
	(0.063)	(0.065)	(0.022)	(0.022)
Single parent family (1901)		0.0200		-0.0274
		(0.127)		(0.029)
Number of siblings (in 1901)		-0.0347***		0.0108**
		(0.012)		(0.005)
White-collar head of household (1901)		0.1061		-0.0237
		(0.079)		(0.031)
Agricultural county (1901)		0.0052		0.0646
		(0.111)		(0.039)
District infant mortality (%) (1901)		0.0007		0.0015***
		(0.001)		(0.000)
R^2 or pseudo R^2	0.0340	0.0390	0.0028	0.0082
Observations	2406	2406	2406	2406

Notes: Cols. (1) and (2) are OLS regressions; cols. (3) and (4) are marginal probabilities from probit regressions. Standard errors clustered by county of residence in 1901 in parentheses; significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

[22] The adjusted percentages are: skilled 42.1; semi-skilled 20.2; unskilled 16.6.

[23] As some individuals misrepresented their age to recruiting officers we use dates of birth calculated from age recorded in the 1901 census rather than that recorded on the attestation form.

[24] The localisation of regiments, broadly based on counties, was instituted by the Cardwell reforms of 1868–74, in which pre-existing infantry battalions were combined into regiments with a depot and an assigned recruiting area. To improve recruitment, the length of service was reduced, and recruits could serve in a regiment with others from the same locality rather than enlisting for general service under which they could be drafted to any part of the army. The Childers reform of 1881 further standardised and consolidated regimental structures and the Haldane reforms of 1906–1912 restructured army reserve units into battalions of the Special Reserve and the Territorial Force, most of which were linked with regiments of the regular army.

would join the infantry. This could be due to greater knowledge of the risks involved in joining the infantry. There is no evidence that men from middle class backgrounds were more likely to enlist in an infantry regiment than in other branches of the army. Although coming from a white-collar background is unimportant, growing up in a large family and in a location with high infant mortality are positively associated with joining the infantry. To that extent there is some evidence that the infantry recruited those from more deprived backgrounds.

6. Death and wounding in action

We examine the risk of death or injury in action as a function of potential exposure measured as months from the serviceman's date of enlistment, or from the beginning of the war for those already in the service, to the end of the war. Thus, for a soldier enlisting in August 1914, potential exposure is 52 months; for one enlisting in March 1916, it would be 33 months. Marginal probabilities from probit regressions for death or injury in action are presented in Table 5. The dependent variables are dummy variables (= 1) for being killed in action or for being either killed or injured in action (not including death, injury or illness from other causes). In column (1) the highly significant positive coefficient indicates that, in the absence of other controls, the probability of being killed in action increased by 0.0041 with every additional month of exposure. On this estimate, being in the army from the beginning of the war implies a probability of death in action of $52 \times 0.0041 = 0.21$, which is somewhat higher than that implied by the crude calculation in Fig. 4 (0.15). From column (2) the unconditional probability of being either killed or injured in action increased by 0.91% with every additional month of potential exposure. Exposure from the beginning of the war implies a probability of death or injury of $0.0091 \times 52 = 0.47$.

Columns (3) and (4) include childhood circumstances observed in 1901 that could have influenced a serviceman's life chances once in the army. Growing up in a single parent family and the number of siblings both take insignificant coefficients for the risk of either death or injury. But having a father in a white collar occupation is associated with reduced risk, which is consistent with the finding of Kesztenbaum (2018) for French soldiers. That could reflect better pre-existing health or education dominating the possible inoculating effect of growing up in less favourable socioeconomic conditions. Whatever the reason, within the ranks of ordinary soldiers, it runs counter to the 'lost generation' view that those from backgrounds higher up the social scale were more likely to suffer death or injury. Those from predominantly agricultural counties were more likely to become casualties, perhaps due to lower natural immunity or possibly because, unlike those from urban districts, they lacked the support of close-knit comrades (see Costa and Khan, 2007). And the higher the level of infant mortality in the childhood district, the greater the likelihood of death or injury. This may reflect the effect of childhood conditions on the health and physical resilience of the individual as an adult, increasing the risk of death or injury. While some childhood conditions matter to a modest degree, adding these variables makes almost no difference to the coefficients on potential exposure.

