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## Regular Research Article

# Life-Weariness, Wish to Die, Active Suicidal Ideation, and All-Cause Mortality in Population-Based Samples of Older Adults

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## ABSTRACT

**Objectives:** To investigate potential differences in the strength of associations between different levels of passive and active suicidal ideation and all-cause mortality in older adults. **Design:** Prospective cohort study. **Setting:** Population-based samples of older adults in Gothenburg, Sweden. **Participants:** Older adults aged 79 and above who participated in any wave of the Gothenburg H70 Birth Cohort Studies or the Prospective Population Study of Women between 1986 and 2015 ( $n = 2,438$ ; 1,737 women, 701 men; mean age 86.6). **Measurements:** Most intense level of passive or active suicidal ideation during the past month: life-weariness, wish to die, or active suicidal ideation. The outcome was all-cause mortality over 3 years. **Results:** During follow-up, 672 participants (27.6%) died. After adjustments for sex, age, and year of examination, participants who reported a wish to die (HR 2.01; 95% CI 1.55–2.60) as the most intense level of ideation, but not participants who reported life-weariness (HR 1.40; 95% CI 0.88–2.21) or active suicidal ideation (HR 1.10; 95% CI 0.69–1.76) were at increased risk of all-cause mortality. Reporting a wish to die remained associated with mortality in a fully adjusted model, including somatic conditions, dementia, depression, and loneliness (HR 1.70; 95% CI 1.27–2.26). **Conclusion:** In older adults, reporting a wish to die appears to be more strongly associated with all-cause mortality than either life-weariness or active suicidal ideation (Am J Geriatr Psychiatry 2022; ■■■:■■■–■■■)

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**Highlights**

- What is the primary question addressed by this study?
- Are different levels of passive and active suicidal ideation differently associated with all-cause mortality in older adults?
- What is the main finding of this study?
- A wish to die, but neither life-weariness nor active suicidal ideation was associated with increased all-cause mortality.
- What is the meaning of the finding?
- A wish to die may be a more important marker of mortality risk than other levels of suicidal ideation in older adults.

**OBJECTIVE**

Suicidal ideation can be conceptualized as varying along a continuum,<sup>1</sup> from life-weariness (feeling that life is not worth living), to a wish to die, to thoughts of actively ending one's life (active suicidal ideation). Different forms of suicidal ideation have been associated with all-cause mortality. A wish to die or active suicidal ideation was associated with a 35% increase in mortality in an Australian population sample of older adults.<sup>2</sup> The increased risk was attenuated to 23% after adjusting for demographics, physical and mental health at baseline. Similar results were found in a recent Irish study on adults over the age of 50.<sup>3</sup> In a clinical sample of middle-aged veterans from the United States, the higher all-cause mortality among suicide ideators was not explained by differences in physical or mental health, nor by differential suicide rates.<sup>4</sup>

Studies that have shown associations between suicidal ideation and mortality have defined suicidal ideation in various ways: Life-weariness, a wish to die, or active suicidal ideation,<sup>5</sup> life-weariness or active suicidal ideation,<sup>6</sup> wish to die,<sup>3,7–10</sup> wish to die or active suicidal ideation,<sup>2</sup> and active suicidal ideation.<sup>4,11</sup> Research comparing levels of passive or active suicidal ideation in their association with all-cause mortality is scarce. Skoog et al.<sup>5</sup> found that 85-year-olds with life-weariness or a wish to die had increased mortality but not those with active ideation, but only 15 participants reported active ideation in that study. Raue et al.<sup>10</sup> found no difference in mortality between participants with a wish to die and

participants with a suicidal desire, but only 13 participants reported a suicidal desire. Shiner et al.<sup>4</sup> found a non-significant tendency of higher all-cause mortality with increasing intensity of suicidal ideation, but only 23 participants reported the most intense level.

As previous research is inconclusive, further investigation of the association between suicidal ideation and mortality might shed more light on mechanisms. While it is possible that there is a dose-response relationship, with higher mortality as the severity of suicidal ideation increases, various types of ideation might be differentially associated with mortality, in a non-ordinal manner. We aimed to investigate this in a large, population-representative sample of older adults. A secondary aim was to examine possible confounders. We hypothesized that the highest mortality would be observed among those with the most severe suicidal ideation. Further, we hypothesized that differential mortality rates would be partly accounted for by demographic and psychosocial factors, and mental, and physical health.

