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# Are employment and social integration more strongly associated with deaths of despair than psychological or economic distress?

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ABSTRACT

The label "deaths of despair" for rising US mortality related to drugs/alcohol/suicide seems to implicate emotional distress as the cause. However, a Durkheimian approach would argue that underlying structural factors shape individuals' behavior and emotions. Despite a growing literature on deaths of despair, no study has directly compared the effects of distress and structural factors on deaths of despair versus other causes of mortality. Using data from the Midlife in the United States study with approximately 26 years of mortality follow-up, we evaluated whether psychological or economic distress, employment status, and social integration were more strongly associated with drug/alcohol/suicide mortality than with other causes. Cox hazard models, adjusted for potential confounders, showed little evidence that psychological or economic distress were more strongly associated with mortality related to drugs/alcohol/suicide than mortality from other causes. While distress measures were modestly, but significantly associated with these deaths, the associations were similar in magnitude for many other types of mortality. In contrast, detachment from the labor force and lower social integration were both strongly associated with drug/alcohol/suicide mortality, more than for many other types of mortality. Differences in the estimated percentage dying of despair between age 25 and 65 were larger for employment status (2.0% for individuals who were neither employed nor retired versus only 0.6% for currently employed) and for social integration (1.9% for low versus 0.7% for high integration) than for negative affect (1.2% for high versus 0.8% for no negative affect). Most of the association between distress and drug/alcohol/suicide mortality appeared to result from confounding with structural factors and with pre-existing health conditions that may influence both the perception of distress and mortality risk. While deaths of despair result from self-destructive behavior, our results suggest that structural factors may be more important determinants than subjective distress.

## 1. Introduction

Rising mortality related to drugs/alcohol/suicide is often cited as a key contributor to declines in US life expectancy (Case and Deaton, 2020; Elo et al., 2019; Harris et al., 2021). These deaths are frequently labeled "deaths of despair" (Case, 2015; Case and Deaton, 2020; Khazan, 2015; Krugman, 2015), but it is unclear whether researchers hypothesize distress to be the underlying cause of these deaths.

Case and Deaton (2015, 2017) repeatedly mentioned increasing "distress" in their work, but they did not specify whether this distress stems from psychological appraisal or economic insecurity. Despite a growing literature on rising deaths of despair, there is no well-established definition or operationalization of the term "despair." As Gutin et al. (2023) pointed out, much of the research seems to promote a tautological conceptualization of despair inferred from its outcomes. Some researchers define despair very broadly (Shanahan et al., 2019), such as one study that created a multidimensional construct including behavioral (e.g., delinquency, social isolation, work instability, sleep problems), emotional (e.g., depression, PTSD, anger), physical (e.g., functional limitations, obesity), and biomarker-based (e.g., allostatic load) measures (Gutin et al., 2023). More importantly, neither Case and Deaton (2015, 2017, 2020) nor any other scholar has directly tested the link between despair and these deaths. We view despair as inherently subjective, which is consistent with the theories

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from Durkheim and contemporary sociologists (Mueller et al., 2021). Therefore, we operationalized it in terms of psychological and economic distress, distinguishing between those subjective measures and more objective factors such as employment and social integration. *If deaths related to drugs/alcohol/suicide are truly deaths of despair, we would expect psychological or economic distress to be more strongly associated with those deaths than with mortality from other causes (**Hypothesis 1**).*

Alternatively, Durkheim (1897) might have argued that broader "social facts" are crucial in understanding the psychological pain of individuals and the risk of self-destructive deaths. As noted in a comment by Cutler, Case and Deaton's suggestion that deaths of despair are driven by *"economic and social breakdown … is very much in the tradition of Émile Durkheim (1897)"* (Case and Deaton, 2017, p. 445). According to the Durkheimian perspective, the rise in the broader category of deaths of despair is likely rooted in erosion of the social structure that bonds individuals together within a society.

Social structure is governed by two central dimensions: integration and regulation. Although Durkheim never elaborated these dimensions, subsequent scholars conceptualized integration as the structural element of social relationships that captures the degree to which an individual maintains ties with members of society (Berkman et al., 2000; Pescosolido, 1990), while regulation involves the extent to which its members' attitudes or behaviors are guided by collective moral directives and sanctions (Abrutyn and Mueller, 2014, 2016). As individuals become more enmeshed within the structure, they may feel a greater sense of collective belonging and purpose in their lives (Mueller et al., 2021). As noted by Durkheim (1897), when moral or social institutions deteriorate, individuals may lack the meaning and order imposed by clear social expectations, which could fuel self-destructive behaviors such as suicide.

