Shorter Article

Morts Pour la France: A database of French fatalities of the Great War☆

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ABSTRACT

This article describes the construction and content of the *Morts pour la France* database. This database contains individual-level data on the universe of the 1.3 million French fatalities of the Great War who were officially recognized as war victims. It provides information on each soldier's first and last names, dates of birth and death, circumstances of death, recruitment status, military rank and unit, and locations of birth and recruitment. We further provide datasets of military death rates at the level of 87 départements and 35 thousand municipalities along with relevant shapefiles and discuss potential applications of this database.

1. Introduction

World War I was a watershed moment for French society. Over four years of battle, 8.3 million French men served in the army and 1.3 million among them died in combat, representing close to 16 percent of the male population of conscripts (Prost, 2008). The imprint of the conflict on France's demography was profound. The war depleted several cohorts of young men and cut a lasting gash in the French population pyramid (Héran, 2014; Bellis et al., 2022). Fertility plummeted and its modest post-war uptick hardly replaced the million "missing" children that were never born (Rohrbasser, 2014). The gender imbalance resulting from the war disrupted marriage markets (Abramitzky et al., 2011) with dramatic implications on the economy writ large, as an entire generation of war widows and single women was drawn into the labor force (Boehnke and Gay, 2022). This labor supply shock perpetuated across generations until today (Gay, 2023). Politically, the Great War may have set the seeds of France's rapid defeat to Germany in 1940 (Bloch, 1946) and some its features help explain collaboration with Nazi Germany upon Philippe Pétain's accession to power (Cagé et al., 2023).

This article describes a novel database that will help improve our understanding of the demographic, economic, and political consequences the Great War on French society: the *Morts pour la France* (MPF) database ("Dead for France"). The MPF database includes a host of individual-level information for each of the 1.3 million French individuals who died as a result of the war: their first and last names, dates of birth and death, circumstances of death, recruitment status, military rank and unit at the time of death,

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and locations of birth and recruitment. In particular, location information in the MPF database is available at the municipality level, France's most disaggregated administrative unit.

The unprecedented granularity of the MPF database opens several avenues for research into the characteristics and consequences of the conflict. In particular, we provide a dataset of military death rates at the level of 35 thousand municipalities, which dramatically improves upon the sources of geographic variation that have been used to identify the consequences of the war. Up to now, researchers had nearly exclusively relied on subsamples of the underlying MPF data aggregated at the level of 87 départements or 21 military regions (Gilles, 2010; Abramitzky et al., 2011; Gilles et al., 2014; Beau, 2017; Guironnet and Parent, 2019; Boehnke and Gay, 2022; Gay, 2023).[1]

The MPF database will also further improve our understanding of battle-specific violence, as it contains information on circumstances and dates of death as well as the military ranks of deceased soldiers. For instance, we document that the deadliest day of French history was September 25, 1915, when 22,059 French soldiers died on the first day of the (ultimately failed) Second Battle of Champagne. Previous historiography instead supported that the deadliest day of the conflict occurred on August 22, 1914, in the context of the Battle of the Frontiers (Steg, 2013) while other advanced instead the Battle of the Marne in early September 1914 as the deadliest day (Guillot and Parent, 2018). The precision and exhaustiveness of our database will also improve our understanding of the sociodemographic consequences of the conflict, which so far have mostly been studied based on subsamples (see footnote 1). As an example, in Section 4, we extend Guillot and Parent's (2018) analysis of the determinants of soldiers' survival duration – based on a sample of 18 thousand deceased soldiers – to the full database. Finally, combined information on soldiers' death and rank will enable economic historians to study organizational aspects of the conflict, in the spirit of Ager et al. (2022), who show how public recognition induced a shift in the mortality profile of German fighter pilots during World War II, or Dippel and Ferrara (2023), who study the effectiveness of military leadership in the context of the US Civil War.

There has been comparable efforts to study the implications of the war using individual-level military fatalities information in other European belligerent countries. In the case of Weimar Germany, De Juan et al. (2023) study the effect of WWI fatalities on the rise of and support for the Nazi Party. They rely on (partly) newly digitized individual-level data on 8.6 million German soldiers who died, were wounded, captured, or went missing during the war.[2] In the case of Italy, Fornasin (2017) uses the *Albo d'oro* register of military deaths to construct estimates of war-related fatalities rates, while Acemoglu et al. (2022) explore the implications of war fatalities on the support for Socialism and Fascism. Finally, in the case of Britain, Carozzi et al. (2023) explore the implications of WWI fatalities on civic capital and combat motivation in WWII.

This article also relates to the literature focusing on the characteristics of WWI servicemen to study the selection effects of mortality among soldiers—see, e.g., Fornasin et al. (2019) on Italian soldiers, Kanazawa (2007) and Bailey et al. (2023) on British soldiers, and McCalman et al. (2019) on Australian soldiers. More broadly, this article relates to the literature that uses individual-level military records to study health, wealth, and migration of historical populations (Costa and Kahn, 2008; Cranfield and Inwood, 2015; Bailey et al., 2016; Costa et al., 2018b,a; Cunningham, 2018; Fourie et al., 2020; Salem, 2023). The largest effort to date in this literature concerns the Union Army during the American Civil War (Fogel et al., 2000; Dippel and Heblich, 2021; Weaver, 2022).[3] Similar data collection efforts are now being undertaken for the Confederate Army (Hall et al., 2019).

In the rest of this article, we first provide some historical context about the organization of the French Army and the archival source of the MPF data (Section 2). We then describe the content of the database (Section 3) and discuss potential uses of the database (Section 4). Finally, we provide technical information on data availability (Section 5). Section 6 concludes.

2. Historical context

This section first discusses the organization of the French Army during the war (Section 2.1) then provides an overview of the construction process of the archival source of the MPF database (Section 2.2).[4]

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[1] Related studies using subsamples of the same data source as that of the MPF database include Rolland (2005) for an analysis of suicides, Le Gall (2013) for the geography of recruitment, Guillot and Parent (2018) for survival rates, Moura (2018) for the characteristics of soldiers who died on battlefields in Meuse and Somme, and Darlu and Chareille (2020) for the disappearance of last names. Vandenbroucke (2014) and Knowles and Vandenbroucke (2019) study the implications of the war on fertility though use a calibration approach based on national-level data.

[2] In a previous effort, Koenig (2023) approximated the constituency-level presence of veterans by the relative growth of the male population to study WWI veterans' support for right-wing parties.

[3] Spanning three decades of data collection effort, the Union Army Data (Fogel et al., 2000) consists in a sample of 40 thousand soldiers – a 1.6 percent random sample of whites mustered into the Union Army – together with additional samples of six thousand Black soldiers, White recruits in six major cities, and prisoners of war who survived until 1900. This database has recently been expanded to the 2.2 million volunteers of the Union Army by Dippel and Heblich (2021) and Weaver (2022). Dippel and Heblich (2021) rely on the *Union Army Registers* reports issued by each US State's Adjutant General's Reports. These reports includes soldiers' full name, enlistment and discharge date, age, military unit, rank, promotion, whether they volunteered, were drafted or commissioned, their State of enlistment, and their status at the end of the war. Weaver (2022) uses an alternative dataset, the American Civil War Research Database.

[4] Appendix Table B.1 provides the list of abbreviations used in this section. The list of laws discussed therein and links to their original texts are provided in Appendix Table B.2. In particular, to support our assertions, we refer to the relevant legislation, which is generally available in the *Journal Officiel de la République, Lois et Décrets*, abbreviated *JOLD*.

2.1. The military in World War I France

The territorial organization of the military at the eve of the war ensured consistency between military command and recruitment.[5] Recruitment was structured into 21 military regions, each further subdivided into eight subdivisions (Figure A.1). In each of these subdivisions of military region, a unique recruitment bureau managed both recruitment and mobilization operations.[6] Regarding military command, each military region was equipped with a unique army corps, which was composed of two infantry battalions, each in turn composed of one artillery and two infantry regiments—one per subdivision of military region. The army further included several cavalry divisions and additional artillery regiments, among which nine regiments of mobile artillery, two regiments of mountain artillery, and some mobile artillery groups.[7]

French men were subject to universal conscription since the Bertreaux Law of March 1905 (Crépin, 2009, 264–329; *JOLD, 37(81), 1869–90*). Moreover, by August 1913 and the *Law of Three Years*, military obligations had increased to 28 years (Boulanger, 2001, 41–56; *JOLD, 46(2), 7138–42*): starting at age 20, conscripts were to serve successively for three years in the active army, for eleven years in the reserve of the active army, for seven years in the territorial army, and for seven years in the reserve of the territorial army. As a result, the active army comprised 817 thousand men of the cohorts 1891–3 upon mobilization on August 2, 1914. Within a fortnight, these troops were supplemented with the 3 million men of the reserve of the active army. An additional 3 million men from the territorial army and its reserve were then gradually incorporated through December 1915, and another 1.2 million in 1916, 1917, and 1918 (Huber, 1931, 88–111).[8] By the end of the war, close to 8 million French men and an additional 500 thousand colonial troops had participated to the conflict.