**METHODS****Sample**

We drew participants, 79 years and older, from all examination waves of the Gothenburg H70 Birth Cohort Studies and the Prospective Population study of Women between 1986 and 2015 (Fig. 1). Examination procedures have been extensively described previously.<sup>12,13</sup> Briefly, we invited persons living in both private households and in institutions, who

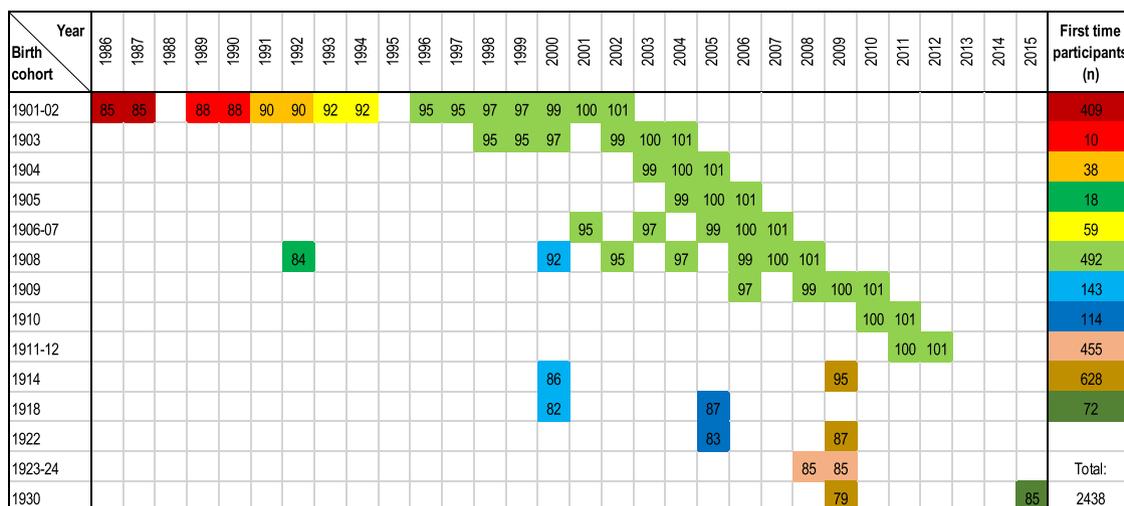
were born on specific days each month, yielding a systematic population sample. Participation rates varied between 57.9% and 73.4% across waves.<sup>14,15</sup> Eleven examination waves, including 3,264 unique participants aged 79 years or older, took place between 1986 and 2015. For participants who had more than one examination (e.g. examined at ages 79 and 85) we utilized data from the first examination. Three hundred eighty-three participants lacked data on the Paykel questions at their baseline examination, and a further 443 lacked data on covariates, leaving 2,438 participants (1,737 women, 701 men). Participants were born between 1901 and 1930 and were between 79 and 101 years of age (mean 86.6, SD: 6.1) at baseline. To yield a similar follow-up time for all participants, we censored follow-up at 3 years past their first examination. Death dates were retrieved on 04-20-2021 from the Swedish Tax Agency.

**Measures**

The psychiatric interview included the Paykel questions<sup>1</sup> which consists of five questions of increasing intensity that assess passive suicidal ideation of two forms (life-weariness and a wish to die) as well as active suicidal ideation: 1) Have you ever felt that life was not worth living? 2) Have you ever wished that you were dead – for instance, that you could go

to sleep and not wake up? 3) Have you ever thought of taking your own life, even if you would not really do it? 4) Have you ever reached the point where you seriously considered taking your own life, or perhaps made plans on how you would go about doing it? 5) Have you ever made an attempt to take your own life? In case of a positive response to any of these questions, the participant was asked about the last time this occurred (past week, past month, past year, or longer than a year ago). For the main analysis, we categorized responses into three levels based on the most intense passive or active suicidal ideation experienced during the past month: *Life-weariness* (positive response to question 1, but not to question 2–5), *wish to die* (positive response to question 2, but not to question 3–5), *active suicidal ideation* (positive response to any of questions 3–5). For a sensitivity analysis, we categorized responses in the same manner, for any point in life (any of: past week, past month, past year, or longer than a year ago). The suicide item on the Montgomery Åsberg Depression Rating Scale (MADRS)<sup>16</sup> was also applied. The response options for that item are: 0) Enjoys life or takes it as it comes. 2) Weary of life. Only fleeting suicidal thoughts. 4) Probably better off dead. Suicidal thoughts are common, and suicide is considered a possible solution, but without specific plans or intention. 6) Explicit plans for suicide when there is an opportunity. Active