Table 6 provides separate estimates for those who enlisted in infantry regiments and for those who entered other branches of the army. The upper panel reports the coefficient on potential war exposure with no other controls. Not surprisingly, for the servicemen who initially enlisted in infantry regiments, the coefficients on potential war exposure are larger than those for other servicemen. This is consistent with the higher mortality among infantrymen found by Fornasin et al. (2019), Guillot and Parent (2018), Kesztenbaum (2018) and McCalman et al. (2019). Exposure from the beginning of the war implies a probability of being killed in action of $0.0051 \times 52 = 0.26$ and a probability of being either killed or injured in action of $0.0092 \times 52 = 0.48$. Because soldiers not in the infantry were less often directly in the line of fire there is a sharper contrast between probability of death than in the risk of injury. The regressions reported in the lower panel of the table include three variables that were significant in Table 5. The coefficients on potential war exposure are little altered. The main difference in the other covariates is that having grown up in a white-collar household is more important for avoiding death in the infantry than in other branches of the service where the risks were much lower and where the imperative for self-preservation was less prescient.[25]

Table 5
Potential war exposure and death or injury in action.

	(1) Killed in action	(2) Killed or wounded in action	(3) Killed in action	(4) Killed or wounded in action
Potential war exposure (months of war)	0.0041*** (0.001)	0.0091*** (0.001)	0.0040*** (0.001)	0.0089*** (0.001)
Single parent family (1901)			-0.0023 (0.004)	0.0030 (0.005)
Number of siblings (in 1901)			-0.0114 (0.023)	-0.0135 (0.030)
White-collar head of household (1901)			-0.0482*** (0.015)	-0.0726** (0.030)
Agricultural county (1901)			0.0518** (0.021)	0.1338*** (0.039)
District infant mortality (%) (1901)			0.0008** (0.000)	0.0011*** (0.000)
Pseudo R^2	0.0171	0.0253	0.0247	0.0322
Observations	2406	2406	2406	2406

Notes: Marginal probabilities from probit regressions with standard errors clustered by county of residence in 1901 in parentheses; significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 6
War exposure in the infantry and in other branches of the army.

	(1) Infantry regiment	(2)	(3) Other regiment	(4)
No controls	Killed in action	Killed or wounded in action	Killed in action	Killed or wounded in action
Potential war exposure (months of war)	0.0051*** (0.001)	0.0092*** (0.002)	0.0009** (0.000)	0.0058*** (0.001)
Pseudo R^2	0.0126	0.0229	0.0088	0.0179
With controls				
Potential war exposure (months of war)	0.0051*** (0.001)	0.0090*** (0.002)	0.0008** (0.000)	0.0057*** (0.001)
White-collar head of household (1901)	-0.0739*** (0.027)	-0.0980** (0.044)	-0.0147 (0.010)	-0.0365 (0.028)
Agricultural county (1901)	0.0260 (0.036)	0.1154** (0.049)	0.0533** (0.025)	0.1068** (0.047)
District infant mortality (%) (1901)	0.0006 (0.001)	0.0008* (0.000)	0.0003* (0.000)	0.0005 (0.000)
Pseudo R^2	0.0173	0.0289	0.0278	0.0240
Observations	1234	1234	1172	1172

Notes: Marginal probabilities from probit regressions with standard errors clustered by county of residence in 1901 in parentheses; significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

[25] Those with white collar backgrounds were 12% of infantry and 14% of non-infantry recruits; so the difference in coefficients is not the result severe underrepresentation in non-infantry regiments.