There were initially relatively few exemptions to universal conscription, as only a few conscripts employed in the military administration were exempted from armed services upon mobilization. However, as the war lingered, the military command soon realized that its plan for supplying troops with weapons and machinery was dramatically insufficient (Porte, 2005; Bostrom, 2016). Indeed, consistent with the cult of the all-out offensive that was then prevalent among belligerent nations (Marril, 2014), the initial plan of military mobilization did not specify an industrial organization that would support a potentially long war.[9] To cope with industrial warfare together with the shortage of civilian labor and the German occupation of the industrial Northeast, the military command soon started to withdraw soldiers with manufacturing skills from the battlefield and allocate them into war factories and mines.[10] As a result, up to 559 thousand soldiers were withdrawn from the front lines over the course of the war, representing close to 12 percent of army personnel. About 300 thousand soldiers were also mobilized in harvesting from 1917 onward.[11]

2.2. The Mort pour la France records

Mort pour la France individual records constitute the underlying source of the MPF database. This archival material was the outcome of a complex process that involved the Mort pour la France recognition and the preparation of the *Livre d'Or* memorial through most of the 1920s.

The Mort pour la France recognition. As early as Winter 1914, the army was facing unprecedented mass mortality (Prost, 2008; Bach, 2010). To foster patriotism and mitigate the risk of demoralization, the government implemented a set of measures to pay tribute to those who had died in its name (Petit, 2016). The idea of a honorary title attributed to fallen soldiers first materialized in December 1914, eventually passing into law in July 1915 (*JOLD, 47(184), 4653–4*).[12]

The Mort pour la France honorary title represented an official recognition that was awarded to all military personnel of the French Army as well as to the French civilians who had died as a result of military operations between August 2, 1914, and October 24, 1919.[13] While its attribution was systematic for those who had died in the line of duty – provided approval of military authorities – it

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[5] The foundations of this organization had been in place since a series of reforms passed in 1873–4 in the aftermath of the Franco-Prussian war (Boulanger 2001, 15–37; Chanet 2006; Gay 2021, 193–5) and in particular the Law relative to the general organization of the army of July 24, 1873 (*JOLD, 5(215), 5281–3*). The specific territorial structure of the military prevalent in August 1914 had been further adjusted by the military laws of September 22, 1913 (*JOLD, 45(261), 8546–7*), December 22, 1913 (*JOLD, 45(349), 11090–1*), and December 31, 1913 (*JOLD, 46(2), 108–9*).

[6] Two exceptions to this territorial organization were the cities of Paris and Lyon, which had their own military government and recruitment bureaus.

[7] The army further included 55 regiments of colonial infantry, seven regiments of colonial artillery, and several regiments of colonial troops. The colonial infantry and artillery had initially been created to defend France's colonial empire and were composed of French men born in mainland France. In contrast, colonial troops were mostly composed of natives of France's colonies (Antier, 2008).

[8] Figure A.2 displays the war exposure of each cohort from the mobilization on August 2, 1914 to the official cessation of hostilities on October 24, 1919.

[9] For instance, the plan of mobilization designed in 1913 only provisioned 50 thousand workers allocated across 30 State factories (Porte, 2005, 26). Likewise, it procured for 14 thousand 75 mm shells per day, although nearly 40 thousand of them were used daily during the Race to the Sea in October 1914. By then, half of the stocks had been depleted (Bostrom, 2016, 264).

[10] This allocation policy was enacted by the Dalbiez Law of August 1915 (*JOLD, 47(223), 5795–7*), which stipulated that "[t]he Ministry of War is authorized to allocate to corporations, factories, and mines working for the national defense men belonging to a mobilized or mobilizable age class, industrial managers, engineers, production managers, foremen, workers, and who will justify to have held their job for at least a year in those corporations, firms and mines, or in comparable corporations, firms, and mines".

[11] Appendix Table B.3 provides a detailed account of the number of mobilized soldiers outside of armed services throughout the war.

[12] The legislative process was initiated by Lower House member Joseph Thierry in December 1914, who proposed to amend the Civil Code regarding death certificates of military personnel (*JOCD doc. parl., 10, 2185*). The bill passed promptly in the Lower House in February 1915 (*JOCD, 11, 163*) then in the Upper House in April 1915 (*JOS, 11, 159–60*). It was adopted in June 1915 (*JOCD, 11, 829*). For more details, see *BALD (68, 226, footnote 1)*.

[13] The circumstances under which a death qualified for the recognition were later extended by the Law of February 28, 1922 (*JOLD, 54(59), 2450*). The date of October 24, 1919 corresponds to the official date of cessation of hostilities per the Law of October 23, 1919 (*JOLD, 51(289), 11790*).

had to be explicitly requested by the families of civilians or military personnel whose death was not directly attributable to military operations, such as deaths by suicide, disease, or accident. Soldiers executed on grounds of mutiny or treason were denied the recognition. Once approved, this honorary title was transcribed onto the death certificate of the deceased.[14] This inscription on the death certificate had the force of law and, shortly after the war, opened compensation rights to the spouse, children, and ascendants of the deceased.[15] The time interval during which a death opened the right to be awarded the recognition was indefinitely extended by November 1945 beyond the date of cessation of hostilities of October 24, 1919, so that families of those deceased even decades after the war as a result of injuries contracted during the conflict can claim this recognition ex-post, even today.

The Livre d'Or Memorial.   The nation's homage to war victims was structured by the Law of October 25, 1919 (*JOLD*, 51(291), 11910), which stipulated the writing of a *Livre d'Or* (Golden Book) containing the names of all those who had received the Mort pour la France recognition (Chabord, 1973; Richard, 2013).[16] The 120 volumes of the Livre d'Or were to be deposited at the Panthéon in Paris and excerpts sent to all of France's municipalities with the names of the Morts pour la France born or residing therein at mobilization.[17]

Several ministries contributed to the preparation of the Livre d'Or, each enumerating their own Morts pour la France: the ministry of the Navy for maritime armed forces, the ministry of the merchant Navy for merchant navigators, the ministry of the Interior for civilians, and the ministry of Pensions for the Land Army, whose constituents represented the overwhelming majority of Morts pour la France (Chabord, 1973, 80).[18] The office of the civil registry of the ministry of Pensions began its operations in July 1922, once the situation of most missing soldiers had been settled.[19] It sent to all regiment operating bases 12-by-17 centimeter cards of three types: pale-havana cards for those who had been granted the Mort pour la France recognition, green cards for those who were denied the recognition, and white cards for unsettled cases. Regiments then filled these cards using information contained in their own records of deceased soldiers, their *fichier de position* (position file) (Prost, 2008, 49–50). These files were based on soldiers' military service records held by their recruitment bureaus of origin (Kesztenbaum, 2013, 10–7). This process lasted until July 1929. By then, the ministry of Pensions had received 1.5 million cards from regiment operating bases. The ministry of Pensions then sent preliminary lists of Morts pour la France to all municipalities for verification. Four-fifth of them responded with various comments in 1929–30, which enabled the Ministry of Pensions to rectify the content of individual cards (Chabord, 1973, 80).[20]

Despite a colossal enterprise that lasted for nearly a decade and mobilized up to 60 employees of the ministry of Pensions, the multiple requests from the Lower House in the 1930s to print the 120 volumes of the Livre d'Or were denied due to the budget crisis faced by the government (Chabord, 1973, 82–9). The Livre d'Or never saw the light of day.

