

# Scars of War: the Legacy of WWI Deaths on Civic Capital and Combat Motivation

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# Soldier motivation in battle



Donald S. Bell

*During an attack, heavy fire opened on the attacking company by a hostile machine gun. Bell, on his own initiative, crept up a communication trench and attacked the machine gun. This very brave act saved many lives and ensured the success of the attack. (The London Gazette, 1916)*

**What motivates soldiers to risk their lives in battle?**

# Drivers of combat motivation

1. Close comrades-in-arms – parochial altruism

Shils and Janowitz 1948, Costa and Kahn 2003

2. For the cause – identity/reciprocity

Barber IV and Miller 2019, Caprettini and Voth 2022

3. For honour and glory – social/self image

Ager, Bursztyn, Leucht, and Voth 2022

4. State repression

Rozenas, Talibova and Zhukov 2022

5. Direct parent-child transmission

Campante and Yanagizawa-Drott 2016

# Past sacrifice and remembrance



**Research question:** Do past acts of sacrifice and their remembrance influence soldiers' behaviour?

## Main empirical questions

- 1: Do WW1 deaths affect WW2 deaths at the community level?
- 2: What are the **mechanisms**?

WW1 deaths  $\xrightarrow{\text{civic capital}}$  WW2 outcomes

## Empirical strategy

- Collect new individual and micro data for Britain, WW1 and WW2.
  - Mobilisation, soldier mortality, medals, memorials.
- Use variation in number of WW1 deaths across 14,000 UK parishes to study effects on behaviour of soldiers in WW2.

# Background

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# The UK army in the World Wars

## WW1

- Until 1914: Small professional force of 250k.
- 1914: Kitchener's call to arms, 750k volunteer
- 1916: Military Service Act introduces **conscription**.
- 6M+ served during WW1.  $\approx$  700K deaths.



## WW2

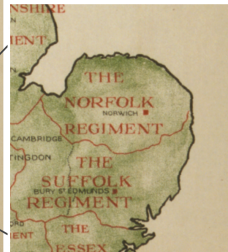
- 1939: Small army of 200k.
- Sept. 1939: National Service Act introduces **conscription**.
- 2.9M served during WW2.  $\approx$  380K deaths (+70K civilians).

## Army structure – regiments

- Army divided into **regiments**, often with county or regional affiliations.
  - Northumberland Fusiliers
  - Norfolk Regiment
  - Durham Light Infantry Regiment
  - Welsh guards
  - ...
- Before conscription began (1916), soldiers usually enlist in local regiment.



# Regional regiments “recruitment areas” ▶ IV



# Army structure – battalions

- Each regiment is divided in several **battalions** of roughly 1,000 soldiers: 1<sup>st</sup> battalion, 2<sup>nd</sup> battalion, etc.



Norfolk regiment's 8<sup>th</sup> battalion's pack mules.

# Data

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## War records WW1

- About 4M Army Records, incomplete (“burnt” documents).
  - Crucial to construct **mobilisation** figures

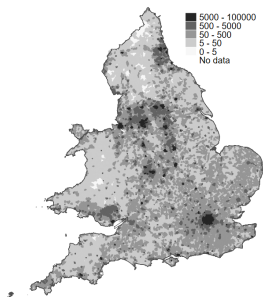
## WW1 and WW2 dead soldiers

- All deaths in both wars from Commonwealth War Graves Commission (CWGC).
  - Names, rank, regiment, **honours received, birthplace.**

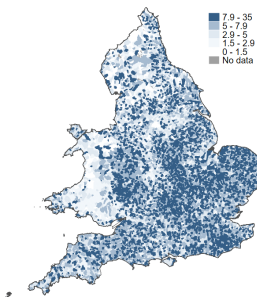
## Other data

- Geolocalized WW1 memorials, veterans’ associations, charities.
- 1911 UK individual-level Census.

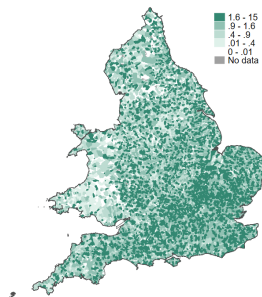
# Spatial variation – parishes



Pop. Density 1911



WW1 Mobilisation p.c.

