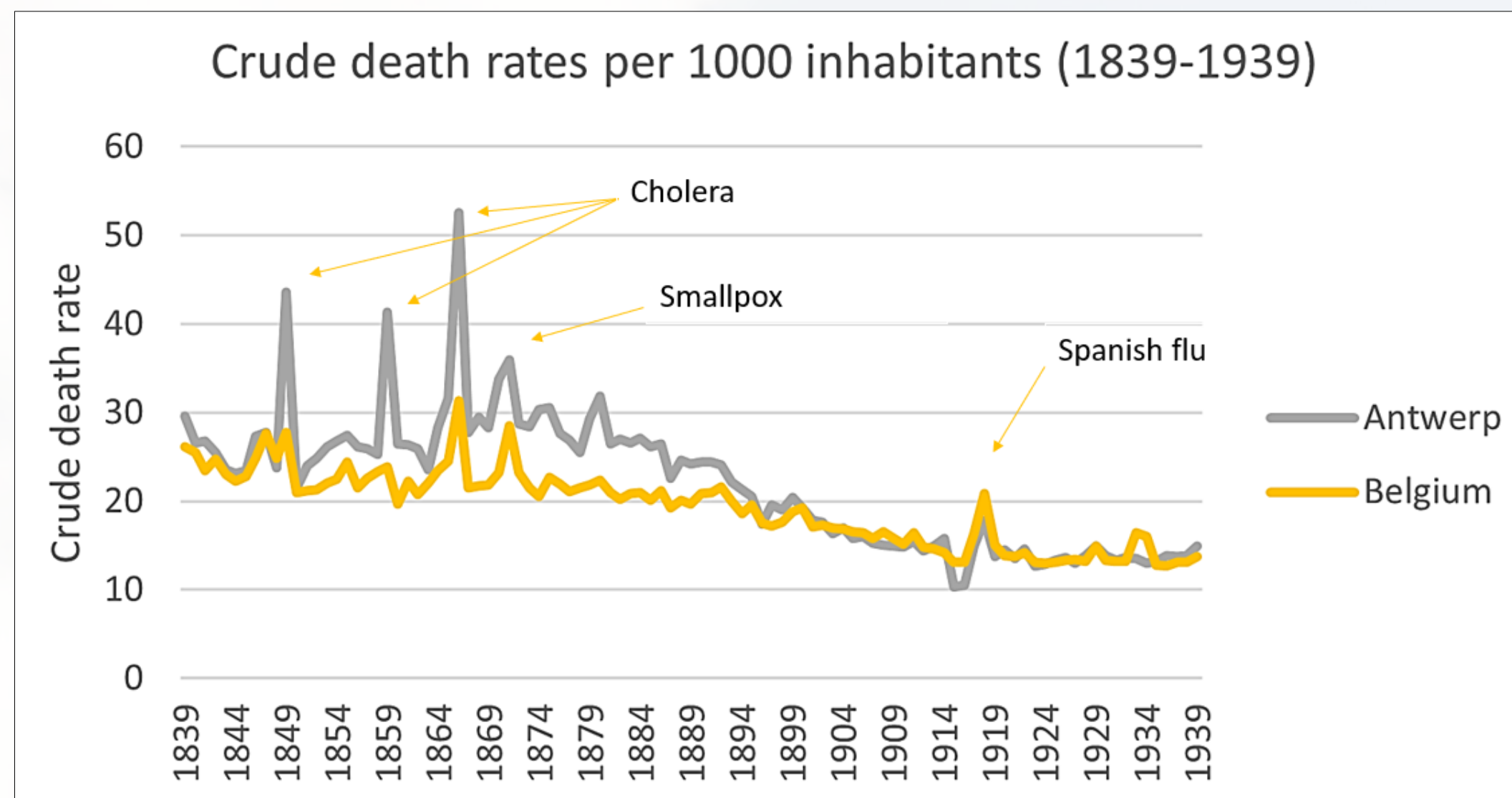


DISENTANGLING DEATH DISPARITIES: A SOCIAL ANALYSIS OF CAUSE-SPECIFIC MORTALITY IN ANTWERP (1820-1939)

1. BACKGROUND: MORTALITY DECLINE

Over the last two centuries, **life expectancy** has more than doubled in Western Europe, rising from 30-40 years in the mid-19th century to over 80 years today. This increase in life expectancy has been accompanied by a **shift in the main causes of death**, known as the **epidemiological transition**.