The Morts pour la France records.   While the Livre d'Or never materialized, its source material – 1.5 million individual cards – was deposited at the Bureau of Archives of Victims of Contemporaneous Conflicts (BAVCC) in Caen.[21] Starting in 1999, these cards were scanned by the BAVCC's Direction of Heritage, Memory, and Archives (DPMA) and made available on the Mémoire des Hommes (MdH) web platform on November 11, 2003 (Lemarchand, 2008; Aufray, 2014).[22]

Morts pour la France records contain the following entries: last name, first name, military rank, army corps, recruitment and regiment identification numbers, class (recruitment cohort), recruitment bureau, date, location and type of death, date and location of birth, and date and location of transcription of death—we display the MPF record of one of the authors' ascendants in Fig. 1. Scanned records made available through the MdH web platform were initially indexed by the BAVCC through five fields: first name, last name, date of birth, département of birth, and country of birth. To gather information on the remaining fields – representing close to 20 million cells – starting in November 2013, the MdH web platform made it possible to annotate Morts pour la France records online (Aufray, 2017). Ten days later, the initiative "1 Jour–1 Poilu" was launched, mobilizing "citizen historians" through social media in order to fulfill this immense task (Gilot et al., 2018).[23] Thanks to the participation of 25 thousand contributors, the indexation of all the fields of the Morts pour la France database was achieved on April 30, 2018 (Gilot, 2020). On January 22, 2019, the resulting annotated database was first made downloadable in csv format on the MdH web platform. Its content is periodically updated with corrections made by online contributors.[24]

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[14] The practicalities of the applications of the law are detailed in the circular of the Ministry of Justice of July 8, 1915 (*GGDO*, 5, 152–8).

[15] Conditions of attribution of these compensation rights are defined by the Law of March 31, 1919, art. 15–6 (*JOLD*, 51(90), 3342–3).

[16] The idea of this memorial was initiated as early as June 1916 by Upper House member Louis Martin. However, the bill was only discussed in May 1918, eventually passing into law in October 1919 after several modifications (*BALD*, 72, 495, footnote 1). For a comparable homage through a Golden Book in Italy, see Fornasin (2017).

[17] Homages to fallen soldiers were pervasive throughout the country, generally emanating from decentralized initiatives. The most iconic initiative was the construction of *Monuments aux Morts* (War Memorials) in almost all of France's municipalities (Prost, 1992; Aubry and de Oliveira, 2014).

[18] See Chabord (1973, 80–9) for details on how ministries other than the ministry of Pensions managed this process.

[19] The precise guidelines of these operations are detailed in the Instruction of January 11, 1922 of the ministry of Pensions.

[20] Annotated lists sent by municipalities to the ministry of Pensions were deposited at the National Archives in 1963. These were digitized in 2008–9 (Richard, 2013, 151–2) and are now available on the website of the National Archives (Richard, 2023 [2010]).

[21] Three types of individual cards are deposited at the BAVCC: the 1.4 million pale-havana cards of the Morts pour la France, among which 2 thousand civilians, the 60 thousand green cards of those who were denied the Mort pour la France recognition, and the 30 thousand white cards of initially unsettled cases (Rolland, 2005, 270).

[22] The original MPF records are available at https://www.memoiredeshommes.sga.defense.gouv.fr/fr/article.php?larub=24&titre=morts-pour-la-france-de-la-premiere-guerre-mondiale (accessed on September 25, 2023).

[23] Primary tools for this mobilization campaign were the Twitter hashtag #1J1P together with its associated account @1J1Poilu and web page http://www.1jour1poilu.com (accessed on September 25, 2023).

[24] These raw data files are available at https://www.memoiredeshommes.sga.defense.gouv.fr/fr/article.php?laref=1380&titre=telechargement (accessed on September 25, 2023).

Fig. 1. Example of a Mort pour la France record.
Notes: Example of the MPF card of Joseph Henri Galinier, 22nd colonial infantry regiment, Mort pour la France on September 23, 1914, in Brienne-le-Château due to war injuries. He was born on November 6, 1881, in Saint-Laurent-de-la-Cabrerisse, in the département of Aude.

Limits of the Mort pour la France records. As rich as the content of the Mort pour la France records may be, the process through which this source was constructed conditions the reality of military fatalities the economic historian can capture.

First, these records remain a byproduct of a broader enterprise devised by the State with two primary objectives: provide a national homage to war victims and budget compensations to their families to be distributed by the ministry of Pensions, as the Mort pour la France recognition opened rights to compensations. An accurate census of deceased soldiers was never an explicit objective and, in fact, has always remained out of reach (Loez, 2008; Prost, 2008). Indeed, these records do not account for soldiers who died outside of the line of duty and whose families did not claim the Mort pour la France recognition. Conversely, they account for some civilian victims, among which some employees of the merchant Navy. This source nevertheless remains the closest to a census of deceased soldiers ever attempted.

Second, these records are subject to potential inaccuracies in their information content. They remain a third-level source: their content is based on soldiers' military service records held by recruitment bureaus, which were initially transcribed onto regiments' position files during the war, then onto Morts pour la France records between 1922 and 1929. Regiments' personnel, generally composed of fresh conscripts, were not necessarily trained for these tasks. Moreover, annotations made by the BAVCC between 1999 and 2003 and by citizen historians between 2013 and 2018 might contain inaccuracies not only due to user error, but also because the Mort pour la France records may sometimes be unreadable, exhibit crossed-off content, or contain multiple information for the same field. And contrary to other comparable crowdsourcing projects, no consensus method was used during the annotation process (see, e.g., Van Galen, 2019). Finally, annotators transcribed the information content of the Mort pour la France records as they appeared. As a result, except for the five fields annotated by the BAVCC, annotations remain unstandardized, heterogeneous, and oftentimes replete with redundant information, making them very challenging to use directly for empirical analysis.

One of our contributions is to process the raw data files available on the MdH web platform and create a curated database with standardized fields and interoperable nomenclatures compatible with, e.g., both historic and contemporaneous geographic information systems (Gay, 2021; IGN, 2015), so that the MPF database we provide is directly amenable to empirical analysis by quantitative historians.

Table 1

Variables in the MPF database (1/2).

Category	Variable	Description	Values
Identifiers	ark	Mémoire des Hommes url	String
	id	Record unique identifier	Numeric
General	mpf	MPF status	See table notes
	gender	Gender	Male (1), Female (2)
	civilian	Civilian status	No (0), Yes (1)
Names	lname	Last name	String
	fname	First name	String
	oname_type	Other name type	See table notes
	oname	Other name	String
Birth date	birth_date_flag	Birth date flag	See table notes
	birth_date	Birth date	Date
	birth_year	Birth year	Numeric
	birth_month	Birth month	Numeric
	birth_day	Birth day	Numeric
Death date	death_date_flag	Death date flag	See table notes
	death_date	Death date	Date
	death_year	Death year	Numeric
	death_month	Death month	Numeric
	death_day	Death day	Numeric
Death type	death_type_flag	Death type flag	See table notes
	death_type	Death type	12 categories
Recruitment class	class_flag	Recruitment class flag	See table notes
	class	Recruitment class	Numeric
	engage	Volunteer status	No (0), Yes (1)
Military rank	rank_flag	Military rank flag	See table notes
	rank_gen	Military rank [general]	See table notes
	rank_det	Military rank [detailed]	52 categories
Military unit	unit_flag	Military unit flag	See table notes
	unit_type_gen	Military unit type [general]	See table notes
	unit_type_det	Military unit type [detailed]	16 categories
	unit_id	Military unit id	Numeric
	unit	Military unit acronym	String
	unit_name	Military unit name	String
	unit_colony	Colonial military unit	Mainland (0), Colonial (1)

Notes: Values for mpf: Non MPF (0), MPF (1), Unsettled (2). Values for oname_type: No other name (1), Ou (2), Alias (3), Dit (4), Née (5), Épouse (6). Values for birth_date_flag: Birth date available (1), Birth day missing (4), Birth month and day missing (7), Birth date entirely missing (8). Values for death_date_flag: Death date available (1), Death day missing (4), Death month and day missing (7), Death date entirely missing (8). Values for death_type_flag: Values for class_flag: Missing (1), Location of death (2), Type of death (3). Class available and in bounds pm 4 years (1), Class missing and inputted from birth year (2), Class out of bound (pm 3 years), inputted from birth year (4), Class missing (5). Values for rank_flag: Rank available (1), Rank missing (2), Civilian (3). Values for rank_gen: Enlisted (2), NCO (3), CO (4), Rank missing (.a), Civilian (.b). Values for unit_flag: Unit available (1), Unit missing (2), Civilian (3). Values for unit_type_gen: Infantry (1), Artillery (2), Engineering (3), Cavalry (4), Other (5), Unit missing (.a), Civilian (.b). The MPF database is available in the Harvard Dataverse at https://doi.org/10.7910/DVN/2APQZ6 (Gay and Grosjean, 2023).

3. A database of French fatalities of the Great War

In this section, we provide an overview of the variables in the MPF database: soldier's first and last name, dates of birth and death, circumstances of death, recruitment class, military rank, military unit, location of birth, and recruitment bureau—see Tables 1 and 2 for a summary of the content of the MPF data files.