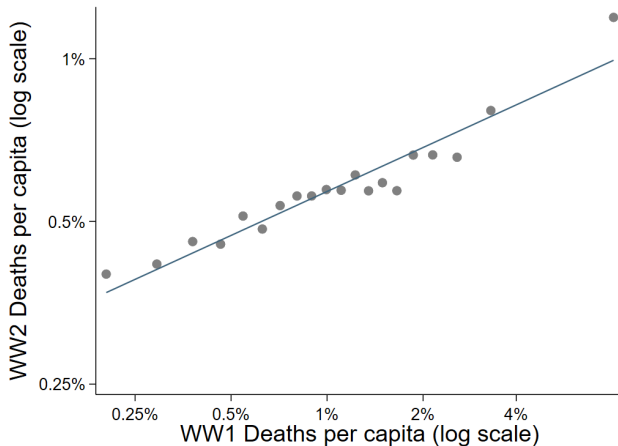


WW1 Deaths p.c.

# Empirical analysis

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## Stylized fact: WW1 and WW2 deaths correlate



## Specification: WW1 and WW2 Deaths

$$\text{Log}(d_i^{\text{WW2}}) = \beta \text{Log}(d_i^{\text{WW1}}) + \gamma'X_i + \eta_j + \varepsilon_i$$

where

- $d_i^{\text{WW2}}$  – Number of dead in WW2 from parish  $i$ .
- $X_i$  – includes (log) population and mobilization. [► List](#)

### Source of bias (OLS)

- Parish-level characteristics affecting soldiers' behaviour.
- Selection of soldiers into fighting units.

**Solution:** Instrument  $d_i^{\text{WW1}}$



## IV strategy: instrument

Instrument *actual* WWI deaths in parish

$$d_i^{WW1} = m_i \sum_{j=1}^J \alpha_{ij} \delta_j + m_i \sum_{j=1}^J \alpha_{ij} \xi_{ij},$$

with *predicted* deaths from battalion-level mortality:

$$z_i = m_i \sum_{j=1}^J \alpha_{ij} \delta_j$$

where  $m_i$  is mobilised soldiers from parish  $i$ ,  $\delta_j$  is battalion  $j$ 's death rate (leave-out estimate).

## IV strategy: instrument

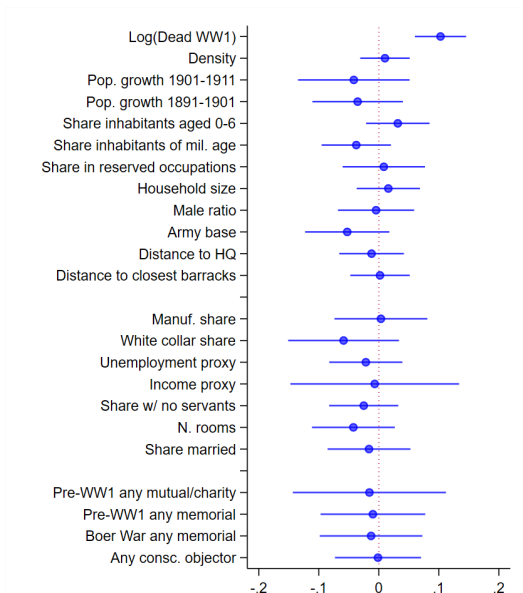
- Our instrument has a **shift-share** form:

$$z_i = m_i \sum_{j=1}^J \underbrace{\alpha_{ij}}_{\text{shares}} \underbrace{\delta_j}_{\text{shocks}}$$

### Identifying assumption

- Battalion mortality rates  $\delta_j$  uncorrelated with parish-level determinants of enlisting/mortality.
  - Enough to assume **shocks** are exogenous (Borusyak, Hull and Jaravel 2022).

# Instrument exogeneity I: balancing checks



Note: univariate regressions of  $z$  on std. covariates.

## Instrument exogeneity II: controlling for regiment

- Recruits can self-select or be allocated to units endogenously.
  - For ex: soldier can influence **regiment** choice
- But assignment to **battalions** was more exogenous:

► Recruitment

► Battalions

*“The 2nd battalion should be [formed] as soon as 100 recruits are allotted to the 1st ... succeeding drafts to each unit in approx. equal numbers”* (Circular from Adjutant-General, 1914)

**Solution:** Use variation in mortality *within* regiment across battalions.

## IV results – Effect of WWI deaths on WW2 deaths

	OLS	IV	
	$\text{Log}(d^{WW2})$	$\text{Log}(d^{WW2})$	$\text{Log}(d^{WW2})$
$\text{Log}(d^{WW1})$	0.182*** (0.017)	0.492*** (0.142)	0.447** (0.190)
First stage F-stat		56.6	21.1
Obs.	6305	5434	5346
IV Variation		All	Within Regiment

1% more deaths in WW1 → 0.2-0.5% more deaths in WW2.