For deaths of despair, one relevant structural factor is employment status. Durkheim might have pointed to the regulative effect of work to explain the importance of employment status for deaths of despair. Work is a central way that individuals establish social status, connect with broader social networks, and gain a sense of purpose (Christiansen, 1999; Hill and Weston, 2019). Both individual-level (Gutin and Hummer, 2020; Olfson et al., 2021) and aggregate-level studies (Dalphonse et al., 2024) suggest that unemployment is associated with deaths of despair. The rise in deaths of despair followed a decline of labor market opportunities for high-school educated Americans since the early 1970s (Cherlin, 2014). Reeves and Stuckler (2016) argue that rising unemployment involves both disintegration—"because it cuts people off from a particular social world" (p. 42); that is, it weakens "the quantity and quality of social ties" (Abrutyn and Mueller, 2014, p. 329)—and deregulation—because it obscures "the norms and sanctions governing those ties" (Abrutyn and Mueller, 2014, p. 329).

Given Durkheim's emphasis on integration, another key structural factor is social integration, encompassing marriage/family, religion, and community/civic involvement. The downfall of the "blue collar aristocracy" affected not only employment, but also traditional social structure (Case and Deaton, 2017, p. 429). The literature highlights growing educational disparities in marriage rates, declines in traditional religious practices, and increasing social isolation (Case et al., 2020; Case and Deaton, 2017; Cherlin, 2014). For example, marriage and family structures in the US have changed profoundly over the past half century with declining marriage rates (Curtin and Sutton, 2020), a rise in non-traditional family structures, including single-parent households (Hemez and Washington, 2021), and smaller family sizes (US Census Bureau, 2023). Surveys have documented a recent decline in church attendance and a rise in the percentage of Americans identifying as religiously unaffiliated (Pew Research Center, 2015, 2019). These shifts may leave individuals with fewer social ties and looser social control and norms, potentially rendering them vulnerable to self-destructive behaviors.

Durkheim was not concerned with the subjective appraisals of individuals who committed suicide, so his theory does not explain *how* macro-level social forces cause individual-level self-destructive behaviors, such as suicide. Building on Durkheim's work, contemporary sociologists have outlined the micro-level mechanisms through which cognitive appraisals lead to suicide (Mueller et al., 2021). They suggest that cultural and structural contexts may cause individuals to feel that they are not performing their identities as expected. Individuals develop identities and learn about others' expectations through social relationships. When individuals fail to meet others' or their own expectations (about who they are and what they are supposed to do), they may experience negative social emotions, such as embarrassment, guilt, shame, worthlessness, or hopelessness (Mueller et al., 2021; Scheff, 1988). These emotions can accumulate over time, overwhelming an individual's cognitive adjustment and behavioral functions, leading to self-destructive behaviors (Abrutyn and Mueller, 2014).

Taken together, recent sociological theories on emotions, identity, and suicide provide a theoretical framework for understanding how structural factors might be linked with deaths of despair through distress. It underscores the importance of examining the social roots of deaths of despair. Based on the literature, we focus on two structural factors: 1) employment status; and 2) social integration, which incorporates marriage, contact with family and friends, religious attendance, and other social group meetings. *We hypothesize that employment status and social integration will be more strongly associated with drug/alcohol/suicide mortality than other causes of death (**Hypothesis 2**).*

## 2. Methods

### 2.1. Data

The data came from Waves 1–3 of the Midlife in the United States (MIDUS) study (see Supplemental Appendix A, Section A1 for details regarding sampling). The initial interview was completed by 7108 respondents at Wave 1 (1995-96). At Wave 2 (2004-06), 4963 from the original cohort were re-interviewed and 592 new respondents were added from a Milwaukee sample. At Wave 3 (2013-17), 3683 (3294 from the original cohort and 389 from the Milwaukee sample) were re-interviewed. We excluded from analysis 49 decedents for whom the cause of death was unknown. Our analytic sample included 7080 respondents from Wave 1, 5541 interviewed at Wave 2, and 3676 interviewed at Wave 3, yielding a total of 16,297 observations across the 3 waves.

### 2.2. Measures

#### 2.2.1. Mortality

Vital status as of December 31, 2021 was ascertained through searches of the National Death Index, survey fieldwork, and longitudinal sample maintenance (Ryff et al., 2022). Cause of death was coded by the National Center for Health Statistics from the death certificate (see Appendix Section A2 for details regarding mortality follow-up and cause of death coding).

In order to maximize statistical power, we defined deaths as a "death of despair" ($N = 74$) if any of the multiple contributing causes was related to drugs/alcohol/suicide. We categorized the remaining deaths into five groups based on the single underlying cause: 1) other external causes ($N = 58$); 2) smoking-related deaths (which included selected cancers, bronchitis, emphysema, and chronic airway obstruction, $N = 249$); 3) other cancers ($N = 358$); 4) cardiovascular disease (CVD, $N = 542$); and 5) a residual category of all other causes ($N = 429$).