But how did this mortality decline and shift in causes of death varied across social groups, and what factors influenced these differences?



2. SES INEQUALITIES IN MORTALITY

In addition to factors such as age, sex, religion, and origin, **current research** shows a strong link between **socioeconomic status (SES)** and **mortality**, known as the **social gradient**, with lower SES often associated with a shorter lifespan. Since the 1990s, the social gradient in Belgium has widened, resulting in a gap in life expectancy between the lower and upper 5% of the population of 13 years for men and 10 years for women (Eggerickx et al. 2020).

In **historical research** the evidence for a social gradient in mortality remains ambiguous, mainly due to sparse data. Three hypotheses have been put forward to explain these differences and how the cause-of-death patterns have changed over time:

- **Convergence:** Inequalities emerged with industrialization (1650-1850) but have since narrowed (Vallin 1980).
- **Divergence:** Inequalities only emerged and grew in the 20th century, alongside the welfare state and medical progress (Razzell and Spence 2004, Riley 2001).
- **Constancy:** inequalities persist across time and space and are considered inevitable (Link and Phelan 1995, 1996, 2002).

3. RESEARCH QUESTIONS AND HYPOTHESIS

Research questions: My study examines the cause-specific mortality profiles of infants, children, and adults in Antwerp between 1820 and 1939 and addresses the following questions:

- How did cause-of-death mortality evolve by **age, sex, and religion**?
- How did the **social gradient** in cause-specific mortality evolve?
- How can we explain the results? What are the possible **determinants**?

Hypothesis: My study tests the **Extended Fundamental Cause Theory (FCT)** which posits that social inequalities in mortality evolve according to the rise and fall of diseases (c.f. Mackenbach 2020).

4. SOURCES AND METHODOLOGY

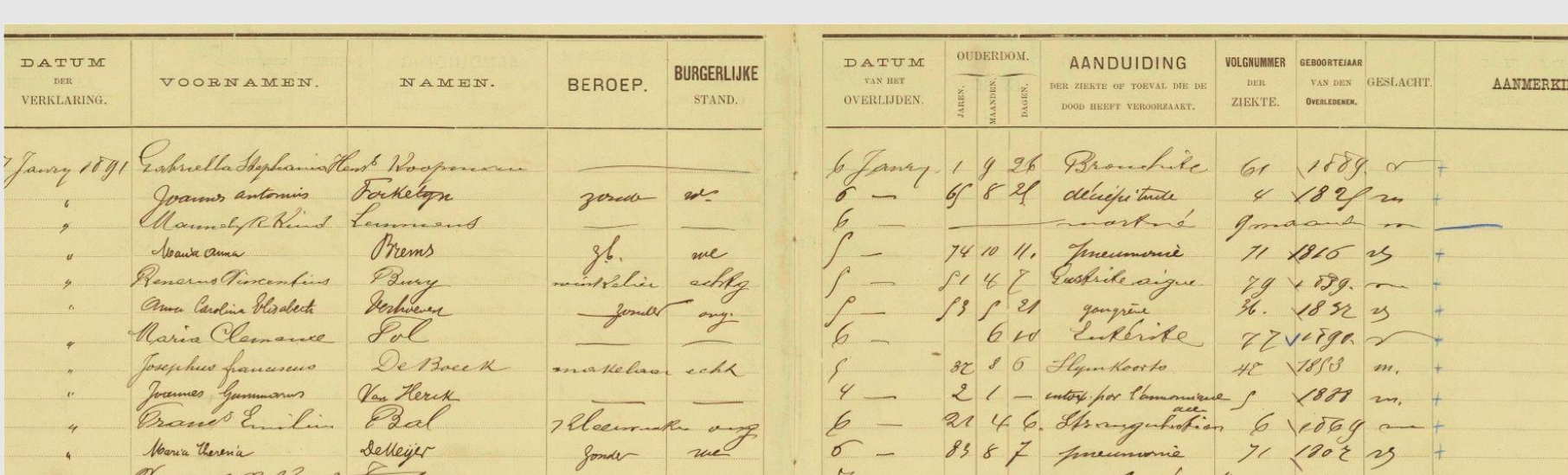
• **Source:** This research utilises the **S.O.S. Antwerp database (1820-1946)**, which contains data on ca. 500,000 individuals from the Antwerp cause-of-death register (e.g. cause of death, age, sex, civil status) linked to the birth and death certificates (e.g. parental occupation, addresses). This data was collected by volunteers in the citizen science project www.sosantwerpen.be.