**FIGURE 1. Included cohorts and examination waves.**



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preparations for suicide. Levels 1, 3, and 5 are mid-points between the other options. We categorized levels 0–1 as no suicidal ideation, 2–3 as passive ideation, and 4–6 as active ideation. Loneliness was assessed by the interviewer asking whether the participant felt lonely. Responses “never”, “seldom” and “sometimes” were regarded as not lonely while “often” was regarded as lonely. As this question was not included in two of the examination waves, for these waves we instead examined responses to the following two questions: Have you felt lonelier during the past 5 years due to functional decline or deaths of relatives? Do you find it hard to be alone? A participant with an affirmative response to either of these questions was regarded as lonely.

### Diagnosics

Dementia was diagnosed as described previously<sup>17</sup> based on the Diagnostic and Statistical Manual of Mental Disorders, revised third edition (DSM-IIIIR).<sup>18</sup> Major and minor depression were diagnosed according to research criteria in the text-revised DSM-IV.<sup>19</sup> Information on somatic conditions (myocardial infarction, fracture of the hip, diabetes) was retrieved during the interviews by the interviewer asking the participant whether a nurse or a doctor ever had informed them that they had any of those conditions. In case of missing data on somatic conditions from the participant, information from close informants was used. Cause of death data were retrieved from the Swedish Cause of Death Register. We considered the underlying cause and categorized based on Swedish versions of ICD-9<sup>20</sup> or ICD-10<sup>21</sup> codes: Cancer (140-208 or C00-C97); Respiratory disorders (460-519 or J00-J99); Ischaemic heart disease (410-414 or I20-I25); Stroke (430-438 or I60-I69); Dementia (290-294/330-337 or F00-F03); Suicide (including uncertain suicides) (E950-E959/E980-E989 or X60-X84/Y10-Y34).

### Statistical Analysis

We used Pearson  $\chi^2$  to test for group differences in proportions. We employed the Spearman rank-order correlation coefficient to test correlation between ordinal data. p-values were two-tailed and considered significant <0.05. We used Kaplan-Meier curves to plot survival by level of passive/active suicide ideation and Cox regression models to calculate Hazard Ratios

(HRs) with 95% confidence intervals (CI) for mortality. Passive/active suicidal ideation was entered as a categorical variable with no passive/active suicidal ideation as reference. We conducted three models: 1) including sex, age, and examination year, 2) adding somatic conditions (history of myocardial infarction, history of hip fracture, diabetes) and dementia, and 3) adding also loneliness, and depression status (no/minor/major) as a categorical variable with no depression as reference. The proportional hazards assumption was tested by calculating Schoenfeld residuals; no obvious violations were found. In sensitivity analyses, we reran Cox regression models a-c using highest level of lifetime ideation. Further, we reran model a (using past month ideation) stratified by age category, and stratified by decade of examination. Finally, we ran models a-c above replacing levels based on the Paykel questions with levels based on the MADRS suicide item. Four participants had missing data on the MADRS suicide item and were excluded in this analysis. All statistical analyses were performed with IBM SPSS Statistics for Windows (Version 25), except for Schoenfeld residuals which were calculated in StataCorp. 2015. *Stata Statistical Software: Release 14*. College Station, TX: StataCorp LP.

## RESULTS

Of all participants, 240 (9.8%) reported some type of passive or active suicidal ideation during the past month. A wish to die was most frequently the highest level reported (Table 1). Within three years of the baseline examination, 672 participants (27.6%) had died. Of those, 102 (15.2%) had reported any level of passive/active suicidal ideation at the baseline examination. Passive/active suicidal ideation tended to be more prevalent in older age categories, in earlier examinations, among women, among participants with a history of hip fracture, among participants with dementia, among those with minor or major depression, and among those who felt lonely (Table 1). The most common cause of death was ischaemic heart disease (22.5%), followed by cancer (14.4%), stroke (10.4%), respiratory disorders (7.9%), and dementia (4.5%). No participant died by suicide. Causes of death did not differ significantly by level of passive/active suicidal ideation (Pearson  $\chi^2$  (df: 15): p = 0.876) (Supplementary material, Table S1).