#### 2.2.2. Key predictors

We used time-varying covariates (i.e., values were updated at Waves 2 and 3) for the key predictors: psychological distress, perceived economic distress, employment status, and social integration. **Psychological Distress** was measured using the Composite International Diagnostic Interview Short Form (CIDI-SF) scale for major **Depression**

and an index of **Negative Affect** (which included negative emotions such as feeling sad or hopeless; see Appendix Section A3 for details about measure construction, reliability, and validity where relevant). Some emotions (e.g., hopeless, worthless) included in the measure of negative affect seem more consistent with the notion of "despair" as it is discussed in the literature than the CIDI-SF depression instrument, which does not ask about hopelessness and only inquires about worthlessness if the respondent meets the screening criteria for depression or anhedonia. A common theme in the deaths of despair literature is loss of hope (Copeland et al., 2020; Stein et al., 2017) and increasing hopelessness or worthlessness (Case and Deaton, 2017; Cherlin, 2018; Copeland et al., 2020; Kleijn et al., 2016; Scutchfield and Keck, 2017; Shanahan et al., 2019). This literature also mentions pessimism (Copeland et al., 2020; Shanahan et al., 2019) or limited expectations for the future (Blanchflower and Oswald, 2020; Copeland et al., 2020; Shanahan et al., 2019).

**Perceived Economic Distress** was measured with an index based on five items related to subjective economic distress (see Appendix Section A4 for details regarding construction and reliability). **Employment status** at each wave was grouped into three categories: currently employed (reference group), retired, and neither employed nor retired. **Social Integration** was measured using the Berkman-Syme Social Network Index (SNI, see Appendix Section A5 for details) (Berkman and Syme, 1979).

To facilitate comparisons of effect size, we standardized the continuous/ordinal variables (depression, negative affect, economic distress, and social integration) to have a mean of 0 and a SD of 0.5. As explained by Gelman (2008), this alternative standardization method makes the effect size comparable with that of an untransformed, equally-distributed binary predictor (which would have a SD of 0.5). The hazard ratio for these standardized variables represents a comparison of one SD above versus one SD below the mean. We also reverse-coded social integration so that the direction of the effect is the same for all key predictors.

#### 2.2.3. Potential confounders

We controlled for potential confounders that could influence perceptions of distress, employment status, and/or social integration and are known to be associated with mortality. Sociodemographic confounders comprised age, sex, and educational attainment (see Appendix Section A6 for details). Age was treated as a time-varying covariate. Sex and educational attainment were measured only at baseline (i.e., Wave 1 for the original cohort, Wave 2 for the Milwaukee sample). Failing to control for these sociodemographic confounders would likely result in biased estimates for our key predictors.

In auxiliary models, we included additional time-varying measures of physical health status as a potential confounder (e.g., ill health could affect employment status, social integration, perceptions of distress, and mortality). These measures included four chronic conditions that are among the leading causes of death in the US (cancer, heart trouble, diabetes, lung problems) and an index of physical limitations (see Appendix Section A7 for details). The causal ordering of physical health relative to our key predictors is complicated: although we suspect physical health is a confounder (as noted above), it is also possible that earlier histories of employment, social integration, and distress affected the respondent's current physical health (i.e., health could be a mediator rather than confounder). Therefore, we included these covariates only in a final auxiliary model, which allows the reader to evaluate the results before and after adjusting for health status. We cannot determine whether chronic health conditions and physical limitations were a cause or a consequence of employment, social integration, and psychological or economic distress, all of which are measured simultaneously at each survey wave. We suspect that the true causal effect of our key predictors on drug/alcohol/suicide mortality lies somewhere in between the two sets of estimates.

### 2.3. Analytic strategy

We used multiple imputation to handle missing data (Rubin, 1996; Schafer, 1999); see Appendix Section A8 for details. We first examined descriptive statistics for covariates categorized by outcome (survived, death of despair, died of other external causes, etc.) at the end of observation.

Then, we fit Cox hazard models to test associations between key predictors and cause-specific mortality, using age as the time metric to estimate age-specific mortality. A robust variance estimator was used to correct for family-level clustering. For each cause-specific model, the observation was censored if: a) the respondent died of some other cause; or b) s/he survived to the end of follow-up.

In addition to age, all models controlled for sex and education. In the first set of models, we tested the key predictors individually: depression (Model 1); negative affect (Model 2); perceived economic distress (Model 3); employment status (Model 4); and social integration (Model 5). Then, we fit a fully-adjusted model that included employment status, social integration, and negative affect. In preliminary analyses, we included all three distress measures (i.e., depression, negative affect, and economic distress) in the model; none of them was significant for deaths of despair, but negative affect had the strongest association. Therefore, we included only negative affect in the final model.