• **Methodology:** Each occupation will be coded to the HISCO classification, and each cause of death to the ICD10h coding system to enable international comparisons. Information on age, sex, religion and (parental) occupation (as a proxy for SES) will enable social analysis and a comprehensive basis for both **quantitative** (bivariate and multivariate analyses) and **qualitative** approaches (including municipal and local health service reports, newspapers, etc.).

Key Descriptives of the S.O.S. Antwerpen Database

	Total	Percentage
Sex:		
Male	255929	53
Female	224988	47
Unknown	43	0
Place of birth:		
Belgium	438248	91
Antwerp (Belgium)	299557	62
Outside Belgium	42712	9
Age distribution:		
Stillbirths	29953	6
Infants (<1 year)	96014	20
Early childhood (1-4 year)	58103	12
Children and adolescents (5-19 year)	25717	5
Adults (20-64 year)	169604	35
Elderly (65+ year)	101569	21
Occupational data:		
Occupations of deceased	232389	
Occupations of deceased (20+ year)	224115	
Partner's occupation	54388	
Father's occupation	202322	
Mother's occupation	64443	
Total number of people for whom we could determine SES by occupation	438161	91
People with unknown SES	42799	9
Total individuals with cause of death	480960	100

5. FROM DEATH TO DATA? HOW TO INTERPRET AND COMPARE INDIVIDUAL-LEVEL CAUSES-OF-DEATH DATA OVER TIME AND PLACE?



Naam	Overleden Antwerpen?	Sterfteplaats Naam	Sterfteplaats Key	Sterfte land Key	Aangifte Dag	Aangifte Maand	Aangifte Jaar	St...
Mertens	1	Antwerpen	LKS_0063	BEL	10	11	1828	
Chaineux	1	Antwerpen	LKS_0063	BEL	10	11	1828	
Loeckx	1	Antwerpen	LKS_0063	BEL	10	11	1828	
Van Gucht	1	Antwerpen	LKS_0063	BEL	10	11	1828	
Wallef	1	Antwerpen	LKS_0063	BEL	10	11	1828	
Verdonck	1	Antwerpen	LKS_0063	BEL	10	11	1828	
Biesemortel	1	Antwerpen	LKS_0063	BEL	10	11	1828	
Goethals	1	Antwerpen	LKS_0063	BEL	11	11	1828	