**TABLE 1. Characteristics of Participants at Baseline Examination in Population-Based Samples of Older Adults, by Most Intense Level of Passive/Active Suicidal Ideation Reported During the Past Month**

	Total n	No Passive or Active Suicide Ideation n (%)	Life-Weariness n (%)	Wish to Die n (%)	Active Suicide Ideation n (%)	df	p <sup>a</sup>
All	2438	2198 (90.2)	63 (2.6)	132 (5.4)	45 (1.8)		
Sex						3	<b>0.006</b>
Men	701	652 (93.0)	13 (1.9)	22 (3.1)	14 (2.0)		
Women	1737	1546 (89.0)	50 (2.9)	110 (6.3)	31 (1.8)		
Age groups						6	<b>&lt;0.001</b>
79-84	853	810 (95.0)	18 (2.1)	19 (2.2)	6 (0.7)		
85-94	1091	948 (86.9)	38 (3.5)	82 (7.5)	23 (2.1)		
95+	494	440 (89.1)	7 (1.4)	31 (6.3)	16 (3.2)		
Decade of baseline examination						9	<b>&lt;0.001</b>
1980s	414	340 (82.1)	18 (4.3)	42 (10.1)	14 (3.4)		
1990s	220	188 (85.5)	11 (5.0)	17 (7.7)	4 (1.8)		
2000s	932	852 (91.4)	11 (1.2)	50 (5.4)	19 (2.0)		
2010s	872	818 (93.8)	23 (2.6)	23 (2.6)	8 (0.9)		
History of myocardial infarction						3	0.745
No	2180	1963 (90.0)	59 (2.7)	118 (5.4)	40 (1.8)		
Yes	258	235 (91.1)	4 (1.6)	14 (5.4)	5 (1.9)		
History of hip fracture						3	<b>&lt;0.001</b>
No	2062	1883 (91.3)	50 (2.4)	98 (4.8)	31 (1.5)		
Yes	376	315 (83.8)	13 (3.5)	34 (9.0)	14 (3.7)		
Diabetes						3	0.414
No	2171	1955 (90.1)	54 (2.5)	119 (5.5)	43 (2.0)		
Yes	267	243 (91.0)	9 (3.4)	13 (4.9)	2 (0.7)		
Dementia						3	<b>0.007</b>
No	1973	1798 (91.1)	48 (2.4)	93 (4.7)	34 (1.7)		
Yes	465	400 (86.0)	15 (3.2)	39 (8.4)	11 (2.4)		
Depression status							<b>&lt;0.001</b>
No depression	1862	1789 (96.1)	30 (1.6)	30 (1.6)	13 (0.7)		
Minor depression	390	326 (83.6)	17 (4.4)	39 (10.0)	8 (2.1)		
Major depression	186	83 (44.6)	16 (8.6)	63 (33.9)	24 (12.9)		
Loneliness						6	<b>&lt;0.001</b>
No	2245	2073 (92.3)	51 (2.3)	99 (4.4)	22 (1.0)		
Yes	193	125 (64.8)	12 (6.2)	33 (17.1)	23 (11.9)		

<sup>a</sup> Pearson  $\chi^2$ 

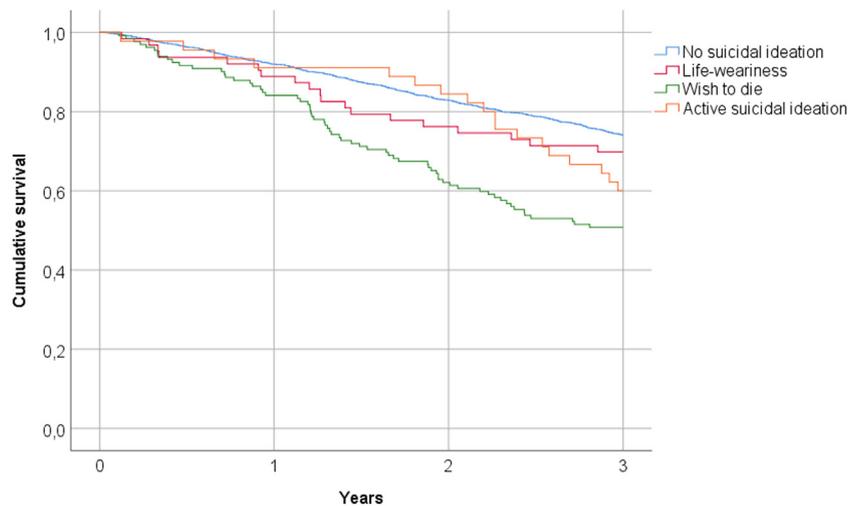
As illustrated in [Figure 2](#), participants who reported a wish to die had the lowest survival. Adjusted for age, sex, and examination year ([Table 2](#), model a), only a wish to die was associated with increased mortality. The hazard ratio for a wish to die compared to no ideation was slightly attenuated after including somatic conditions and dementia (model b). In the final model (c) that included also major and minor depression and loneliness, the hazard ratio was further attenuated, although still significantly elevated.