We also fit several auxiliary models to test the robustness of the results to alternative specifications. First, we restricted the analytic sample to respondents who completed the self-administered questionnaire (SAQ) and refit the models testing the key predictors that came from the SAQ (i.e., negative affect, perceived economic distress, three of the four components of the SNI), which were imputed for those who did not complete the SAQ. Second, we refit the fully-adjusted model using the *underlying* cause of death to define deaths of despair ($N = 47$) rather than using multiple causes (which, as noted above, yielded $N = 74$ deaths of despair). Finally, we fit an additional set of fully-adjusted models that further controlled for various measures of physical health status as potential confounders.

We tested the proportionality assumption for each of the covariates (in a full model that included all three distress measures, employment, social integration, and health status). The hazard ratio (HR) varied significantly by age for the following covariates: education (for smoking-related mortality), depression (for residual mortality), employment status (for CVD mortality), cancer (for other cancer mortality), heart trouble (for CVD and residual mortality), diabetes (for other external causes and residual mortality), and physical limitations (for residual mortality). Thus, the final models included interactions between age and those covariates for specified cause-specific outcomes.

Statistical tests were two-sided at the 0.05 level. All analyses were conducted using Stata 18.0 (StataCorp).

## 3. Results

Among 7672 respondents in the analysis sample, there were 1706 deaths by December 31, 2021 (mean follow-up: 20.0 years, range: 8.0–26.9 years); the youngest death occurred at age 30 and the oldest at age 99. Those who died of despair were, on average, younger (mean 61.4) than survivors (mean 64.0) and decedents from other causes (mean ranged from 71.1 for other external causes to 77.7 for the residual category; see Supplemental Appendix Table B1).

Among the time-varying covariates (Appendix Table B2), the percentage of respondents who were neither employed nor retired was consistently highest for those who died of despair. Mean scores on the reverse-scored SNI were highest for those who died of despair. Differences in levels of psychological distress (depression scale or negative affect) were less consistent, but generally highest for those who eventually died of despair. Perceived economic distress was also highest, on average, at all waves for those who died of despair.

### 3.1. Hazard models testing key predictors individually

Table 1 shows results from the hazard models that individually tested the key predictors controlling only for sociodemographic characteristics. Depressive symptoms were significantly associated with the risk of dying of despair (Model 1, HR = 1.66 for one SD above vs. one SD below the mean, 95% CI 1.17–2.37), but there was a similar association with other external mortality (HR = 1.84 for ±1 SD, 1.18–2.86). Similarly, negative affect (Model 2, HR = 2.24 for ±1 SD, 1.59–3.14) and perceived economic distress (Model 3, HR = 2.13 for ±1 SD, 1.32–3.44) were associated with deaths of despair.

Model 4 revealed large HRs for employment status in the rate of deaths of despair. Compared with those who were currently employed, retired individuals (HR = 4.51, 2.13–9.55) and those who were neither employed nor retired (HR = 4.63, 2.49–8.58) exhibited much higher risk of dying of despair.

In Model 5, the SNI (reverse-coded) was also strongly associated with deaths of despair (HR = 3.42 for ±1 SD, 2.12–5.52), which was stronger than for any other type of mortality (i.e., confidence interval (CI) did not overlap with the point estimate for any other type of mortality). When we included the four individual components of the SNI (Supplemental Appendix D), the HRs in the model predicting deaths of despair were significant only for marriage, contact with family and friends, and participation in other social group meetings, while the HR for religious service attendance was weaker and not significant. However, the CIs were wide and overlapped with the point estimates for most other mortality outcomes. Thus, we did not find strong evidence that any of the individual components were more strongly associated with dying of despair than other types of mortality. Among the most consistent differences was for marriage: married respondents were less vulnerable to dying of despair (HR = 0.44, 0.27–0.72), but being married was not significantly associated with the risk of mortality from other external causes (HR = 1.11, 0.62–2.01) and the inverse association appeared to be weaker for other cancers (HR = 0.75, 0.60–0.94) and the residual category (HR = 0.76, 0.61–0.93).

### 3.2. Fully-adjusted hazard models

In the fully-adjusted model (Table 2), which simultaneously included employment status, the SNI (reverse-coded), and negative affect, all three variables remained significantly associated with the risk of dying of despair, although the HRs were attenuated compared with the models presented in Table 1. A Wald test revealed that the association with retirement (HR = 3.95, 1.91–8.16) was significantly stronger ($p$~0.03) than the association with negative affect (HR = 1.60 for ±1 SD, 1.11–2.29). However, the difference between the coefficients for neither employed nor retired (HR = 3.31, 1.71–6.41) and negative affect was only marginally significant ($p$~0.09). Similarly, the difference between the coefficients for the SNI (HR = 2.85, 1.78–4.55) and negative affect was only marginally significant ($p$~0.06).