# The effect of WW1 deaths on WW2 behaviour

## Main result

- Communities with high WW1 deaths also have high WW2 deaths
  - Not due to parish-level persistent factors
  - Not due to selection into riskier regiments.

## Why?

- Hypothesis: ↑ willingness to incur private costs for social gain
- To investigate examine WW2 **honours received** at **soldier level**:
  - Full records on the 2.9M men *served* in WW2 closed.
  - we use those *killed*; about 3% awarded honours.

# WW2 gallantry honours



Victoria Cross



DSO



Mentioned in disp.

- Use award of medals as **outcome** in a soldier-level regression.
- Caveat: only data on dead – variation in courage, conditional on being killed.

## Effect of WW1 Deaths on WW2 Honours

**Linear prob. model:**  $Honour_s = \alpha + \beta \text{Log}(d_i^{WW1}) + \gamma'X_s + FE$

	(1)	(2)	(3)	(4)
$\text{Log}(d^{WW1})$	0.004*** (0.001)	0.005*** (0.001)	0.004*** (0.001)	0.002*** (0.001)
Mean of dep.var.	0.032	0.032	0.032	0.032
Obs.	218912	204798	204786	204786
Age FE	N	Y	Y	Y
Rank FE	N	N	N	Y
Regiment FE	N	N	Y	Y

Notes: Soldier-level regressions

1% more deaths in WW1  $\rightarrow$  .12% higher Pr(Honours) in WW2.



## **Mechanisms: WW1 deaths and civic capital**

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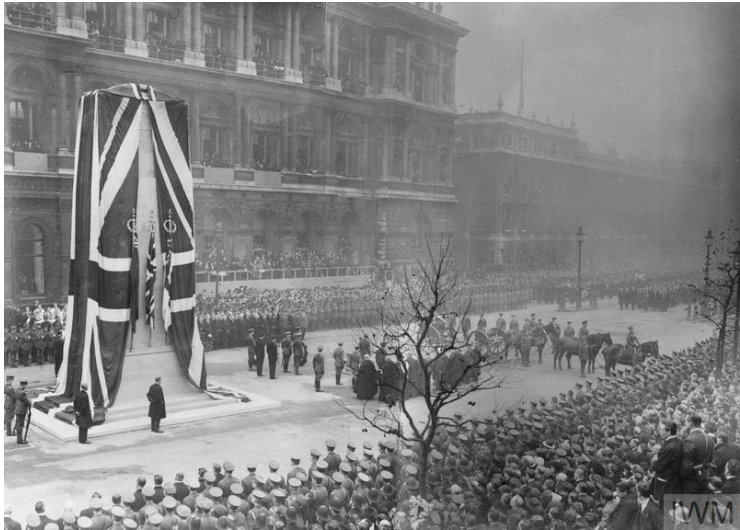
## Civic capital

*“Those shared values and beliefs that help a group overcome the free rider problem in the pursuit of socially valuable activities” (Guiso, Sapienza and Zingales 2011).*

## Commemoration of WW1 in Britain

- Construction of over 50,000 **War memorials**
- Remembrance day on Nov. 11 every year
- Festivals, parades, red poppy.

# The Cenotaph on Remembrance Day, 1920 (Nov. 11)



# Memory of the dead and civic capital

## Hypothesis

Cultural transmission of civic capital connected the behaviour of soldiers in the two wars.

## Empirical tests

- **Test 1:** Response in civic capital during inter-war period.
- **Test 2:** Mediation analysis (*in paper*).

## Measuring civic capital

1. *Listed WW1 Memorials*
2. Branches of the British Legion
3. Presence of Mutuals/Charities.

## IV results – Effect of WW1 deaths on civic capital

	(1) Memorials	(2) Charities	(3) Legions
$\text{Log}(d^{\text{WW1}})$	0.123* (0.075)	0.238*** (0.089)	0.199*** (0.061)
Mean of dep.var.	0.35	0.43	0.15
First stage F-stat	34.86	35.13	35.13
Obs.	6764	6764	6764

1% more deaths in WW1  $\rightarrow$  0.26% higher Pr(build memorial),  
0.7% higher Pr(Legion).