Raw data files available on the MdH web platform as of September 2023 contain 1,825,593 observations corresponding to 1,422,003 unique MPF records. Starting from these files, we drop duplicate records and soldiers born outside of mainland France.[25]

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[25] There are close to 400 thousand duplicate records in the raw data files because one additional observation is created whenever a given field on an MPF record contains multiple annotations.

Table 2
Variables in the MPF Database (2/2).

Category	Variable	Description	Values
Birth place	birth_place_flag	Birth place flag	See table notes
	birth_cassini	Birth municipality identifier [Cassini]	Numeric
	birth_insee_2015	Birth municipality identifier [INSEE]	String
	birth_geofla_2015	Birth municipality identifier [GEOFLA]	String
	birth_x_geofla	Birth municipality latitude [GEOFLA]	Numeric
	birth_y_geofla	Birth municipality longitude [GEOFLA]	Numeric
	birth_dep_YYYY	Birth département identifier [INSEE, TRF-GIS]	String
	birth_dep_name_YYYY	Birth département name [INSEE, TRF-GIS]	String
	birth_com_name_YYYY	Birth municipality name [INSEE, TRF-GIS]	String
Recruitment bureau	bureau_flag	Recruitment bureau flag	See table notes
	bureau_id	Recruitment bureau identifier	Numeric
	bureau_name	Recruitment bureau name [TRF-GIS]	String
	bureau_mreg	Recruitment bureau military region identifier [TRF-GIS]	String
	bureau_mreg_name	Recruitment bureau military region name [TRF-GIS]	String
	bureau_mregsub	Recruitment bureau military region-subdivision identifier [TRF-GIS]	String
	bureau_msub	Recruitment bureau military subdivision identifier [TRF-GIS]	String
	bureau_msub_name	Recruitment bureau military subdivision name [TRF-GIS]	String
	bureau_cassini	Recruitment bureau municipality identifier [Cassini]	Numeric
	bureau_insee_2015	Recruitment bureau municipality identifier [INSEE]	String
	bureau_geofla_2015	Recruitment bureau municipality identifier [GEOFLA]	String
	bureau_x_geofla	Recruitment bureau municipality latitude [GEOFLA]	Numeric
	bureau_y_geofla	Recruitment bureau municipality longitude [GEOFLA]	Numeric
	bureau_dep_YYYY	Recruitment bureau département identifier [INSEE, TRF-GIS]	String
	bureau_dep_name_YYYY	Recruitment bureau département name [INSEE, TRF-GIS]	String
	bureau_com_name_YYYY	Recruitment bureau municipality name [INSEE, TRF-GIS]	String

Notes: Values for birth_place_flag: Commune available (1), Commune available, Alsace-Lorraine (2), Département available only (3), Birth place missing (4). Values for bureau_flag: Current recruitment bureau (1), Former recruitment bureau (2), Split recruitment bureau (3), Recruitment bureau département only (4), Recruitment bureau city only (5), Former recruitment bureau, Alsace-Lorraine (6), Recruitment bureau out of France (7). YYYY: information relative to the geographic information systems of 2015 (INSEE, 2015; IGN, 2015), 1911, and 1921 (Gay, 2020a,d, 2021). The MPF database is available in the Harvard Dataverse at https://doi.org/10.7910/DVN/2APQZ6 (Gay and Grosjean, 2023).

The final MPF database contains 1,270,943 records, among which 198 women (mostly nurses and civilians), 1,450 civilian victims, and 53,735 soldiers who were denied the MPF recognition (158 cases are still currently unsettled).[26]

First and last name. The MPF database contains 182,434 unique last names. Their distribution is highly skewed: the most frequent last name, JEAN, counts 5,281 records (0.42 percent of MPF records), while 83,180 last names (45.59 percent of all unique last names) count only one entry.[27] Comparing the distribution of last names in the MPF database to that of all contemporaneous last names reveals that the last names composition of MPFs is representative of the general population (Appendix Table B.6).[28] Likewise, the distribution of first names is highly skewed. Over 227,701 unique first names, the most frequent, JEAN, counts 31,574 records (2.48 percent of MPF records), while 170,535 first names (74.89 percent of all unique first names) count only one entry.[29] Both the last name and first name variables have nearly full coverage as all MPF records have a last name and only 176 have no first name mentioned.[30]

Dates of birth and death. Birth dates have nearly full coverage: 99.70 percent of MFP records have a complete birth date, while 3,679 records (0.29 percent of MPF records) only contain a birth year with no month or day information, and 75 records (0.01 percent of MPF records) have no birth date at all. While the conscription directly concerned the cohorts 1866–1900, birth dates range from 1824 to 1917, though only 3,240 MPFs were born between 1824 and 1865 and 253 between 1901 and 1917 (0.27 percent of MPF records). We display the distribution of birth years among MPFs born between 1866 and 1900 in Fig. 2. The most affected cohorts

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[26] See Guillot and Parent (2021, 2022) for a quantitative study of the profile of soldiers who were denied the Mort pour la France recognition based on MPF records.

[27] Appendix Table B.4 provides the list of the 50 most frequent last names along with their frequencies and Appendix Table B.5 provides the distribution of unique last names.

[28] To construct this comparison, we use a subset of INSEE's (2012) file of last names, which provides the total number of last names among births registered in France over the cohorts 1891–1900. More precisely, in Appendix Table B.6, we compare the 10 most frequent last names in the MPF database among all MPF records and among the MPFs born between 1891 and 1900 to the 10 most frequent last names in INSEE's (2012) database. We find that the ordering of these 10 most frequent last names is almost identical in all three samples. For more details on the representativeness of last names in the MPF database, see Darlu and Chareille (2020, 99–102).

[29] Appendix Table B.7 provides the list of the 50 most frequent first names along with their frequencies and Appendix Table B.8 provides the distribution of unique first names. Because the INSEE's (2012) first names file only contains first names given after 1900, we cannot make a comparison to gauge the representativeness of first names in the MPF database.

[30] MPF records further contain aliases as well as maiden names for women in 5,405 cases (0.43 percent of MPF records). We display their distribution in Appendix Table B.9.
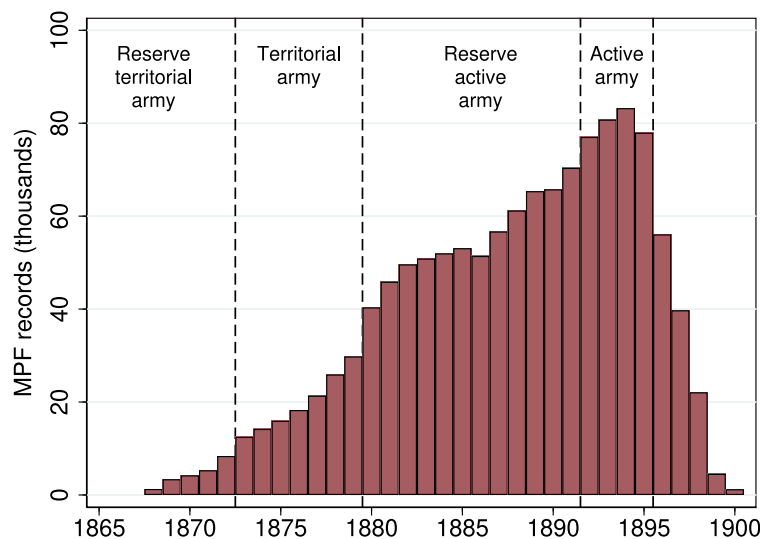
Fig. 2. Distribution of years of birth among MPF records.
Notes: Each bar represents the number of MPF records who were born in a given year. The figure is restricted to the cohorts 1865–1900, which represent 1,267,852 MPF records. It further indicates the armies to which MPF cohorts belonged in 1914 (post-1895 cohorts were drafted after 1914).

were those in the active army (1891–5), who were sent *en masse* to the front lines. In particular, the cohorts 1893–4 each count more than 80 thousand MPFs.

We display the distributions of months and days of birth among MPF records in Appendix Figures A.3 and A.4, respectively. The median MPF was born on February 22, 1889—they would have been 25.5 years old in August 1914. Dates of birth exhibit no cyclical pattern nor any spike in January or on the first day of the month. This contrasts with age heaping often found in censuses and other data from similar time periods—see, e.g., Abramitzky et al. (2021) for age heaping in US census data. A likely explanation is that this information was not provided by soldiers themselves but was based on the information available on soldiers' military service records held by recruitment bureaus, which were filled at the time of recruitment by military officials based on information from civil birth records.