### Sensitivity Analysis

Replacing level of ideation during the past month with highest level during lifetime in the Cox regression ([Supplementary material](#), [Table S2](#)), attenuated

the hazard ratios for wish to die somewhat, but did not change the overall pattern. In Cox regressions by age category ([Supplementary material](#), [Table S3](#)), a wish to die was associated with mortality in age categories 85–94 and 95+, but not in those under 85 years. Both life-weariness and a wish to die were associated with mortality in those examined in the 1980s. Only a wish to die was associated with mortality in those examined in the 2000s and the 2010s. Active suicidal ideation was not associated with mortality in any decade or age category ([Supplementary material](#), [Table S4](#)).

As responses on the MADRS suicide item and most intense level of ideation based on the Paykel questions differed somewhat (Spearman correlation coefficient 0.69,  $p < 0.001$ ), we reran Cox regression models

**FIGURE 2.** Kaplan-Meier plot of survival by most intense level of passive/active suicidal ideation reported during the past month, in population-based samples of Swedish older adults (n = 2,438).

a-c replacing the exposure variable with one based on the MADRS question. Passive suicidal ideation (MADRS levels 2–3) was associated with mortality in models a–c with successively attenuated hazard ratios (Supplementary material, Table S5). Active suicidal ideation (MADRS levels 4–6) was not associated with mortality in any model.

## CONCLUSION

Contrary to our hypothesis of a dose-response relationship, only a wish to die was associated with all-cause mortality, after taking age, sex, and examination year into account. Although the hazard ratio was attenuated, a wish to die was still associated with a 70% increased risk of all-cause mortality compared to no ideation in the fully adjusted model including somatic conditions, dementia, depression, and loneliness. Results were corroborated by sensitivity analyses using an alternate measure of suicidal ideation, indicating that passive suicidal ideation was associated with mortality, while active suicidal ideation was not. Results were also corroborated by examining lifetime levels of suicidal ideation, with a wish to die conferring increased risk of mortality.

Our findings might seem somewhat counterintuitive as passive suicidal ideation is often considered

less severe than active suicidal ideation, for example in suicide assessment scales.<sup>22</sup> However, the clinical importance of passive suicidal ideation has been underlined in previous research. Szanto et al.<sup>23</sup> found that among older adults with major depression, clinical presentation did not differ in those with passive versus active suicidal ideation. Baca-Garcia et al.<sup>24</sup> found, in a study on U.S. adults, that desire for death and suicidal ideation were associated with similar risk of lifetime suicide attempt. Studies on Swedish,<sup>25</sup> and U.S. older adults<sup>26</sup> have emphasized the importance of passive suicidal ideation as it seldom occurs in the absence of previous active suicidal ideation or current anxiety or depression. Further, a recent systematic review and meta-analysis found that passive and active suicidal ideation were associated with similar psychiatric morbidity and sociodemographic characteristics.<sup>27</sup>

There are several possible explanations for the increased mortality among persons who wish to die. Firstly, we note that no participant died by suicide. Perhaps the most intuitive explanation is that those who wish to die also have poor physical health. This partly explained the excess mortality in the previously mentioned Australian<sup>2</sup> and Irish<sup>3</sup> studies. Mirroring those results, we could see that the hazard ratio for a wish to die decreased, although only very slightly, after including somatic conditions in the

**TABLE 2. Cox Regression Models for Time to Death From all Causes Within 3 Years, in a Population Sample of Older Adults (n = 2,438), by Most Intense Level of Passive/Active Suicidal Ideation Reported During the Past Month**

	Participants n	Events n	Model a: Including Sex, Age, and Year of Examination.		Model b: Model a + Somatic Conditions <sup>a</sup> and Dementia		Model c: Model b + Minor and Major Depression and Loneliness	
			HR	95% CI	HR	95% CI	HR	95% CI
No ideation	2198	570	ref		ref		ref	
Life-weariness	63	19	1.40	0.88-2.21	1.35	0.85-2.14	1.21	0.76-1.93
Wish to die	132	65	2.01	1.55-2.60	1.96	1.51-2.54	1.70	1.27-2.26
Active suicide ideation	45	18	1.10	0.69-1.76	1.17	0.73-1.88	1.03	0.63-1.69
Total	2438	672						