The HRs for employment status and the SNI remained substantially larger than for many other types of mortality. For example, the lower limits of CI for the SNI in the model predicting deaths of despair was consistently higher than the point estimates for all other outcomes except smoking-related mortality (Table E1). In the case of employment status, the associations were stronger for deaths of despair than for other external causes, smoking-related, and other cancer mortality.

With adjustment for employment and the SNI, the association with negative affect was weaker but remained significant and similar in magnitude for deaths of despair (1.60 for ±1 SD, 1.11–2.29) and many other mortality outcomes (e.g., HR = 1.52 for ±1 SD, 1.25–1.84 for CVD mortality). However, the CI for negative affect in the model predicting deaths of despair overlapped with the point estimate for all the other types of mortality.

Fig. 1 shows the estimated percentage dying of despair between age 25 and 65 (based on the fully-adjusted model) for selected levels of the key predictors. Differences in the estimated percentage dying of despair were larger for employment status (2.0% for individuals who were neither employed nor retired versus only 0.6% for currently employed) and the SNI (1.9% for low versus 0.7% for high social integration) than for negative affect (1.2% for high versus 0.8% for no negative affect).

### 3.3. Sensitivity analyses

First, we refit Models 2 (negative affect), 3 (economic distress), and 5 (SNI) from Table 1 with the analysis sample restricted to respondents who completed the SAQ; the results remained similar (Appendix Table F1). Second, when we defined deaths of despair based only on the *underlying* cause of death, the association with negative affect was stronger (HR = 1.83, 95% CI 1.20–2.78) than when we used all contributing causes (HR = 1.60, 1.11–2.28; Table 2). In contrast, the associations were somewhat weaker for employment status (for retired: HR = 3.41, 1.29–9.03 vs. HR = 3.95, 1.92–8.16; for neither employed nor retired: HR = 2.85, 1.33–6.11 vs. HR = 3.31, 1.71–6.41) and the reverse-coded SNI (HR = 2.68, 1.54–4.65 vs. HR = 2.85, 1.78–4.55). Finally, we further adjusted for time-varying measures of health status (Appendix Table F2). The HRs for employment status were somewhat weaker, but remained substantial and significant for deaths of despair.

**Table 1**
Hazard ratios from Cox models predicting age-specific mortality by cause group, predictors entered individually adjusted for sociodemographic characteristics.[a]

| | Deaths of Despair | Other External Causes | Smoking-Related Causes | Other Cancers | CVD | All Other Causes |
|---|---|---|---|---|---|---|
| Model 1: Depression[b] | 1.66** | 1.84** | 1.73*** | 1.35** | 1.28* | 0.91 |
| Model 2: Negative affect[b] | 2.24*** | 1.57 | 1.97*** | 1.36** | 1.72*** | 1.72*** |
| Model 3: Perceived economic distress[b] | 2.13** | 1.09 | 2.12*** | 1.26* | 1.84*** | 1.61*** |
| Model 4: Employment status | | | | | | |
| *(Currently employed)* | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Retired | 4.51*** | 1.23 | 1.58** | 1.43* | 3.72*** | 2.02*** |
| Neither employed nor retired | 4.63*** | 1.91 | 1.71* | 1.20 | 4.33*** | 2.90*** |
| Interactions with (Age-50): | | | | | | |
| Retired × (Age-50) | | | | | 0.96** | |
| Neither employed nor retired × (Age-50) | | | | | 0.97** | |
| Model 5: SNI (reverse-coded)[c] | 3.42*** | 1.66 | 1.98*** | 1.43** | 1.47*** | 1.41** |

CVD = Cardiovascular disease; SNI = Social Network Index.
Note: In cases where there was evidence of non-proportional hazards, we interacted the relevant variable with Age-50 so that main effect represents the hazard ratio (HR) at age 50. See Supplemental Appendix C for full regression results for these models.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.
[a] Each of the five predictors are entered individually in a separate model adjusted for sex and education.
[b] HR represents the relative hazard for one SD above vs. one SD below the mean.
[c] The SNI was reversed-coded (i.e., higher values indicate less social integration); HR represents the relative hazard for one SD above (i.e., low integration) vs. one SD below (i.e., high integration) the mean.