The coverage of death dates is also comprehensive since it is complete for 98.79 percent of records.[31] 12,615 records (0.99 percent of MPF records) only contain the death year with no month or day information, and 2,693 records (0.21 percent of MPF records) have no death date at all. While the official date of cessation of hostilities was October 24, 1919, 3,530 records indicate a death date after that time (0.28 percent of MPF records), as the MPF recognition could be claimed past the end of the war. Moreover, 37,812 records (2.98 percent of MPF records) indicate a death date between the Armistice of November 11, 1918, and the cessation of hostilities of October 24, 1919. The median MPF died on January 20, 1916. We display the distribution of monthly death dates in Appendix Figure A.5.

Circumstances of death. While a field exists to record the circumstances of death in the original MPF records and is filled in most cases with the mention "killed in action" (*tué à l'ennemi*), this field was (the only one) not indexed by the BAVCC on the MdH web platform. However, the field that indicates the location of death sometimes includes information that we can use to infer soldiers' circumstances of death. This field contains heterogeneous information, from the actual location of the death, such as a given battlefield or hospital, to the circumstances of the death, such as a disease or an accident. In nearly half of cases, however, this field is empty in the MdH data files. In these cases, we assume that the soldier was killed in action. From there, we create two variables: one that provides the type of death across 12 categories and one that qualifies this typology, indicating when the circumstance of death was missing in the MdH data file so as to warn users to exert caution when using this variable. Overall, nearly all MPF records indicate a death in action (972,019 records or 76.48 percent of MPF records—and up to 81.27 percent for infantrymen), while the rest generally died in a hospital (14.42 percent) or an ambulance (6.66 percent) (see Appendix Table B.10).

Recruitment class. Soldiers' recruitment class (*classe*) refers to the year in which they were first drafted, i.e., when they first served their compulsory military service. Ever since the Bertreaux Law of 1905, a soldiers' class normally corresponded to the year when he turned 20. In fact, the distribution of recruitment classes mirrors that of birth years plus 20 years (Appendix Figure A.6).

There were three types of exceptions to this enlistment rule (Boulanger, 2002). First, soldiers could voluntarily enlist by anticipation under the status of war volunteer (*engagé volontaire*) as early as 17 years old. Beyond sheer patriotism, early enrollment

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[31] The recorded date of death on MPF records refers to the actual date when the soldier died, not the date when the death was transcribed onto a death certificate. This implies that for soldiers who died of war injuries, the date of death corresponds to the day of death, not the day when injuries occurred.

enabled volunteers to choose their weapon so as to avoid the infantry, which had higher fatality rates than the artillery or the cavalry (Boulanger, 2001, 128–40). MPF records contain information on the volunteer status of deceased soldiers. They reveal that while only 0.2 percent of the 1870–93 cohorts enrolled as volunteers, cohorts that were to be recruited during the war enrolled as volunteers at much higher rates (Appendix Figure A.7): rates of voluntary enrollment increased from 0.4 percent for the 1894 cohort to 2.6 percent for the 1899 cohort. The second exception contended that soldiers could be forcibly enlisted before age 20 through a procedure of recruitment by anticipation. This procedure was pervasive during the war in order to face unprecedented losses. For instance, men of the 1916–7 classes were drafted as early as 1915 (Boulanger, 2001, 57–67). Comparing years of birth to recruitment classes among non-volunteer soldiers reveals that while only 2.3 percent of the 1870–94 cohorts were recruited by anticipation, this proportion was much higher among younger cohorts, reaching 14.5 percent for the 1899 cohort (Appendix Figure A.8). A third and final exception was deferments. Deferments were possible under various conditions: to complete one's studies (e.g., medical training), for fathers of large families, or on grounds of poor health. Nevertheless, the military command granted much fewer exemptions during the war (Boulanger, 2001, 67–75). MPF data reveal that while 1.4 percent of the 1870–94 cohorts were granted deferments, this was only the case for 0.9 percent for the 1895 cohort and 0.03 percent for the 1899 cohort (Appendix Figure A.9).

Information for recruitment class is available for 98.53 percent of MPF records.[32] For 14,093 records, the original recruitment class is more than three years apart from the soldier's birth year plus 20, which is likely erroneous, and for 18,208 records, the recruitment class is missing (1.43 percent of MPF records). In these cases, we impute the recruitment class with the theoretical value of birth year plus 20. Appendix Table B.11 provides a breakdown of these cases, which are flagged in the MPF database.

Military rank (at time of death).   We normalize MPFs' military ranks at time of death into 51 categories so that each category contains at least 10 observations—we classify residual categories into an OTHER category, which contains 53 records. Rank information is missing for 4,506 records (0.35 percent of MPF records), not counting civilians. As shown in Appendix Table B.12, the most frequent rank is SOLDIER with 870,382 records (68.81 percent of MPF records). The second most frequent is CORPORAL with 104,956 records (8.30 percent). 79.32 percent of MPFs are low-ranked enlisted soldiers, 18.91 percent are non-commissioned officers, and 1.76 percent are commissioned officers, including 90 generals.

Military unit (at time of death).   We normalize MPFs' military units at time of death into 250 entities further divided into 16 categories (Appendix Table B.13). The overwhelming majority of MPFs were part of the infantry, with close to 1.1 million records (86.08 percent of MPF records), and generally part of an infantry regiment (64.90 percent).[33] Other units include artillery (6.59 percent), engineering (2.23 percent), cavalry (1.62 percent), and miscellaneous categories (3.48 percent).[34] Despite being born in metropolitan France, nearly 10 percent of MPFs belonged to a colonial military unit (see Footnote 2.1 and the example in Fig. 1). Again, the data coverage for this variable is substantial as only 7,223 records (0.57 percent of MPF records) do not contain information on military unit, not counting civilians.

Location of birth.   Information on MPFs' locations of birth is available in nearly all cases at the level of the municipality (99.33 percent of MPF records), the most granular level of administration—France counted close to 35 thousand municipalities before the war. In 8,400 cases (0.66 percent of MPF records), only the département of birth is provided. The location of birth is missing entirely for only 61 records.

To facilitate usage of this variable for quantitative analysis, we match birth location strings provided in original MPF records to their corresponding Cassini identifiers, which uniquely identify each of the 41,410 municipalities that ever existed between 1801 and 2005 (Motte et al., 2003; Motte and Vouloir, 2007; Gay, 2021).[35] The availability of this unique identifier makes it possible to match MPFs' birth locations to any posterior geographic information system. In particular, we match these locations to the nomenclatures of municipalities as of 1911 and 1921 (Gay, 2020a) as well as to the nomenclature of municipalities as of 2015 (INSEE, 2015), which spatial counterpart corresponds to IGN's (2015) Geofla communes shapefile.

The most frequent municipality of birth is PARIS with 64,988 records (5.15 percent of MPF records), before LYON with 8,851 records (0.70 percent), and MARSEILLE with 8,188 records (0.65 percent). At the other end, 666 municipalities count only one entry (0.05 percent of MPF records).[36] In Appendix Figure A.11, we display the distribution of MPF records across municipalities of birth in 2015 geography.[37]

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[32] By construction, this information is missing for civilians and women.

[33] We also provide the military unit number, which is available for 99.01 percent of MPF records for which the military unit information is available.

[34] Reflecting the evolution of the strategic importance of the infantry relative to the artillery over the course of the war, the share of infantry among MPFs declined from 94 percent in 1914 to 74 percent in 1918 and 54 percent in 1919 (Appendix Figure A.10).

[35] Cassini identifiers are from the *Histoire Administrative des Communes* (HAC) database, initially distributed through http://cassini.ehess.fr, now available as a csv file on EHESS' Didoména repository (Cristofoli et al., 2021).

[36] Appendix Table B.14 provides the list of the 40 most frequent municipalities of birth along with their frequencies and Appendix Table B.15 provides the distribution of unique municipalities. While Paris appears as a single municipality in these tables, MPF information is broken down across Paris' 20 municipal arrondissements in the database.

[37] Close to 4 thousand MPFs were born in Alsace-Lorraine. These numbers are relatively low compared to other municipalities, since those regions were part of German territory in 1914. Still, it is estimated that 18 thousand men from Alsace-Lorraine volunteered for the French Army, including 12 thousand who were already in France at the start of the war and 3 thousand who would have escaped German mobilization (Georges, 2015).