7. Accounting for height and medical grade

Other potential covariates noted above are the serviceman's height on enlistment and the medical grade that was assigned, although the number of observations is reduced. Death or injury could be positively or negatively associated with height. Tall soldiers might be more vulnerable to sniper fire when moving about the trenches,[26] but if height is associated with better health, they might be more likely to survive injury. Kanazawa (2007) found that servicemen who survived in the First World War were an inch taller on average than those who did not. Medical grades assigned to servicemen on joining the army could have been a better measure of health but, as Winter (1980) notes, the medical examinations were often perfunctory and medical grades were not correlated with height. As medical grades were used to determine fitness for service overseas, those allocated higher grades could have been more exposed to the risk of death or injury. In the event, however, many with lower grades were also sent to the front and, if grades were indeed correlated with health, then those with lower grades might be least likely to survive or escape injury.

Table 7 reports the coefficients of probit regressions including height and a dummy variable for the highest medical grades, without other controls (upper panel) and with other controls (lower panel). The coefficients on height are uniformly insignificant and so there is no evidence that taller men were more or less likely to survive. This provides no support for the findings of Kanazawa (2007) and it also contrasts with Fornasin et al. (2019) who found that shorter Italians were more likely to be killed and with McCalman et al. (2019) who found the opposite for Australian servicemen. Even if the dummy for medical grade is omitted, height remains insignificant. The dummy for medical grade A or equivalent takes a significant negative coefficient only for infantry servicemen and only when injury is included. For these soldiers, superior health and fitness seems to have protected them against injury and this outweighed the greater probability of being exposed to enemy fire. However, given the superficiality of the medical examinations, this conclusion can only be tentative. Nevertheless, what evidence we have suggests that, among those who served, the fit and healthy were not more prone to death or injury, which goes against a version of the 'lost generation' view relating to fitness.

Table 7
War exposure, height and medical grade.

	(1) Infantry regiment	(2) Infantry regiment	(3) Other regiment	(4) Other regiment
	Killed in action	Killed or wounded in action	Killed in action	Killed or wounded in action
No additional controls				
Potential war exposure	0.0049***	0.0095***	0.0007*	0.0060***
(months of war)	(0.001)	(0.002)	(0.000)	(0.002)
Height on enlistment	0.0014	0.0007	-0.0018	-0.0056
(inches)	(0.006)	(0.006)	(0.002)	(0.005)
Medical grade A = 1	0.0183	-0.0726**	0.0041	0.0210
(otherwise 0)	(0.027)	(0.035)	(0.009)	(0.031)
Pseudo R^2	0.0148	0.0284	0.0125	0.0228
With additional controls				
Potential war exposure	0.0049***	0.0094***	0.0006	0.0059***
(months of war)	(0.001)	(0.002)	(0.000)	(0.002)
Height on enlistment	0.0030	0.0016	-0.0011	-0.0044
(inches)	(0.006)	(0.006)	(0.002)	(0.005)
Medical grade A = 1	0.0143	-0.0750**	0.0037	0.0200
(otherwise 0)	(0.027)	(0.035)	(0.009)	(0.031)
White-collar head of	-0.0827***	-0.0917*	-0.0119	-0.0299
household (1901)	(0.029)	(0.051)	(0.010)	(0.030)
Agricultural county	0.0050	0.0910*	0.0393*	0.0850*
(1901)	(0.038)	(0.055)	(0.022)	(0.046)
District infant mortality	0.0004	0.0006	0.0003	0.0006
(%) (1901)	(0.001)	(0.001)	(0.000)	(0.000)
Pseudo R^2	0.0203	0.0331	0.0279	0.0268
Observations	1004	1004	1046	1046

Notes: Marginal probabilities from probit regressions with standard errors clustered by county of residence in 1901in parentheses; significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

8. Duration analysis

As potential war exposure is calculated from the month of enlistment to the end of the war, it does not account for the fact that, for various reasons outlined above, some servicemen were discharged before the end of the war. Neither does it account for differences in exposure during phases of the war when military action was more or less intense. To examine exposure in more detail we turn to survival analysis. For the alternatives of killed in action versus survival, exposure ends in death or is censored either by another cause of exit from the army or by the end of the war. For the alternatives of killed or wounded versus neither of these outcomes, survival ends in the month that the servicemen was first recorded as having been wounded or killed if not previously wounded and is censored by other exit from the army or by the end of the war.