- Rule out other channels through which WW1 deaths lead to more WW2 deaths

### **Economic effects of WW1 deaths**

- No effect on intra-war economic outcomes. [► Results](#)

### **Confounders that affect WW2 deaths through enlisting**

- No effect on WW2 mobilisation. [► Results](#)

## **Intergenerational vs. community transmission of values**

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## Effect of losing a family member

- What happens to soldiers who lost their **father** or relative in WW1?
- Use 1911 Census and match individuals to WW2 deaths.
- Useful to investigate role of *vertical* transmission of values vs. *community* transmission.
- Regress 1(die in WW2) on WW1 death shock and indicators if a household member die in WW1 (father, other).



## OLS results – Effect of WW1 deaths on P(die in WW2) %

	(1) Pr(Die in WW2)	(2) Pr(Die in WW2)
$\text{Log}(d^{WW1})$	0.026** (0.012)	0.025** (0.012)
Father died		0.303*** (0.082)
Oth.HH died		-0.078 (0.066)
Mean of dep.var.	1.02	1.02
Obs.	1704188	1704188
R2	0.002	0.002

Notes: Individual-level regressions

## **Does legacy of past war deaths affect combat motivation?**

### **Main take-aways**

Communities with more WW1 deaths:

- Have more WW2 deaths
- Soldiers more likely to be awarded honours
- Have more memorials, veterans' associations & charities

### **Implications**

- Past wars & commemoration build up civic capital that can motivate soldiers.
  - Complementary to propaganda/recruitment campaigns.

# Appendix

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## Mobilization controls

- Mobilized soldiers (logs)
- Population (logs)
- Fraction of men of military age
- Fraction of inhabitants employed in the army
- Share in protected occupations
- Share married.

## Socio-economic controls

- Population density (logs)
- Shares of households with 1, 2 or more servants
- Share of white collar workers
- Mean number of rooms in each home
- Proxy for unemployment rate.

## Fixed effects

- 52 Historical county dummies
- 93 dummies for parish  $i$  having mobilised at least one soldier to regiment  $j$ .

## OLS results – Effect of WW1 Deaths on WW2 Mobilisation

	(1) $\text{Log}(m^{1945})$	(2) $\text{Log}(m^{1945})$	(3) $\text{Log}(m^{1945})$	(4) $\text{Log}(d^{WW2})$
$\text{Log}(d^{WW1})$	0.003 (0.027)	-0.034 (0.028)	-0.034 (0.028)	0.384*** (0.105)
Mean of dep.var.	8.43	8.43	8.43	6.26
Obs.	504	504	504	504
R2	0.80	0.97	0.97	0.83
Mobil. controls	N	Y	Y	Y
Econ. controls	N	Y	Y	Y
County FE	N	Y	Y	Y
Regiment mob.	N	N	Y	Y

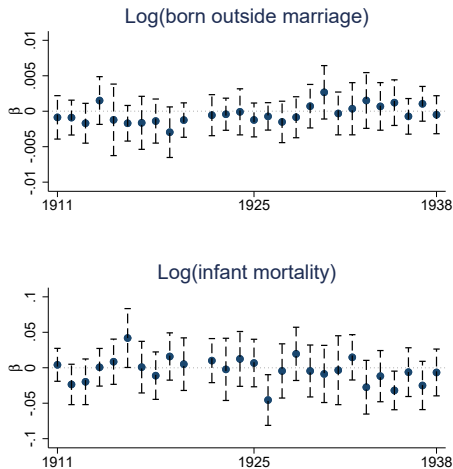
## OLS results – (no) Effect of WW1 Deaths on economic outcomes

	(1) Unemp.	(2) Inf. deaths	(3) Out wed.	(4) Age 15-64
<b>A. 1921 or 1922</b>				
$\text{Log}(d^{WW1})$	0.003 (0.011)	0.016 (0.019)	-0.019 (0.020)	-0.005 (0.004)
Obs	1401	1365	1323	1400
<b>B. 1931</b>				
$\text{Log}(d^{WW1})$	0.012 (0.015)	-0.011 (0.027)	-0.001 (0.019)	-0.011 (0.007)
Obs	1360	1297	1265	1358
Mobil. controls	Y	Y	Y	Y
Econ. controls	Y	Y	Y	Y
County FE	Y	Y	Y	Y

Notes: district-level regressions

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# WW1 Deaths and Pre- and Inter-War Economic Outcomes



Notes: Each point is an estimate from a separate district-level OLS regression of the outcome shown on  $\text{Log}(d^{WW1})$ .

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# (partial) Order of Battle of the First Division

## The order of battle of the 1st Division

### Units and sub-formations

### Dates with division

1st Guards Brigade

On the formation of the Guards Division in August 1915, this brigade lost its two Guards battalions and was retitled as the 1st Brigade.