Recruitment bureau. MPF records indicate the name of the recruitment bureau where each soldier was first drafted at age 20. As explained in Section 2.1, each subdivision of military region had one recruitment bureau, i.e., 154 bureaus in total in 1914 (Appendix Figure A.1).[38] However, while 97.23 percent of MPFs were recruited by a bureau that existed in 1914, a few MPFs (7,276 cases or 0.57 percent of MPF records) were recruited by former bureaus that did not exist anymore by 1914. Additionally, while born in France, some MPFs were recruited outside of France (2,240 cases or 0.18 of MPF records). Nevertheless, the availability of this variable is nearly complete as only 1.60 percent of MPF records do not have a recruitment bureau information, not counting civilians.

To facilitate usage of this variable for quantitative analysis, we match MPFs' recruitment bureaus to two types of geographic information. First, we match each recruitment bureau to its corresponding military region and subdivision of military region (Gay, 2020c,d)—as explained in Section 2.1, the geography of military command and recruitment overlapped consistently. Second, we match each recruitment bureau to the nomenclatures of municipalities as of 1911, 1921, and 2015, in the same way as for MPFs' locations of birth (IGN, 2015; INSEE, 2015; Gay, 2020a).

4. Applications

This section provides three examples of how the MPF database might be used for empirical analysis: first, by aggregating MPF records over space to create military death rates and approximate the demographic shock of the war at different geographic levels (Section 4.1), second, by aggregating MPF records over time to shed light on the most deadly battles of the war (Section 4.2), and third, to leverage the individual-level data for an analysis of survival duration during the conflict (Section 4.3).

4.1. Aggregate-level military death rates

An important application of the MPF database is the aggregation of MPF records at various geographic levels to measure the demographic shock of the war. Indeed, the sex ratio among adults aged 15–50 dropped from 98 men per 100 women at the onset of the war to 88 by the end of the war, and it was not until the early 1950s that it reverted back to balance (Appendix Figure A.12).[39] This type of analysis has been done by previous research both at the département (Gilles, 2010; Gilles et al., 2014; Beau, 2017; Guironnet and Parent, 2019; Boehnke and Gay, 2022; Gay, 2023) and at the municipality levels (Cagé et al., 2023). We discuss these applications below and provide some insight on how to properly use these military death rates variables.

4.1.1. Département-level military death rates

We first create a dataset of département-level military death rates by calculating the ratio of MPFs to the size of a département's drafted population during the war, which we approximate by the number of men aged 15–44 in the census of 1911, the last census before the war.[40] We display the distribution of military death rates across départements in Fig. 3. They range from 6.7 percent in Alpes-Maritimes to 29.3 percent in Lozère, with an average of 16.1 percent and standard deviation of 3.8 percent (Panel A of Table 3).[41]

As highlighted in Section 2.1, the systematic part of the distribution of military fatalities was determined by the territorial organization of military recruitment and the industrial war effort. Soldiers recruited in the same military region were initially grouped into the same units and sent to the same battlefields. However, as the war lingered and fatalities accumulated, soldiers were allocated to depleted units depending on the most urgent needs of the military starting in the Fall of 1914, resulting in variation both within and across military regions. Moreover, to cope with industrial warfare, many soldiers from industrial areas were sent to war factories, effectively protecting them from death in the trenches. These patterns are apparent when analyzing the pre-war determinants of military death rates across départements through linear regressions (Appendix Table B.18), as rural départements experienced greater military death rates—rurality explains 75 percent of the variation in military death rates. Other characteristics capturing the pre-war economic structure of départements are not significantly correlated with military death rates and do not explain much more of their variation, as does further including military region fixed effects.[42] For these reasons, we advise potential users of the département-level military death rates data to rely on the residual variation in military death rates once rurality is accounted for.[43]

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[38] This includes the five recruitment bureaus of the military government of Paris, the three of the military government of Lyon, and the recruitment bureau of Versailles, which were not attached to a specific subdivision of military region.

[39] The adult sex ratio was only marginally affected by military fatalities of World War II as 115 thousand French soldiers died over that period, which is an order of magnitude below the fatalities from World War I (Lagrou, 2002).

[40] More precisely, the numerator consists in the sample of non-civilian male MPFs born in mainland France outside of Alsace-Lorraine and who died between August 2, 1914 and October 24, 1919.

[41] Département-level military death rates were previously made available by Boehnke and Gay (2020) using an early version of the MPF database. In Appendix Tables B.16 and B.17, we compare the raw département-level data used in Boehnke and Gay (2022) to those in the current study. Numbers are fairly close and military death rates are on average larger by 0.51 percentage points when using the current updated database. This difference can be explained by the fact that Boehnke and Gay (2022) did not include soldiers who were not awarded the MPF mention, resulting in a sample smaller by about 40 thousand records.

[42] We capture rurality through two aspects: the share of the population that resides in municipalities with fewer than 2,000 inhabitants and the share of the population born in the département. Other characteristics we consider include pre-war female labor force participation rates, the share of girls aged 5–19 in school, total fertility rates, personal wealth (in 10,000 francs), the share of active population in the industrial sector, average height of conscripts, total population, the share of literate population, and average direct taxes per inhabitant. See Boehnke and Gay (2022, 1217–9) and Gay (2023, 2308–9) for more details.

[43] See also Boehnke and Gay (2022, 1225–6) for an instrumental variables approach that exploits discontinuities in the timing of military service across the cohorts 1891–4. It is also worth mentioning that we assign military fatalities to a département through MPFs' départements of birth. However, these might
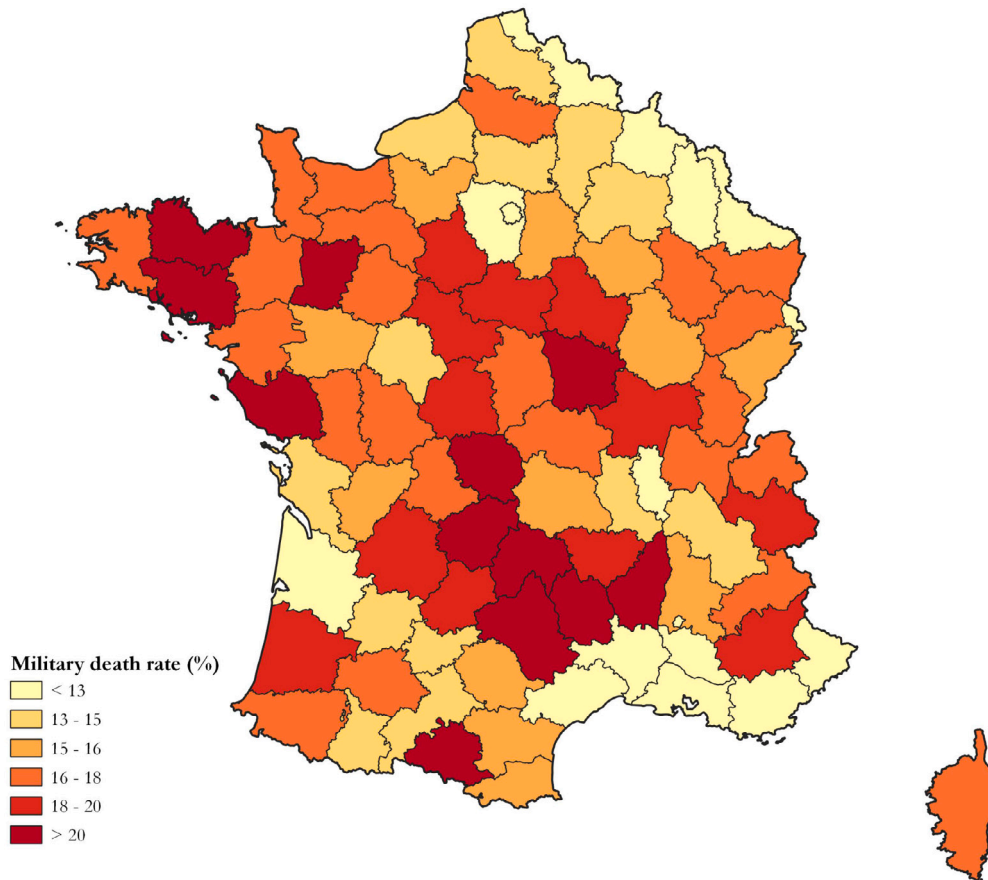
Fig. 3. Military death rates across départements.

Notes: This figure displays the distribution of military death rates across départements. It is the ratio of non-civilian male MPFs who died between August 2, 1914 and October 24, 1919 to the number of men aged 15–44 in the census of 1911. The data are mapped in 1914 geography using the département-level shapefile of Gay (2020b).