**Table 2**
Hazard ratios from Cox models predicting age-specific mortality by cause group, fully-adjusted.

| | Deaths Of Despair | Other External Causes | Smoking-Related Causes | Other Cancers | CVD | All Other Causes |
|---|---|---|---|---|---|---|
| Employment status | | | | | | |
| *(Currently employed)* | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Retired | 3.95*** | 1.17 | 1.48* | 1.39* | 3.59*** | 1.90*** |
| Neither employed nor retired | 3.31*** | 1.69 | 1.39 | 1.10 | 3.53*** | 2.58*** |
| Interactions with (Age-50): | | | | | | |
| Retired × (Age-50) | | | | | 0.961** | |
| Neither employed nor retired × (Age-50) | | | | | 0.973* | |
| SNI (reverse-coded)[a] | 2.85*** | 1.55 | 1.83*** | 1.39** | 1.35*** | 1.31* |
| Negative affect[a] | 1.60* | 1.40 | 1.76*** | 1.28* | 1.52*** | 1.54*** |

CVD = Cardiovascular disease; SNI = Social Network Index.
Note: In cases where there was evidence of non-proportional hazards, we interacted the relevant variable with Age-50 so that main effect represents the hazard ratio (HR) at age 50. For example, in the model predicting CVD mortality, the HR for retired at age 50 was 3.59. The corresponding HR for age $x$ can be obtained as follows: $HR^{Retired} \times \left(HR^{Age \times Retired}\right)^{(x-50)}$, where $HR^{Retired}$ is the HR for the main effect and $HR^{Age \times Retired}$ is the HR for the interaction with age. Thus, the HR for retired at age 85 is: $3.59*0.961^{35} = 0.89$. See Supplemental Appendix E for full regression results for these models.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.
[a] HR represents the relative hazard for one SD above vs. one SD below the mean.

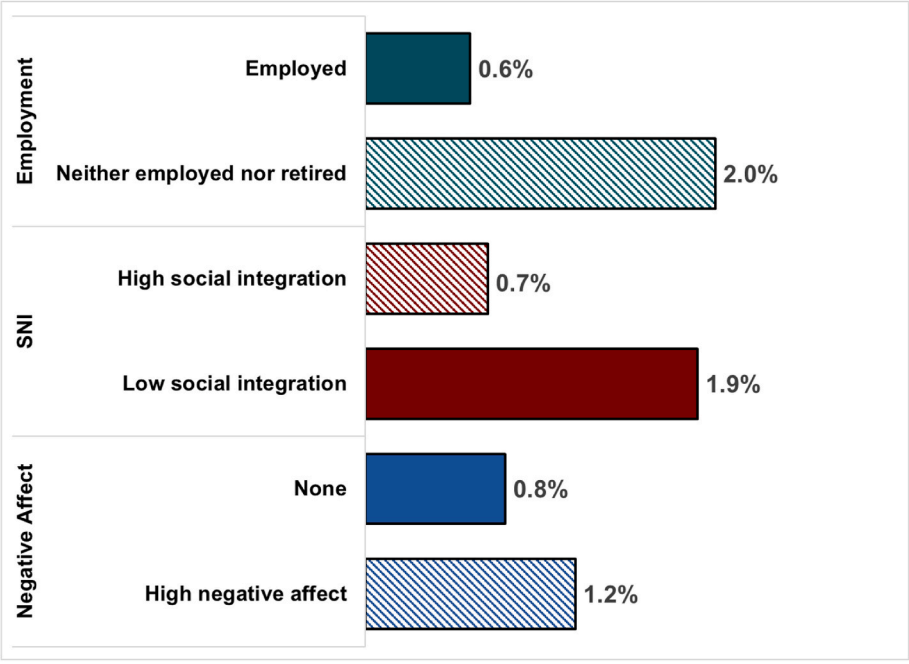


**Fig. 1.** Estimated percentage dying of despair between age 25 and 65 for selected levels of key predictors. SNI=Social Network Index. Estimates are based on the fully-adjusted model (shown in Supplemental Appendix Table E1) where each key predictor is set to the specified value and all other covariates are set at the sample mean. Among the working age respondents (25–64), 78% were employed, 7% were retired, and 15% were neither employed nor retired; we do not show estimates for those who were retired as such young ages. For the SNI and negative affect, we show estimates for observed values closest to one SD above vs. one SD below the mean. In the case of the SNI, we define high integration as a score of 3 out 4 (which was 0.58 SD above the mean; 45% of our sample scored 3–4 on the SNI) and low integration as a score of 1 out of 4 (which was 1.24 SD below the mean; 24% of our sample scored 0–1 on the SNI). For negative affect, we show estimates for those who reported no negative affect (0.86 SD below the mean; comprised 26% of our sample) and those who scored an average of 1.18 out of 4 (which was 1.01 SD above the mean and represented the 87th percentile).

There was little change in the HRs for the SNI. In contrast, the association with negative affect was weaker after adjusting for health status and no longer significant for any type of mortality.

## 4. Discussion

Although we found a significant association between psychological/economic distress and the risk of dying of despair, structural factors (i.e., employment status and social integration) were more consistently associated with drug/alcohol/suicide mortality even after adjusting for physical health status. In contrast, the associations between psychological/economic distress and dying of despair were modest, became even weaker after adjusting for employment status and social integration, and were reduced to non-significance after controlling for physical health status. Thus, most of the association between distress and dying of despair appeared to be a result of confounding with structural factors and with pre-existing physical health conditions that may influence both the perception of distress and mortality risk.

