



Original Research

A lesson from history? Worsening mortality and the rise of the Nazi Party in 1930s Germany



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ABSTRACT

Objectives: The aim of the study was to test the hypothesis that worsening mortality rates in the early 1930s were associated with increasing votes for the Nazi Party.

Study design: The study consist of panel data with fixed effects.

Methods: We used district- and city-level regression models of Nazi vote shares on changes in all-cause mortality rates in 866 districts and 214 cities during federal elections from 1930 to 1933, adjusting for election and district/city-level fixed effects and sociodemographic factors. As a falsification test, we used a subset of deaths less susceptible to sociopolitical factors.

Results: Historical downward trends in mortality rates reversed in the early 1930s in Germany. At the district/city level, these increases were positively associated with a rising Nazi vote share. Each increase of 10 deaths per 1000 population was associated with a 6.51-percentage-point increase in Nazi vote share (95% confidence interval = 1.17–11.8). The strongest associations were with deaths due to infectious and communicable diseases, suicides, and alcohol-related deaths. Worsening mortality had no association with votes for the Communist Party or for other contemporary political parties. Greater welfare payments were associated with smaller increases in both mortality and Nazi vote share, and adjusting for welfare generosity mitigated the association by approximately one-third.

Conclusions: Worsening mortality rates were positively associated with the rise of the Nazi Party in 1930s Germany. Social security mitigated the association between mortality and Nazi vote share. Our findings add to the growing evidence that population health declines can be a ‘canary in the coal mine’ for the health of democracies.

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Introduction

Although the Weimar Republic (1918–1933) was a short parenthesis in Germany's history, it is among its most consequential. The rise of Nazism in the early 1930s, in the wake of the Great Depression, coincided with worsening economic hardship¹ characterized by severe austerity policies,² mass unemployment,³ and widespread discontent. Yet, while other countries also faced economic insecurity, Germany experienced an increase in mortality starting in 1931–1932, at a time when mortality was declining in

other European nations including Poland, France, and the Netherlands.

A series of recent articles have found a striking and consistent correlation between deteriorating population health and support for populist radical right parties.⁴ Bor,⁵ Wasfy et al.,⁶ Herrin et al.,⁷ and Bilal et al.⁸ found that those counties in which life expectancy stagnated or declined from 1980 to 2014 exhibited substantially higher vote shares for Donald Trump in the 2016 presidential election. Similar patterns were observed in the UK, where worsening mortality, alongside budget reductions, was positively associated with greater votes for Brexit.^{9,10} Several studies have linked ‘deaths of despair,’ including external causes of death such as suicides and alcohol-related mortality, to a greater share of votes for the Republican Party.^{11–13} Stagnating or rising mortality has been linked to economic dislocation in the absence of a robust safety net. US areas that lost manufacturing jobs to Chinese competition in the

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2000s saw increasing male midlife mortality and a shift among voters toward Republican candidates in US House and Presidential elections.^{14,15}

Support for the Nazi Party rose from 2.68% of the German electorate in 1928 to 43.9% by 1933. However, the rise in Nazi support varied geographically. Here, we test the hypothesis that worsening mortality rates at the state, district, and city level were associated with the rise of the Nazi Party in Germany, even after accounting for economic hardship and other potential confounding factors. Specifically, we test whether the increase in mortality in the early 1930s was a ‘canary in the coal mine’ for the growth in Nazi support, asking whether populations suffering health declines are fertile ground for populist politics.

Methods

Sources

Voting data were obtained for four federal elections between 1930 and 1933 (September 1930, July and November 1932, and March 1933) covering 16 states, 866 districts, and 214 cities. Details were described elsewhere,² and we provided full details of our sources in a supplementary file, but briefly, these were drawn from official German statistics. In the German federal elections, under the principle of proportional representation, people voted for nationwide party lists to decide who would be the chancellor. To measure support for the Nazi Party, we captured vote shares as a proportion of the total vote. We also measured changes in other parties’ shares, including the Social Democratic Party, the Center Party, the Communist Party, and a residual category of other small parties. We evaluated changes in vote shares across elections (e.g., between 1930 and 1932 and from 1932 to 1933) and over the entire period (1930–1933).