4.1.2. Municipality-level military death rates

To analyze the implications of the war at a more disaggregated level, we create a dataset of municipality-level military death rates based on our MPF database. Municipalities are the most disaggregated administrative level in France, as the country counts about 35 thousand municipalities. Unfortunately, the census of 1911 does not provide municipality-level population by age and gender, so we are constrained to rely on total population in the denominator. For consistency, the numerator therefore further includes civilian and female MPFs who were born in mainland France outside of Alsace-Lorraine and died between August 2, 1914, and October 24, 1919. We display the resulting distribution of military death rates in Fig. 4.[44] Among the 34,893 municipalities of France, only 92 had no MPF—99.7 percent of municipalities had at least one military death from the war. These 92 municipalities were relatively small, as 68 of them had less than 100 inhabitants in 1911, and the largest had 227 (Appendix Table B.19). Other municipalities experienced very high death rates, with 11 municipalities experiencing death rates above 15 percent of their population. But again, these municipalities were relatively small as only one among the 50 most affected by the war had more than a thousand inhabitants in 1911 (Appendix Table B.20). Overall, municipality-level death rates have an average of 3.9 percent and standard deviation of 1.6 percent (Panel B of Table 3).[45] Given the modest size of French municipalities, this means that the average municipality lost 36 men during the war.

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have differed from their départements of residence at the onset of the war, as 19 percent of men aged 15–44 resided outside their département of birth in 1911—see Boehnke and Gay (2022, Appendix E) on this potential issue.

[44] Note that we are constrained to map this variable in 2015 geography because municipality-level shapefiles for 1914 do not exist to date. For consistency in the matching process between the pre-war geography and that of 2015, we correct the 1911 population data for municipalities created after the war by attributing the population of their parent municipality in proportion to the population ratio between them and their parent municipality at the time of their creation. We proceed in the same way for the MPF data except that we correct figures for municipalities created after 1891.

[45] Municipality-level death rates were previously made available by Cagé et al. (2023) using an early version of the MPF database. However, they did not correct for changes in municipalities' geographies, so that we advise users to rely on this updated database of municipality-level death rates.

Table 3
MPFs and military death rates.

	Obs.	Mean	S.d.	Min.	Max.
A. Level of aggregation: Départements					
MPFs	87	14,331	10,253	2,574	81,912
Male population 15–44 in 1911	87	100,855	122,464	21,620	1,090,751
Military death rate	87	16.07	3.84	6.69	29.33
B. Level of aggregation: Municipalities					
MPFs	34,893	36	361	0	64,219
Population in 1911	34,893	1,217	31,465	18	5,776,220
Military death rate	34,893	3.94	1.56	0.00	22.50

Notes: This table provides summary statistics for MPFs and military death rates at two levels of aggregation: départements and municipalities. Information for the male population aged 15–44 in 1911 is from the census of 1911. France's territory excludes Alsace-Lorraine and the communes of La Brigue and Tende. MPFs include non-civilian male MPFs born in France outside of Alsace-Lorraine and who died between August 1, 1914 and October 24, 1919.

Data at the municipality level reveal several new facts compared to previous estimates that were only available at the département level. First, one of the most striking features of Fig. 4 is the extent to which municipalities in the regions of Brittany and Vendée were most consistently and hardly hit. Other regions tend to exhibit much more variation in their municipality-level military death rates, for instance the case in Corsica. Meanwhile, other départements with lower average death rates display pockets of very high death rates, for instance in Doubs and Jura, where respectively 6 and 4 of the 50 municipalities with the highest death rates are located (see Appendix Table B.20). In fact, département fixed effects explain little of the variation in military death rates across municipalities, as the residuals from regressing municipality-level military death rates on département fixed effects have a standard deviation of 1.48, relative to 1.56 for the raw death rates variable.

4.2. The deadliest days of the war

A second potential application of the MPF database is in the study of the dynamics of the conflict. For example, Fig. 5 plots the time series of aggregated daily dates of death in order to shed light on the most deadly battles of the war. It reveals that the deadliest day of the conflict was the first day of the Second Battle of Champagne on September 25, 1915, an ultimately failed offensive for the French Army. On that day, 22,059 soldiers died. Many historians assert instead that the date of August 22, 1914, during the Battle of the Frontiers, was the deadliest day of the conflict (see, e.g., Steg 2013). Our data record this day as the second deadliest day of the conflict with 19,964 fatalities.[46]

Overall, the Battle of the Frontiers of 1914 remains a period of very high mortality. Several days of late August 1914 feature among the days with highest total deaths: 9,671 men died on August 20, 1914, 6,233 on August 25, 1914, and 7,370 on August 28, 1914. A few days later during the First Battle of the Marne on September 8, 1914, 6,624 men would die. Another notable day is the first day of the Chemin des Dames offensive on April 16, 1917, when 9,426 men died during another failed French attempt to break through the German lines. This failed offensive led to the onset of massive mutinies in the French Army (Loez and Mariot, 2008).

4.3. An analysis of survival inequalities on the front

A third potential application of the MPF database is in the study of the determinants of soldiers' survival rates during the war, an analysis previously done by Guillot and Parent (2018) on a non-random sample of 18 thousand deceased soldiers – a 1/52nd sample of the MPF database – born during the first seven days of the month of October, regardless of the year. In this section, we reproduce their analysis based on the full MPF database.

We focus on non-civilian male MPFs of the cohorts 1866–94 born in mainland France outside of Alsace-Lorraine who died between August 2, 1914 and November 11, 1918, for whom the death date is available.[47] We define survival duration (in days) as the difference between the date of death and 2 August 1914, the first day of the war—conditional on dying during the war, soldiers survived on average for 528 days. We then estimate through linear regressions the relationship between survival duration and the age of soldiers as of August 2, 1914 (in days), their military unit (where the excluded category is Infantry), their military rank

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[46] Note that the MPF database only includes the subset of colonial troops that were born in mainland France and thus does not count colonial troops born in the colonies. The database also counts men who died of diseases on a given day, but these men may have been injured on another day. It therefore remains to be shown whether these differences would make up for the difference in fatalities between what is commonly accepted as the deadliest day of WWI for the French Army and what the MPF database reveals. Another possibility is that some of the previous quantitative studies of the conflict, e.g., Guillot and Parent (2018), relied on the 1866–94 cohorts that were already drafted at the start of the conflict, excluding the new cohorts that were incorporated as the conflict dragged on. We find that August 22, 1914 was indeed the deadliest day for these cohorts. In any case, this point illustrates the potential uses of the MPF database for the historiography of WWI in France.

[47] This selection is to avoid measurement error due to the fact that we do not know when soldiers first joined the front. From 1,270,943 records, this selection reduces the sample to 976,885 observations.
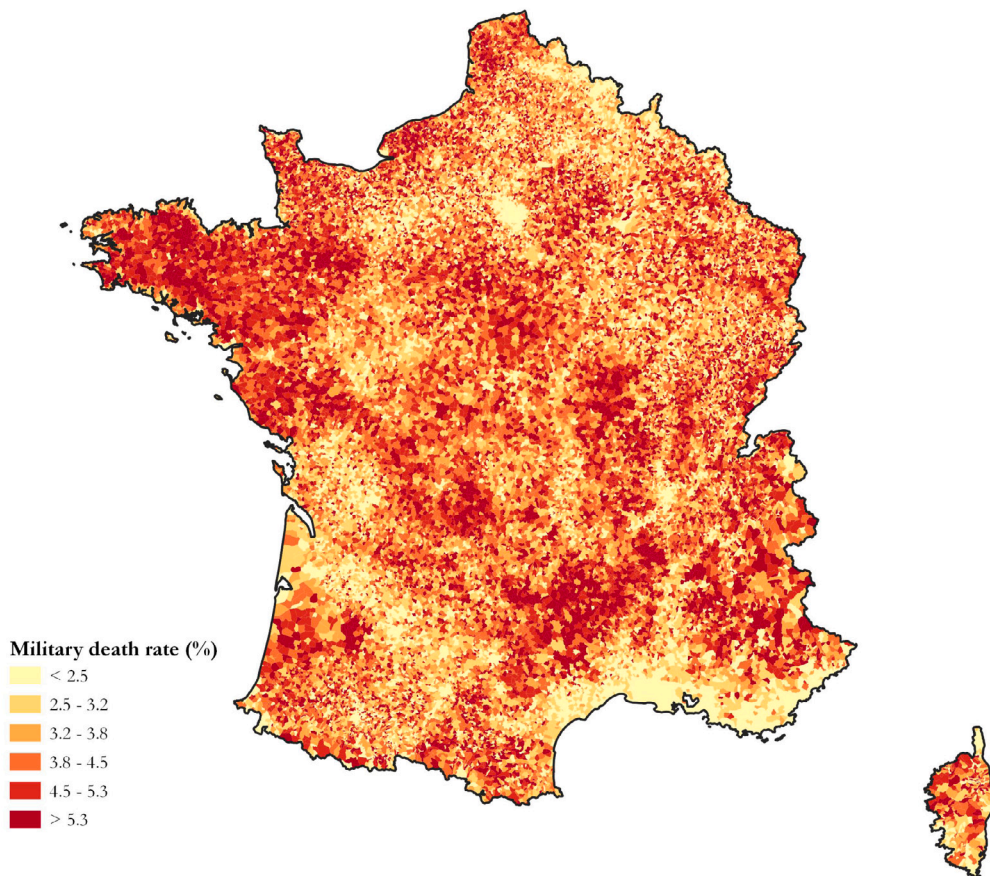
Fig. 4. Military death rates across municipalities.
Notes: This figure displays the distribution of military death rates across municipalities within the boundaries of France as of 1914. It is the ratio of all MPFs who died between August 2, 1914 and October 24, 1919 to the total population in the census of 1911. The data are mapped in 2015 geography using the shapefile of IGN (2015).