1st Bn, the Coldstream Guards

From start. Left August 1915

1st Bn, the Scots Guards

From start. Left August 1915

1st Bn, the Black Watch

Throughout

2nd, the Royal Munster Fusiliers

From start. Left August 1914 after near-destruction at the Rearguard Affair of Etreu

1st Bn, the Cameron Highlanders

Joined September 1914

1/14th Bn, the London Regiment

Joined November 1914, left February 1916

10th Bn, the Gloucestershire Regt

Joined August 1915

8th Bn, the Royal Berkshire Regt

joined August 1915, left 2 February 1918

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1ST Battalion  
2ND Battalion  
3RD Battalion  
1/4TH Battalion  
1/5TH Battalion  
1/6TH Battalion  
2/4TH Battalion  
2/5TH Battalion  
2/6TH Battalion  
3/4TH Battalion  
3/5TH Battalion  
3/6TH Battalion  
7TH Battalion  
8TH Battalion  
9TH Battalion  
10TH Battalion  
11TH Battalion  
12TH Battalion  
1ST Garrison Battalion

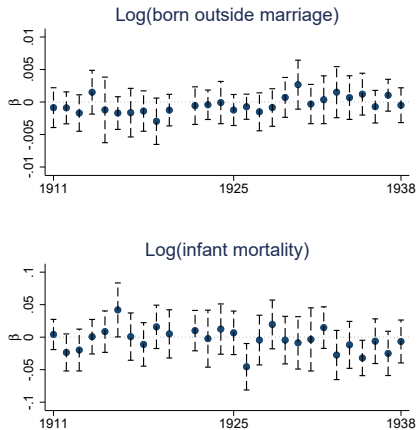
## OLS results – Effect of WW1 Deaths WW2 Mobilisation

	(1) $\text{Log}(m^{1945})$	(2) $\text{Log}(m^{1945})$	(3) $\text{Log}(m^{1945})$	(4) $\text{Log}(d^{WW2})$
$\text{Log}(d^{WW1})$	0.003 (0.027)	-0.034 (0.028)	-0.034 (0.028)	0.384*** (0.105)
Mean of dep.var.	8.43	8.43	8.43	6.26
Obs.	504	504	504	504
R2	0.80	0.97	0.97	0.83
Mobil. controls	N	Y	Y	Y
Econ. controls	N	Y	Y	Y
County FE	N	Y	Y	Y
Regiment mob.	N	N	Y	Y

# OLS results – (no) Effect of WW1 Deaths on economic outcomes

	(1) Unempl.	(2) Infant Death	(3) Unmarried	(4) Pop.Growth	(5) Working Age
<b>A. 1921/1922</b>					
$\text{Log}(d^{WW1})$	-0.029 (0.066)	0.110 (0.085)	0.096 (0.116)	-1.348 (0.878)	-0.098 (0.098)
Mean dep.var.	7.80	6.72	4.92	7.84	65.60
Observations	1694	1691	1691	1694	1694
<b>B. 1931</b>					
$\text{Log}(d^{WW1})$	-0.079 (0.059)	-0.011 (0.135)	-0.015 (0.123)	3.375 (2.873)	-0.101 (0.084)
Mean dep.var.	5.79	5.80	4.74	22.22	67.85
Observations	1695	1695	1695	1695	1695
Mobil. controls	Y	Y	Y	Y	Y
Econ. controls	Y	Y	Y	Y	Y
County FE	Y	Y	Y	Y	Y

# WW1 Deaths and Pre- and Inter-War Economic Outcomes



Notes: Each point is an estimate from a separate district-level OLS regression of the outcome shown on log WW1 dead. [► Back](#)

# The Spanish Flu deaths have no effect on WW2 deaths [► Back](#)

- Study whether Spanish Flu deaths relate to the finding or yield similar estimates (they do not).

	(1) $\text{Log}(d^{\text{Flu}})$	(2) $\text{Log}(d^{\text{WW2}})$	(3) $\text{Log}(d^{\text{WW2}})$	(4) $\text{Log}(d^{\text{WW2}})$
$\text{Log}(d^{\text{WW1}})$	0.039 (0.070)	0.412*** (0.131)		0.410*** (0.136)
$\text{Log}(d^{\text{Flu}})$			0.104 (0.289)	0.059 (0.275)
Mean of dep.var.	5.40	5.44	5.44	5.44
Obs.	260	260	260	260
R2	0.97	0.89	0.89	0.89
Mobil. controls	Y	Y	Y	Y
Econ. controls	Y	Y	Y	Y
County FE	Y	Y	Y	Y