<sup>a</sup> History of myocardial infarction, history of hip fracture, diabetes

model. There is of course a possibility of unmeasured and residual confounding, as our measurements of somatic health were limited. Another explanation is that a wish to die can be a symptom of depression, which is consistently associated with mortality,<sup>28</sup> a major part of which may be due to its causally reciprocal relation with ischaemic heart disease.<sup>29</sup> A study from the United States on older adults found that among those with minor or major depression, those who also wished to die had higher mortality, if receiving treatment as usual. This difference was not observed in those who were treated at centers randomized to having depression care managers who helped physicians optimize depression treatment.<sup>10</sup> This supports an explanation that some of the excess mortality in older adults with a wish to die may be due to inadequate treatment of depression. However, also those who wished to die in the absence of depression in that study were at increased risk of mortality, controlling for functional disability and smoking status. This is in line with our results where a wish to die was associated with mortality also after controlling for minor and major depression.

A further possibility is that a wish to die is associated with mortality due to associations with social determinants of health, such as social support and feelings of belonging.<sup>30,31</sup> We were able to partly control for this through perceived loneliness, which is associated with mortality in older adults.<sup>32</sup> However, a wish to die remained significant in the fully adjusted model. This remaining increased risk must then either be due to unmeasured or residual confounding, or due to one or several mechanisms, behavioral or biological, through which a wish to die shortens life.

Concerning causality between psychological states (such as a wish to die) and physical illness, Engel<sup>33</sup> suggested a psychological state he called the “giving up, given up”-complex, which may increase the risk of physical illness. This was based on observations that such a state often preceded physical illness. However, the direction of causality is not known, it is possible that undiagnosed physical illness presents as a negative psychological state. A Danish study suggested that mental stress may play a causal role in excess mortality based on a population-based study on bereavement. They found an increased risk of mortality, particularly during the first month after bereavement (HR 2.50; 95% CI 2.37–2.63), after

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controlling for demographic factors and physical and mental disorders.<sup>34</sup> As a wish to die may be perceived as stressful, this finding to some extent supports causality between a wish to die and death, although we cannot say if the mechanism is behavioral or biological. A further possibility is internalized ageism, which has been associated with premature mortality,<sup>35</sup> and also shown to weaken the will to live in older adults in an experimental setting.<sup>36</sup> It could be that a wish to die is an indicator of internalized ageism. If so, this has clear implications for intervention.

We cannot say why the mechanisms discussed above may only, or more strongly operate for those with a wish to die, and not for those with other types of suicidal ideation. Cause of death did not differ by type of ideation, but the study was underpowered for such an analysis. Although we adjusted for some measurements of physical health, it is still possible that persons with a wish to die are more physically ill than persons with life-weariness or active suicidal ideation.

Another question is whether our results are clinically meaningful. The 70% increased mortality in the present study for persons with a wish to die can be compared to the 23% increased risk for older adults with a wish to die or suicidal ideation in the previously mentioned Australian study.<sup>2</sup> The authors of that study found that the population attributable mortality risk for suicidal ideation/a wish to die was similar to that of depression. As we found an even higher hazard ratio for a wish to die, we argue that our results are clinically meaningful. Older adults who report a wish to die require careful clinical assessment, for instance regarding poor self-care or demoralization even if they do not present with the typical major depressive picture.

### Strengths and Limitations

Strengths of the study include the large and representative sample of the general older adult population in Sweden, the good response rate, and the comprehensive assessment of passive and active suicidal ideation.

Some limitations should be mentioned. First, fewer participants reported life-weariness and active suicidal ideation as highest level than who reported a wish to die as highest level. This might have underpowered the analyses in these groups. Although the difference in mortality between a wish to die and active ideation was fairly robust, the confidence

intervals for life-weariness and a wish to die had a larger overlap, in line with the sensitivity analysis employing the MADRS question, indicating a higher risk for passive ideation. Second, the frailest participants, with the highest risk of death, are more likely to have not participated, based on the previously published slightly higher mortality among non-participants in some,<sup>15</sup> but not all<sup>37</sup> of the samples included in this study. This may have led to an under-estimation of the association between passive/active suicidal ideation and mortality, as we expect this group to have a higher prevalence of suicidal ideation. Third, some of the data emanate from interviews carried out several decades ago and might therefore not be generalizable to today's older adults. We note, however, that the association between death wishes and mortality was observed across examination decades. Fourth, loneliness was based on different questions in some examination waves, which might have affected analyses of that factor. Fifth, depression diagnoses were not specific for geriatric depression. This may have underestimated the contribution of depression on mortality. Sixth, as we only had cross-sectional data, we were unable to investigate the potentially mediating effect of health-related behavior. It is possible that those who wish to die make less healthy decisions regarding lifestyle, seek less healthcare and adhere less to treatment. Also due to the cross-sectional nature of our data, we cannot examine how changes in suicidal ideation and depression over time might influence mortality. However, the sensitivity analysis using lifetime ideation instead of past month yielded similar results.