Overall, our findings provided stronger support for Hypothesis 2 than for Hypothesis 1. There was limited evidence for our first hypothesis that psychological/economic distress was more strongly associated with mortality related to drugs/alcohol/suicide than mortality from other causes. In fact, the associations with negative affect were nearly as strong for CVD and residual mortality as it was for deaths of

despair. In contrast, the association with social integration was stronger for drug/alcohol/suicide mortality than for all other outcomes, except perhaps smoking-related mortality. In the case of employment status, the association was stronger for deaths of despair than for mortality related to other external causes, smoking, or other cancers.

To our knowledge, no prior study has evaluated whether distress is associated with the risk of dying of despair. One study modeled the relationship between negative affect and all-cause mortality in an attempt to estimate mortality attributable to psychological distress, but that study did not directly investigate the association with drug/alcohol/suicide mortality (Zheng and Choi, 2024).

Our results for employment status are consistent with prior work showing that working-age adults who were not employed had higher rates of dying of despair (Gutin and Hummer, 2020; Olfson et al., 2021) and with an aggregate-level analysis demonstrating an association between state-level unemployment rates and deaths of despair (Dalphonse et al., 2024).

We are not aware of any prior investigations of the association between social integration and deaths of despair. Although research has demonstrated that married individuals exhibited lower mortality rates from deaths of despair (Gutin and Hummer, 2020; Olfson et al., 2021), our results highlight the importance of contact with family and friends and participation in other social groups for the risk of drug/alcohol/suicide mortality.

As noted in the introduction, individuals develop their identities, social connections, and sense of purpose in the context of social institutions. Studies suggest that loss of social and familial roles and ties as a result of life events (e.g., unemployment, retirement, or widowhood) are related to diminished sense of purpose (Hill and Weston, 2019; Lee et al., 2023). Individuals with less purpose in life were more likely to misuse drugs (Kim et al., 2020), possibly because of emotional dysregulation (Wupperman, 2019). As highlighted in the Surgeon General's advisory (Office of the Surgeon General, 2023), Americans have become less socially connected over time and are spending less time on in-person social engagement, which may help to explain increases in deaths of despair. Between 1960 and 2022, the percentage of Americans living alone increased from 13% to 29% of all households (US Census Bureau, 2022). Many indicators of community involvement also declined since the 1970s in the US (Office of the Surgeon General, 2023). For example, membership in a church, synagogue, or mosque declined from 70% of US adults in 1999 to 47% in 2020 (Jones, 2021).

Although some of the deaths of despair literature focuses solely on non-Hispanic White Americans, we believe it would be a mistake to restrict our analysis to Whites. Deaths from drugs/alcohol/suicide are a tragedy regardless of the decedent's race. Indeed, it is now clear that drug/alcohol/suicide mortality is rising more rapidly in Blacks than Whites (Friedman and Hansen, 2024). Compared with Whites, deaths of despair among Americans aged 45–54 are now slightly higher among Blacks and 2.4 times higher among Native Americans (Tanne, 2024).

As documented by Hansen et al. (2023), marketing of the opioid Oxycontin served to "whitewash" (p. 5) addiction, while buprenorphine emerged as a "white, middle-class treatment for opioid use disorder, as its advocates distinguished it from methadone and from punitive responses to opioid dependence (p. 160)."

Siddiqi et al. (2019) hypothesized that rising midlife mortality is not solely a result of declining economic circumstances, but rather it is "attributable to (false) perceptions of Whites that they are losing social status (p. 1)." Consistent with Siddiqi et al. (2019), our results reveal that factors typically related to social status threat (lack of employment) and diminished social ties are associated with deaths of despair. However, our analysis cannot evaluate their hypothesis directly because we are not investigating the predictors of *changes over time* in mortality, do not have an adequate measure of status anxiety, and lack sufficient statistical power to conduct race-stratified analyses.

The evidence presented here provides little support for the hypothesis that deaths of despair are attributable to subjectively reported psychological or economic distress. Our results suggest that instead of focusing on some nebulous concept of "despair," it may be more fruitful to interrogate underlying structural factors (social and economic) that may contribute to drug/alcohol/suicide mortality, whether the victim acknowledges any sense of distress or not.

### 4.1. Limitations

Our study has several limitations. First, the weak association between distress and the risk of dying of despair could be partly a result of the lag between measurement of distress and the timing of death (up to 10 years).