Fig. 5 presents Kaplan-Meier estimates for survival. The right-hand panel shows that survival rates are very high in the first six months of exposure, which corresponds with the normal period of training. For those enlisting in the infantry at the beginning of the war, who did not otherwise leave the army before the end of the war, the survival rate is 0.71, so the probability of being killed in action is 0.29. Similarly, the probability of avoiding death or injury in action is 0.36, so the probability of being either killed or wounded over the duration is 0.64. For those who enlisted in other branches of the army and served continuously from the beginning of the war the probability of survival is 0.95 and the probability of avoiding death or injury is 0.68. Not surprisingly these rates of death and injury are higher than those estimated from the coefficients in Table 6 because they take account of the reduced exposure among servicemen who, for various reasons, left army service before the end of the war.

We estimate proportional hazards using the Weibull distribution in order to allow the hazard rate to vary with exposure.[27] As in Table 6, we include white-collar background, agricultural county and district infant mortality, but we also include the death rate for other ranks that is displayed in Fig. 3 in order to account for different phases of the war. This is linked to the hazard rate by calendar month rather than by exposure month. Table 8 presents the estimated hazard ratios. The value of the estimated shape parameter exceeds one in all cases, which indicates that the hazard of death or injury increases with exposure. This is consistent with the shape of the Kaplan-Meier survival curves in Fig. 5 and, particularly for the infantry, it largely reflects the interval between enlisting and being posted overseas.

Not surprisingly the most influential variable is the monthly variation in the total death rate among ordinary soldiers. This is positively and significantly associated with the timing of individual death and injury, even for those not enlisting in the infantry. Although the hazard ratios are of similar orders of magnitude for infantry and non-infantry recruits, the baseline hazard is much lower for the latter. The hazard ratios for having grown up in a white-collar household are less than one, consistent with results in Tables 5 and 6 although they are only significant at 5% for those enlisting in the infantry (column 3). Similarly, having grown up in an agricultural district is associated with relative

[26] One example is William G. C. Gladstone, grandson of the former Prime Minister and a second lieutenant in the Royal Welch Fusiliers, who was tall but refused to crouch in the trenches, died with a head wound from sniper fire in April 1915 (Pound, 1964, p. 126).

[27] The proportional hazards assumption is not rejected in a test using Cox regressions.

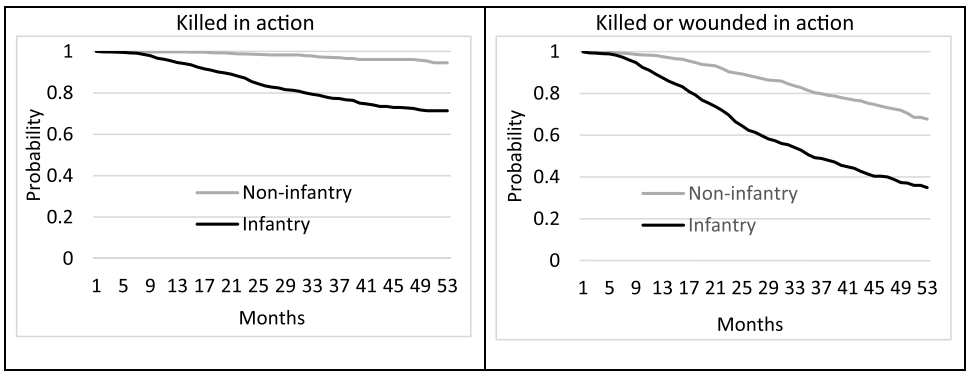

Fig. 5. Kaplan-Meier survival curves
Source: Author calculations—see text.

Table 8
Weibull survival estimates.