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### DATA STATEMENT

The data has previously been presented as a digital poster, to conference attendees, at the International Summit on Suicide Research in October 25-27, 2021. It has also been presented orally, to conference attendees, at the Swedish Psychiatry Conference in Stockholm, March 17, 2022.

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### AUTHOR CONTRIBUTIONS

MJ, RS, KAVO and MW designed this substudy. MW was main supervisor. IS designed the original

population study and supervised data collection. MJ and RS carried out the data analyses. MJ prepared the first draft of the manuscript. All authors contributed to data interpretation and manuscript preparation, and all have approved the final manuscript.

## DISCLOSURE

MW has received Textbook royalties from Liber Förlag and Studentlitteratur (three textbooks). She has also provided consultation regarding Suicide assessment scales for Jansen Pharmaceuticals, provided local, regional, and national education for care professionals and social workers, and also educational activities through NGOs (Gothenburg University was remunerated for these services). For the remaining authors no conflicts of interest were declared.

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## SUPPLEMENTARY MATERIALS

Supplementary material associated with this article can be found, in the online version, at <https://doi.org/10.1016/j.jagp.2022.10.003>.

## References

1. Paykel ES, Myers JK, Lindenthal JJ, et al: Suicidal feelings in the general population: a prevalence study. *Br J Psychiatry* 1974; 124:460-469
2. Batterham PJ, Calear AL, Mackinnon AJ, et al: The association between suicidal ideation and increased mortality from natural causes. *J Affect Disord* 2013; 150:855-860
3. Ragab I, Ward M, Moloney D, et al: 'Wish to die' is independently associated with cardiovascular mortality in later life. Data from TILDA. *Int J Geriatr Psychiatry* 2021; 36:1004-1010
4. Shiner B, Riblet N, Westgate CL, et al: Suicidal ideation is associated with all-cause mortality. *Mil Med* 2016; 181:1040-1045
5. Skoog I, Aevarsson O, Beskow J, et al: Suicidal feelings in a population sample of nondemented 85-year-olds. *Am J Psychiatry* 1996; 153:1015-1020
6. Fagerström C, Welmer AK, Elmståhl S, et al: Life weariness, suicidal thoughts and mortality: a sixteen-year longitudinal study among men and women older than 60 years. *BMC Public Health* 2021; 21:1359
7. Macdonald AJ, Dunn G: Death and the expressed wish to die in the elderly: an outcome study. *Age Ageing* 1982; 11:189-195
8. Ashby D, Ames D, West RC, et al: Psychiatric morbidity as predictor of mortality for residents of local authority homes for the elderly. *Int J Geriatr Psychiatry* 1991; 6:567-575
9. Dewey ME, Davidson IA, Copeland JR: Expressed wish to die and mortality in older people: a community replication. *Age Ageing* 1993; 22:109-113
10. Raue PJ, Morales KH, Post EP, et al: The wish to die and 5-year mortality in elderly primary care patients. *Am J Geriatr Psychiatry* 2010; 18:341-350
11. Khang YH, Kim HR, Cho SJ: Relationships of suicide ideation with cause-specific mortality in a longitudinal study of South Koreans. *Suicide Life Threat Behav* 2010; 40:465-475
12. Rinder L, Roupe S, Steen B, et al: Seventy-year-old people in Gothenburg. A population study in an industrialized Swedish city. *Acta Med Scand* 1975; 198:397-407
13. Bengtsson C, Ahlqvist M, Andersson K, et al: The prospective population study of women in gothenburg, sweden, 1968-69 to 1992-93. A 24-year follow-up study with special reference to participation, representativeness, and mortality. *Scand J Prim Health Care* 1997; 15:214-219
14. Fässberg MM, Vanaelst B, Jonson M, et al: Epidemiology of suicidal feelings in an ageing Swedish population: from old to very old age in the Gothenburg H70 birth cohort studies. *Epidemiol Psychiatr Sci* 2019; 1-14
15. Jonson M, Sigström R, Mellqvist-Fässberg M, et al: Passive and active suicidal ideation in Swedish 85-year-olds: time trends 1986-2015. *J Affect Disord* 2021; 290:300-307
16. Montgomery SA, Asberg M: A new depression scale designed to be sensitive to change. *Br J Psychiatry* 1979; 134:382-389
17. Skoog I, Nilsson L, Palmertz B, et al: A population-based study of dementia in 85-year-olds. *N Engl J Med* 1993; 328:153-158
18. American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders: DSM III-R. 3 ed Washington DC: American Psychiatric Association, 1987
19. American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders: DSM-IV TR. 4 ed Washington, DC: American Psychiatric Association, 2000