To measure mortality rates, we used three levels of aggregation based on the data characteristics. We extracted new data on the main vital statistics (population, births, and deaths) at the district level, covering the calendar years 1927–1933 ($n = 866$). We also collected mortality data for 214 cities, where cause-specific mortality was available for 20 causes of death (city-level data being available for 1928, 1932, and 1933). In addition, at the state level, we disaggregated annual mortality data into 7 age bands to calculate age-standardized mortality rates for each German state ($n = 16$). Annual crude death rates are calculated per thousand population. At the city level, we further disaggregated deaths into two groups. One includes deaths plausibly linked to deteriorating social conditions over the short term (including deaths from suicides, homicides and murders, and stroke), whereas we used a second group as a falsification test, which should be less responsive to sociopolitical changes including cancer deaths.

To adjust for economic decline, based on district-level tax returns, we estimated per capita (taxable) income in each district. At the city level, we proxy economic conditions by the number of unemployed as a share of the total population. Finally, we also proxy the extent to which the Weimar Republic provided social protection, using newly extracted district-level data from official sources on welfare spending per capita, capturing social security payments from central governments and lower levels of government on open care (mostly relief and medical assistance). Appendix A shows descriptive statistics for all variables.

Methods

Multivariate regression models were used to quantify the association between German mortality rates and Nazi vote share

using a difference-in-differences with an intensity of treatment interpretation based on:

$$\text{NAZI}_{d,t} = \alpha + \beta_1 \text{Mortality}_{d,t-1} + \beta_2 \text{Income}_{d,t-1} + \beta_3 \text{Welfare}_{d,t-1} + \gamma_d + \delta_t + e_{d,t} \quad (1)$$

where d denotes districts, t is one of the four election years (September 1930, July and November 1932, and March 1933), and $\text{NAZI}_{d,t}$ is the vote share of the Nazi Party in percentages of the total vote (%). Because age-standardized mortality data are not available at the local level, $\text{Mortality}_{d,t-1}$ is simply the crude death rate in the year before the election year, $\text{Income}_{d,t-1}$ denotes income per capita, and $\text{Welfare}_{d,t-1}$ denotes the welfare payments per capita in the year before the election, both expressed in nominal terms. All models include district-level fixed effects (γ_d) and fixed effects for the calendar years of 1932 and 1933 (δ_t). By pooling data for different elections and using time and district fixed effects, mortality here can be interpreted as excess mortality or deviations of mortality from the within-district sample mean. Finally, $e_{d,t}$ is the error term. Standard errors are clustered at the state level, although clustering at lower levels (i.e., district) displays the same levels of statistical significance. For simplicity, when we say states, we also mean Prussian provinces.

Results

Association of mortality with Nazi voting

We first investigate the visual association of mortality increases and Nazi voting shares at the state level, followed by subsequent analyses at the district and city levels.

Fig. 1 depicts the unconditional association between the change in state mortality rates from 1928 to 1933 and the Nazi vote share in 1933 at the state level. As shown, those states with greater mortality rises also experienced larger votes for the Nazi Party in 1933 ($r = 0.41$, $P\text{-value} = 0.00$). A similarly strong correlation was evident at the district level ($r = 0.11$, $P\text{-value} = 0.00$).

Table 1 shows the results from multivariate regression models on the impact of mortality and the Nazi Party vote share estimated at the district level and sequentially adjusted for economic hardship (measured by income per capita). Fixed effects would have adjusted for any time-invariant characteristics of the districts (possibly, environmental and sociodemographic confounders). Even after adding these controls, worsening health was associated with rise in Nazi votes. When we use data for the four elections

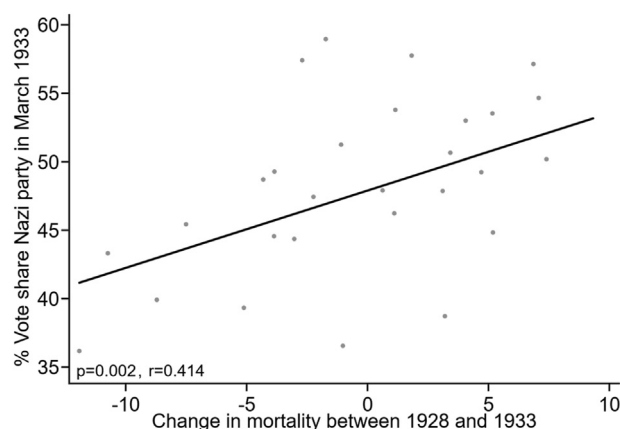


Fig. 1. Percentage of state-level vote shares for the Nazi Party in 1933 and changes in the crude death rate between 1928 and 1933.

Table 1
District-level impact of mortality on the Nazi Party vote share.