	(1)	(2)	(3)	(4)
	Killed in action		Killed or wounded in action	
	Infantry	Other regiments	Infantry	Other regiments
White-collar head of household (1901)	0.6452**	0.5686	0.7197**	0.8447
	(0.135)	(0.342)	(0.093)	(0.167)
Agricultural district (1901)	1.1106	2.9444**	1.3747**	1.5755**
	(0.239)	(1.489)	(0.192)	(0.320)
District infant mortality (%) (1901)	1.0035	1.0101	1.0032*	1.0022
	(0.003)	(0.007)	(0.002)	(0.003)
Total death rate (other ranks)	1.3233***	1.2521***	1.2491***	1.1875***
	(0.027)	(0.083)	(0.018)	(0.032)
Shape parameter	1.5594	2.1448	1.6824	2.0151
	(0.090)	(0.320)	(0.060)	(0.116)
Servicemen	1234	1172	1234	1172
Months at risk	42,059	44,585	35,542	41,411

Notes: Coefficients are estimated hazard ratios for survival using the Weibull distribution. Standard errors in parentheses; significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

hazards larger than one, which are significant except for death in action among infantry recruits. The infant mortality rate prevailing during the individual's childhood also gives hazard ratios exceeding one but is never significant at the conventional level. Overall, the results suggest that, even controlling for the duration of service and for the timing of overall death rates, there is little evidence that those that suffered death or injury were positively selected by socioeconomic background.

In this analysis, no distinction is made between censoring due to the two alternative types of exit from the army: demobilisation at the end of the war and departure from the army sometime before the armistice. In Appendix 3, Table A3.2 we show that the results of treating exit from the army before the end of the war as a competing risk differ very little from those of the single risk model.

9. Conclusions

The First World War is seen as an epic tragedy both because of the large numbers who died or were injured, and especially because it decimated the nation's youth. But the idea of a 'lost generation' that has appeared in many accounts, most notably that of Pound (1964), focuses on the loss of the nation's future leaders, specifically those from upper middle-class backgrounds educated at public schools who served as junior officers. While the selectivity of death between junior officers and the men that they commanded is well known, there has been little discussion of the selectivity within the ranks of ordinary soldiers who made up 95% of the army. In this paper we have examined the correlates of death and injury in action within the ordinary ranks.

If those who enlisted earlier and/or joined an infantry regiment were from backgrounds higher up the social scale than those who enlisted later and/or not in the infantry, then the positive 'lost generation' selectivity would apply also to the ordinary ranks who formed 95% of the army. We find no evidence for this. Servicemen who grew up in white-collar headed households did not enlist any earlier than those from more modest backgrounds. Neither did those who enlisted in the infantry come from more privileged backgrounds than those who joined other branches of the army. Nor were the servicemen in our sample positively selected into the army by social class from among the relevant age group in the population at large.

Some of our key findings are intuitive: these are that the probability of becoming a casualty depended on how early in the war the serviceman enlisted and whether or not he joined an infantry regiment. They cast new light, however, on the differential risks involved. Among our sample of army servicemen born in the 1890s 13.1% were killed in action and another 23.5 were wounded at least once. But we estimate that, for a soldier who enlisted in the infantry at the beginning of the war and who did not leave the army for other reasons before its end, the probability of being killed in action was 29% and the probability of being either killed or wounded in action was 64%.

Once having joined the army, soldiers could have faced different risks that were correlated with their socioeconomic backgrounds, and which might dominate any selection effects of enlistment date and regimental attachment. We find that, conditional on potential exposure, those who grew up in white-collar headed households were less likely to become casualties, particularly among those who enlisted in the infantry. Those from agricultural counties and from unhealthy districts were, if anything, more likely to become casualties in whichever branch of the army they served. And although we might expect that those who were fitter and stronger when they joined the army might have been deployed into the most demanding and dangerous roles, we find no support for this. We conclude that, while 'lost generation' selectivity evidently applies when comparing officers with other ranks, it holds no credence within the ranks of ordinary soldiers.

Author statement

The authors have shared equally in the creation of the database, analysis of the data and writing the paper.

Data Availability

Data will be made available on request.

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Declarations of interest

none.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.ehb.2022.101216.

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