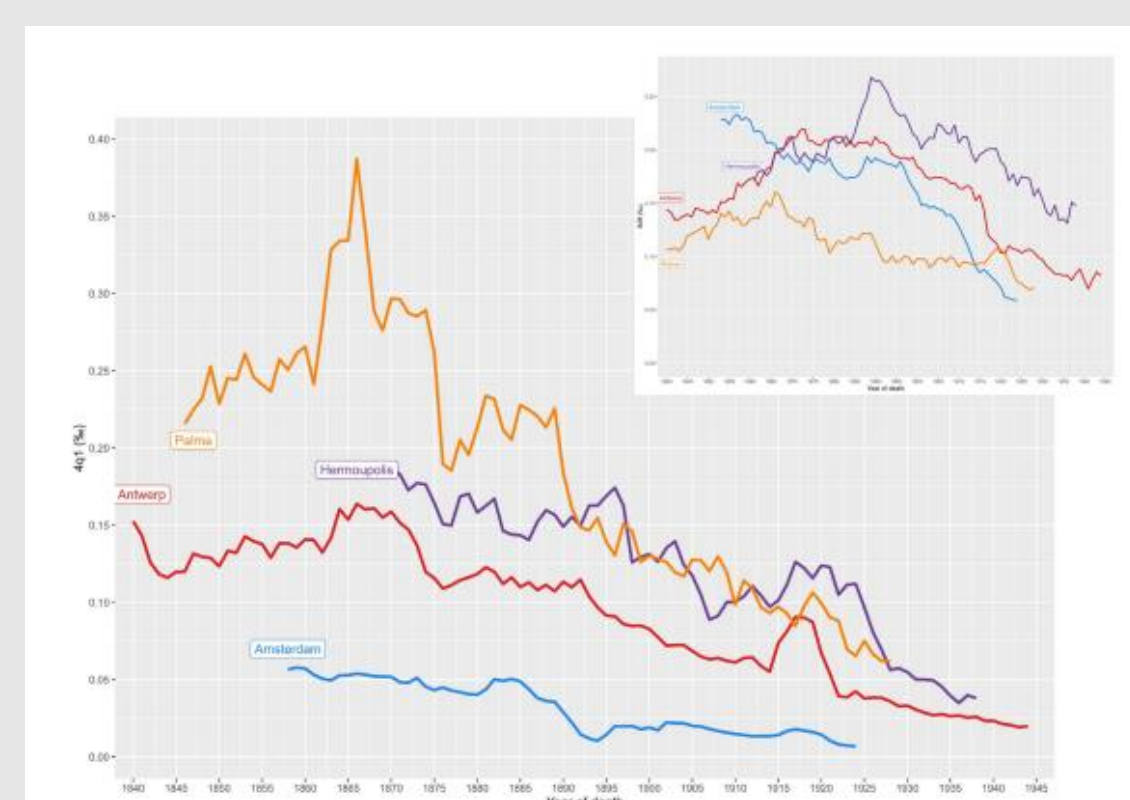


1. Main source of the project: the cause-of-death register of Antwerp

2. All data from the register were transcribed, digitised by volunteers, and linked to the birth and death certificates in the S.O.S. Antwerp dataset.

3. Historical causes of death, often obscured by outdated and incomplete terms, require consulting historical medical dictionaries for accurate interpretation.

ICD10h_1	ICD10	icd10_2levelCATEGORY	ICD10_2levelCAUSE	ICD10h_DESCRIPTION
A36.901	A36.9	Diphtheria	Diphtheria, unspecified	Diphtheria with bronchiti
A36.908	A36.9	Diphtheria	Diphtheria, unspecified	Diphtheria with other cor
A37.000	A37.0	Whooping cough	Bordetella pertussis	Whooping cough due to f
A37.100	A37.1	Whooping cough	Bordetella parapertussis	Whooping cough due to f
A37.800	A37.8	Whooping cough	Bordetella species	Whooping cough due to c
A37.900	A37.9	Whooping cough	Whooping cough, unspecified	Whooping cough, unspec
A37.901	A37.9	Whooping cough	Whooping cough, unspecified	Whooping cough with coi
A38.000	A38	Scarlet fever	Scarlet fever	Scarlet fever
A38.001	A38	Scarlet fever	Scarlet fever	Scarlet fever with complic
A38.002	A38	Scarlet fever	Scarlet fever	Scarlatina
A38.003	A38	Scarlet fever	Scarlet fever	Scarlatina with complicat
A39.000	A39.0	Meningococcal infection	Meningococcal meningitis	Meningococcal meningiti



4. All causes of death are linked to the recently developed ICD10h, which connects historical causes to the modern ICD-10 classification.

5. Coding the Antwerp cause-of-death data to ICD10h enables cause-specific comparisons over time and a broader integration into international historiography.

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