Variable	Elections, 1930 and 1933 (n = 1732)		Elections, 1930 and 1932 (both) (n = 2598)		All elections (n = 3464)	
	b (95% CI)		b (95% CI)		b (95% CI)	
Mortality	0.88	(0.23, 1.53)	0.78	(0.11, 1.45)	0.65	(0.12, 1.18)
Income	-2.88	(-3.88, -1.87)	-2.34	(-3.35, -1.33)	-2.32	(-3.36, -1.27)

CI = confidence interval.

Parameter estimates are unstandardized regression coefficients representing the percentage point increase in vote shares for the Nazi Party associated with an increase of 1 death per 1000 population. We use a balanced panel of 866 districts and pooled data for different elections. All models control for income per capita and add district-level fixed effects and a fixed effect for to the election time: a 1929–1930 fixed effect for the 1930 election, a 1931–1932 fixed effect for the elections of 1932 (either June or November), and a 1932–1933 fixed effect for the election of 1933. Robust standard errors are clustered at the state level (Prussian provinces are considered different states).

between 1930 and 1933, each increase of 10 deaths per 1000 population was associated with a 6.51-percentage-point increase in the Nazi vote shares (95% confidence interval [CI] = 1.17 to 11.8). The results were robust to focusing on just the 1930–1932 elections and the 1932–1933 elections.

Next, at the city level, we disaggregated all-cause mortality into those types that could plausibly be impacted by changes in contemporary social conditions, including suicides, homicides, and stroke, whereas a second group, which should be less responsive in the short term to sociopolitical changes including cancer deaths, was used as a falsification test. Table 2 shows the results of these city models. For those linked to social conditions, each increase of 10 deaths per 1000 population was associated with a 31.71-percentage-point increase in the Nazi vote shares (95% CI = 11.91 to 51.50). By way of contrast, when we compare these patterns with causes of death that are less responsive to short-term social conditions, using cancer mortality, the results are not statistically significant (13.10; 95% CI = -12.42 to 38.61). Appendix B reports disaggregated models for each of the 20 causes of death, revealing that Nazi vote rises were most closely associated with infectious and communicable diseases such as tuberculosis, measles, and lung infections, as well as the aforementioned deaths from suicides, alcohol-related deaths, and stroke.

Comparing vote patterns by district characteristics

In Appendix C, we explore potential heterogeneity in the association of mortality increases and the Nazi electoral boost, stratifying by district characteristics. Using data from the census of 1933, we split the sample for districts with occupational and religious group shares below and above the median value. When we stratify the sample, we find that mortality had a stronger association with

Table 2
City-level impact of amenable and non-amenable mortality on the Nazi Party vote share.

Variable	Elections, 1928 and 1933 (n = 428)	
	b (95% CI)	
Amenable mortality	3.17	(1.19, 5.15)
Non-amenable mortality	1.31	(-1.24, 3.86)

CI = confidence interval.

Parameter estimates are unstandardized regression coefficients representing the percentage point increase in vote shares for the Nazi Party associated with an increase of 1 death per 1000 population. We use a balanced panel of 214 cities and pooled data for two elections. Amenable mortality groups the following causes: stroke, suicide and murder, or homicide. Non-amenable mortality includes deaths from cancer. We add city-level fixed effects and a 1932–1933 fixed effect for the election of 1933. Although cause-specific mortality is only available in 1928 and 1933, the comparison from 1928 to 1933, coming from local deviations from undisturbed levels, is a good measure from the German suffering in the elections of March 1933. Robust standard errors are clustered at the state level (Prussian provinces are considered different states).

Nazi vote shares in more agricultural districts and a weaker association in more industrial districts. This finding is consistent with the prior literature that found that the unemployed did not favor the Nazis at the polls (they turned to the Communists).^{2,3} Instead, it was those just above in the economic hierarchy, who also experienced great hardship, who had something to lose, who favored the Nazis. The effects of mortality were also stronger in areas with a higher number of Protestants and Jews. With respect to the latter, Voigtländer and Voth¹⁶ outlined the importance of long-standing antisemitism in the Nazi electoral boost.

Mitigating role of welfare payments

We further evaluated the role of welfare payments to buffer economic suffering, which may have acted as a confounder. Appendix D shows that adding a control for welfare payments significantly reduces the impact of mortality on the Nazi vote share. The results are still statistically significant for mortality in some models. However, the coefficient on welfare payments is also statistically significant, and its negative sign indicates that social security may have mitigated radicalization. Importantly, for our argument, the size of the coefficient for mortality when controlling for welfare is cut down by between one-third and two-thirds based on specification, for instance, by 4.85 deaths per 100,000 population (95% CI: 1.37 to 8.33), when considering data for the four elections between 1930 and 1933.