Second, distress measures rely on the respondent's willingness to acknowledge distress, which is likely to vary across individuals. Structural factors may be more strongly associated with deaths of despair than subjective measures of distress in part because of greater inter-individual variability in subjective reporting. Further, individuals who struggle with substance use disorder and suicidal ideation tend to have difficulty identifying and disclosing their distress (Ghalehban and Besharat, 2011; Hemming et al., 2019). Is it a "death of despair" even if the individual is unable or unwilling to admit distress?

Third, statistical power is limited by the rarity of deaths of despair. That is why most of the literature on this topic is based on aggregate-level mortality rates. However, our data provide information about the role of individual-level factors (e.g., distress, social integration) that cannot be obtained from the death certificate.

Fourth, we have grouped deaths of despair into a single category. Psychological distress may be more tightly linked with suicide than with unintentional deaths related to substance abuse.

Fifth, associations between psychological distress and mortality could be a result of endogeneity (e.g., pre-existing health problems could affect perceptions of distress as well as the risk of mortality). For example, people who know they are dying of cancer or CVD may be depressed about it. In the fully-adjusted models, we found that the association with negative affect was of similar magnitude for deaths of despair, smoking-related mortality, CVD mortality, and the residual category, but once we controlled for various measures of health status, the association with negative affect was much weaker and no longer significant. This result suggests that a large share of the association with negative affect may be a result of confounding with pre-existing health conditions. That may be especially notable for mortality related to disease.

Finally, as with any survey, results are subject to selection biases resulting from non-response and survey attrition. For example, if psychologically distressed individuals were less like to participate in the survey and experienced higher rates of drug/alcohol/suicide mortality than participants, our results may underestimate the association between psychological distress and deaths of despair.

### 4.2. Implications for future research and policy

A potentially fruitful avenue for future research would be to investigate the association between psychological/economic distress and drug/alcohol/suicide mortality using more frequent measures of distress. It would also be helpful to explore individual-level predictors of drug/alcohol/suicide mortality among a larger sample with sufficient statistical power to enable researchers to explore whether the associations vary by more detailed causes of death (unintentional drug vs. unintentional alcohol vs. suicide) and by social group (e.g., sex, race). For example, employment might be more strongly associated with deaths of despair among non-Hispanic Whites, who are more socially privileged, because discrimination against minorities constrains their access to high-paying jobs with good benefits and links to broader social networks. Similarly, the association between marriage and lower rates of drug/alcohol/suicide mortality might be stronger for men than women if men obtain more social support from their spouse than

women. Future studies could explore other ways of measuring despair and whether that construct overlaps with Durkheim's concept of anomie or the notion of macro-level social disintegration.

In terms of recommendations for clinical practice, policy, and possible interventions, our findings imply that it may be more effective to target structural factors (e.g., employment stability, social integration) that influence midlife mortality rather than focusing solely on subjective distress. Prescribing an anti-depressant may not ameliorate the underlying social problems that heighten the risk of drug/alcohol/suicide mortality. Policies that promote job security may have social (and mental health) benefits that extend beyond financial well-being. Civic involvement also has obvious benefits for individuals as well as society. For those with substance abuse disorders, addiction recovery centers and 12-step programs often promote community involvement (e.g., support groups, volunteer work, positive social relationships, recovery homes) as a valuable tool for recovery. Building on Bourdieu's (1986) concept of social capital, some theorists define Recovery Capital as the internal and external resources that may help individuals overcome addiction (Cloud and Granfield, 2008; Granfield and Cloud, 1999).

## 5. Conclusions

We found little evidence that psychological or economic distress were strongly associated with deaths related to drugs/alcohol/suicide. In contrast, detachment from the labor force and low social integration were both strongly associated with dying of despair, more than for many other types of mortality. They are "deaths of despair" in the sense that they result from self-destructive behavior, but our results suggest that structural factors may be more important determinants than subjective distress.

## Ethical statement

All procedures were performed in compliance with relevant laws and institutional guidelines. The MIDUS study was approved by the Educational and Social/Behavioral Science institutional review board at the University of Wisconsin, Madison [#2016-1051 for the survey, approved 11/22/2016; #2022-1609 for mortality follow-up, approved 12/19/2022]. Written, informed consent was obtained from all participants.

## CRediT authorship contribution statement

**Dana A. Glei:** Writing – original draft, Visualization, Software, Methodology, Formal analysis, Conceptualization. **Chioun Lee:** Writing – review & editing, Writing – original draft, Conceptualization. **Casey L. Brown:** Writing – review & editing, Conceptualization. **Maxine Weinstein:** Writing – review & editing, Supervision, Project administration, Funding acquisition, Conceptualization.

## Declaration of competing interest

None.

## Data availability

All the data used in this analysis are publicly available from ICPSR (https://www.icpsr.umich.edu/web/ICPSR/series/203 xlink:role="http://www.elsevier.com/xml/linking-roles/research-data").

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.socscimed.2024.117197.

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