(where the excluded category is `Enlisted`), whether they were in a colonial unit, and whether they enrolled voluntarily. We then progressively include a set of fixed effects for soldiers' military region of recruitment, département of birth, and municipality of birth.[48] We report results in Appendix Table B.21.

Soldiers from the infantry had considerably shorter survival times. On average, soldiers in the artillery survived one more year (350 days) compared to infantrymen, while those in engineering corps survived 231 more days, and those in the cavalry, 314 more days. Soldiers in other units, such as train personnel or marines, survived 434 more days. These findings are qualitatively similar to those in Guillot and Parent (2018), although the magnitudes of differences between the infantry and other units are larger when using the full MPF database. Additionally, officers survived longer than enlisted soldiers: 108 days for non-commissioned officers and 134 days for commissioned officers. Younger soldiers died faster: even conditional on rank and unit, (deceased) soldiers a year older could expect to survive 4 more days. Finally, soldiers from colonial units survived longer, though only by about a month, while the (few) volunteers died faster, by about three months. Including fixed effects for soldiers' spatial origins does not significantly alter estimated coefficients.

5. Data availability

The dissemination of MPF records through the MdH web platform was authorized by the decrees of October 3, 2003 and July 24, 2014 (Aufray, 2014).[49] The collection, digitization, indexation, conservation, and online diffusion of the personal data contained

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[48] Selecting on cases for which all these control variables are available further drops close to 23 thousand records, resulting in a sample of 953,382 observations.
[49] The texts of these two decrees are accessible at https://www.legifrance.gouv.fr/eli/arrete/2003/10/3/DEFS0302096A/jo/texte and https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000029361926.
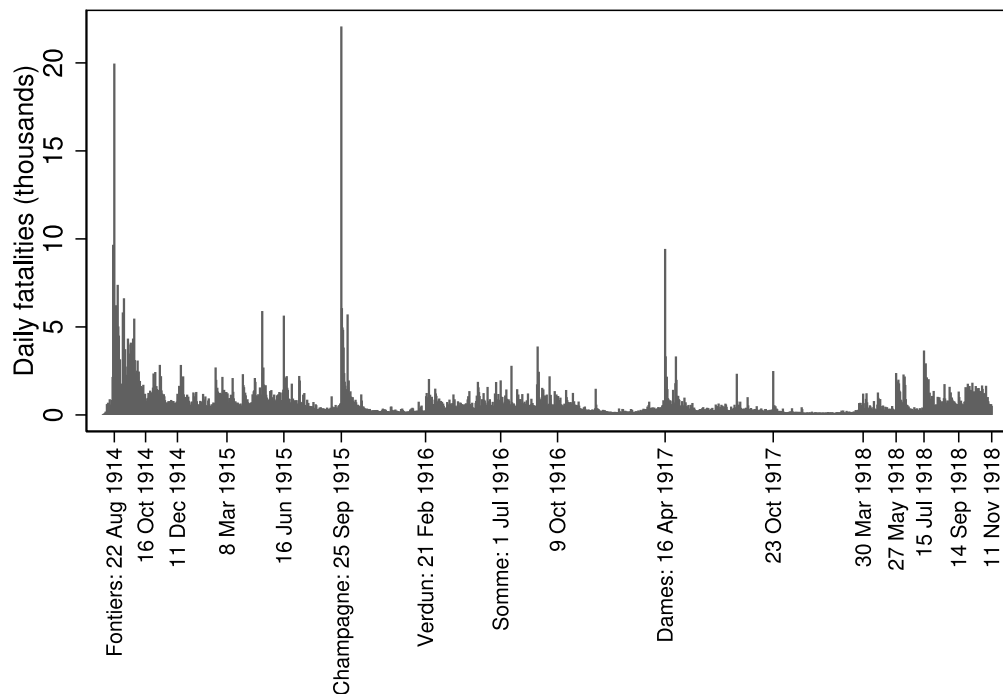
Fig. 5. Daily number of military fatalities.

Notes: This figure displays the number of daily fatalities in the MPF database between August 2, 1914 and November 11, 1918 among non-civilian MPFs born in France and for which the date of death is available (1,213,086 MPFs in total). Some notable, particularly deadly dates are highlighted with accompanying events on the front. Other dates are provided for reference.

in the MPF records was further authorized by the National Commission on Informatics and Liberty (CNIL) on July 10, 2014, for historical, statistical, and scientific purposes.[50]

We disseminate the MPF database under the CC-BY 4.0 license on the Harvard Dataverse at https://doi.org/10.7910/DVN/2APQZ6 in both Stata data format (dta) and text delimited format (txt) under the heading mpf_database (Gay and Grosjean, 2023). We also disseminate two additional datasets discussed in Section 4: the département- and municipality-level military death rates datasets in both Stata data format (dta) and text delimited format (txt) under the headings mpf_deathrate_dep and mpf_deathrate_municip, respectively, together with relevant shapefiles, under the headings DEATHRATE_DEP and DEATHRATE_MUNICIP, respectively (see Table 4 for a summary of the content of these data files).

6. Conclusion

This article describes the *Morts pour la France* (MPF) database. It includes a host of individual-level information for each of the 1.3 million French individuals who died as a result of the war: their first and last names, dates of birth and death, circumstances of death, recruitment status, military rank and unit at death, and locations of birth and recruitment. We also provide datasets of military death rates at the level of 87 départements and 35 thousand municipalities along with relevant shapefiles.

Matching records from the MPF database to auxiliary individual-level information constitutes a promising avenue of research. Given the availability of soldiers' names, dates of birth, and locations of birth and recruitment, it would be possible to match these records to military service records, which include information on height, weight, occupation, and other physiological characteristics as well as migration and military unit histories (Kesztenbaum, 2013). It would also be possible to match these records to the pre-war censuses of 1901, 1906, and 1911 to assess MPFs' family composition and living arrangements.

Data availability

The data described in this article is available at https://doi.org/10.7910/DVN/2APQZ6.

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[50] The text of this deliberation is available at https://www.legifrance.gouv.fr/cnil/id/CNILTEXT000029312428. The MdH web platform specifies that "[t]he public information visible on the Mémoire des Hommes website may be freely reused for purposes other than those of the public service mission for the needs of which the documents were produced or received according to the Etalab 2 open license model". (https://www.memoiredeshommes.sga.defense.gouv.fr/fr/article.php?laref=7, accessed on September 25, 2023).

Table 4
Variables in the military death rates databases.

Dataset	Variable	Description	Values
Département level	dep_1911	Département identifier [TRF-GIS 1911]	String
	dep_name_1911	Département name [TRF-GIS 1911]	String
	mpf	Number of non-civilian male MPFs	Numeric
	pop_m_15t44	Male population 15–44 in 1911	Numeric
	deathrate	Military death rate (%) [MPF/male population 15–44 in 1911]	Numeric
Municipality level	dep_2015	Département identifier [INSEE 2015]	String
	dep_name_2015	Département name [INSEE 2015]	String
	geofla_2015	Municipality identifier [GEOFLA 2015]	String
	insee_2015	Municipality identifier [INSEE 2015]	String
	com_name_2015	Municipality name [INSEE 2015]	String
	mpf	Number of non-civilian MPFs	Numeric
	pop_1911	Municipality population in 1911 in 2015 geography	Numeric
	deathrate	Military death rate (%) [MPF/population in 1911]	Numeric

Notes: The military death rates databases are available in the Harvard Dataverse at https://doi.org/10.7910/DVN/2APQZ6 (Gay and Grosjean, 2023).

Appendix A. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.eeh.2023.101550.

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