Robustness checks

We performed a series of robustness tests. As shown in Table 1, we used data from different elections, showing that our results are not specific to a single election, but to a process of worsening social and financial conditions that collapsed in the early 1930s. In Appendix E, instead of using panel data with fixed effects, we show consistent results computing the percentage point change in the crude death rate (the change in the level) between elections. In Appendix F, we also show consistent results using infant mortality rates instead of crude death rates for all ages, despite having a lower predictive value, probably because births to the poorest families fall disproportionately during a recession.¹⁷ Although disaggregated age bands were not available at the district or city level, these were available at the state level for 7 age bands. Despite state-level models being statistically underpowered (relying on 16 data points for 16 states as in the age-band statistics Prussian provinces counted as a single state), we found that by using the age bands to calculate age-standardized mortality rates, none of the results was qualitatively changed (see Appendix G). Using Eq. (1), a further check we did in the age structure was interacting the mortality rates with time dummies (Appendix H). These interaction terms ensured that our models are not simply showing worsening health of older Germans at a time of crisis. Finally, to further account for

falling revenues as a result of the Great Depression, we also show consistent results with those in Table 1 after interacting a precrisis income indicator (in 1928) with time dummies (Appendix I). Our bottom line is that the association between mortality and the rise in Nazi support persists even after adjusting for income and other sociodemographic factors, implying that poor health is not simply a proxy or mediator for a relationship between income and Nazi support.

Discussion

Our analysis shows a significant association between mortality rates and increasing vote shares for the Nazi Party in 1930s Germany. These rises in Nazi vote share were most strongly correlated with deaths from infectious diseases including tuberculosis and pneumonias, as well as suicides, homicides, and heart attacks. In addition, we found that adjusting for levels of welfare support attenuated this correlation, suggesting that the generosity (or stinginess) of state and local welfare regimes may have been a common cause of the observed health and political trends.^{18,19}

Study limitations

Before interpreting our findings further, we must note several important limitations. First, we were unable to adjust for age at district and city levels, creating potential for error. However, our results were consistent when performed at the state level, wherein direct age adjustment was possible. Furthermore, our interaction terms and district- and city-level fixed effects would have adjusted for any time-invariant characteristics of the age distribution. Second, it is possible that a third underlying factor drove both mortality rises and Nazi vote shares. Indeed, we found that adjusting for welfare generosity attenuates the mortality-voting relationship. Hence, the observational analysis can only demonstrate correlation, rather than causal effects. However, this modeling approach with controls and fixed effects follows that of recent analyses on mortality and Trump votes in the US⁵ and on mortality and Brexit votes in the UK.⁹ Whether or not they are a direct cause, mortality increases appear to be an early-warning measure for political polarization.

Our article has implications for future research. Welfare payments seem important in attenuating the Nazi-mortality association, which is consistent with the historical literature that budget cuts implemented in 1931–1932 by Chancellor Brüning, commonly known as the ‘Hunger Chancellor,’ positively correlated with the rise of the Nazi Party.² We also showed that the association between mortality rates and Nazi vote shares was strongest in rural districts. Yet, further research is needed to investigate these underlying mechanisms and better understand the complex causal chains involved.

In Appendix J, we show that the Nazi Party was the only party that managed to transform German suffering into more votes. Neither the communists, who traditionally were seen as guardians of the interests of working people, the Social Democrats, the political home of the workers’ movement and middle classes, nor the Center party, a conservative catholic party, saw gains in support with the declining health of the electorate. We interpret this as evidence that at times when people are suffering, they may be more open to the siren calls of right-wing radical populist parties.

Our article supports the notion that epidemiological data can serve as a ‘canary in the coal mine,’ identifying populations that are being left behind by social progress, which may in turn create fertile ground for receptivity to populist messages. As Keynes gloomily foreshadowed in *The Economics Consequences of the Peace*, “If we take the view that for at least a generation to come Germany cannot be trusted with even a modicum of prosperity ... that year by year Germany must be kept impoverished and her children

starved and crippled ... If we aim deliberately at the impoverishment of Central Europe, vengeance, I dare predict, will not limp.”²⁰(p199-200).

Author statements

Ethical approval

The authors have no conflicts to declare. The authors used historical statistical records based on official data.

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Competing interests

The authors have no conflicts to declare.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.puhe.2021.03.022>.

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