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20. National Board of Health and Welfare. Klassifikation av sjukdomar. 1987. Available at: <https://www.socialstyrelsen.se/globalassets/sharepoint-dokument/dokument-webb/klassifikationer-och-koder/icd9-ks87-inledning-1987.pdf> 1986.
21. National Board of Health and Welfare. Klassifikationen ICD 10. 2022. Available at: <https://www.socialstyrelsen.se/statistik-och-data/klassifikationer-och-koder/icd-10/>.
22. Posner K, Brown GK, Stanley B, et al: The Columbia-Suicide Severity Rating Scale: initial validity and internal consistency findings from three multisite studies with adolescents and adults. *Am J Psychiatry* 2011; 168:1266-1277
23. Szanto K, Reynolds CF 3rd, Frank E, et al: Suicide in elderly depressed patients: is active vs. passive suicidal ideation a clinically valid distinction? *Am J Geriatr Psychiatry* 1996; 4:197-207
24. Baca-Garcia E, Perez-Rodriguez MM, Oquendo MA, et al: Estimating risk for suicide attempt: are we asking the right questions? Passive suicidal ideation as a marker for suicidal behavior. *J Affect Disord* 2011; 134:327-332
25. Van Orden KA, Simning A, Conwell Y, et al: Characteristics and comorbid symptoms of older adults reporting death ideation. *Am J Geriatr Psychiatry* 2013; 21:803-810
26. Van Orden KA, O'Riley AA, Simning A, et al: Passive suicide ideation: an indicator of risk among older adults seeking aging services? *Gerontologist* 2015; 55:972-980
27. Liu RT, Bettis AH, Burke TA: Characterizing the phenomenology of passive suicidal ideation: a systematic review and meta-analysis of its prevalence, psychiatric comorbidity, correlates, and comparisons with active suicidal ideation. *Psychol Med* 2020; 50:367-383
28. Cuijpers P, Vogelzangs N, Twisk J, et al: Comprehensive meta-analysis of excess mortality in depression in the general community versus patients with specific illnesses. *Am J Psychiatry* 2014; 171:453-462
29. Stapelberg NJ, Neumann DL, Shum DH, et al: A topographical map of the causal network of mechanisms underlying the relationship between major depressive disorder and coronary heart disease. *Aust N Z J Psychiatry* 2011; 45:351-369
30. Fassberg MM, van Orden KA, Duberstein P, et al: A systematic review of social factors and suicidal behavior in older adulthood. *Int J Environ Res Public Health* 2012; 9:722-745
31. Cui R, Gujral S, Galfalvy H, et al: The role of perceived and objective social connectedness on risk for suicidal thoughts and behavior in late-life and their moderating effect on cognitive deficits. *Am J Geriatr Psychiatry* 2022; 30:527-532
32. Barnes TL, Ahuja M, MacLeod S, et al: Loneliness, social isolation, and all-cause mortality in a large sample of older adults. *J Aging Health* 2022:8982643221074857
33. Engel GL: A life setting conducive to illness. The giving-up-given-up complex. *Bull Menninger Clin* 1968; 32:355-365
34. Prior A, Fenger-Grøn M, Davydow DS, et al: Bereavement, multimorbidity and mortality: a population-based study using bereavement as an indicator of mental stress. *Psychol Med* 2018; 48:1437-1443
35. Rakowski W, Hickey T: Mortality and the attribution of health problems to aging among older adults. *Am J Public Health* 1992; 82:1139-1141
36. Levy B, Ashman O, Dror I: To be or not to be: the effects of aging stereotypes on the will to live. *Omega (Westport)* 1999; 40:409-420
37. Andersson M, Guo X, Börjesson-Hanson A, et al: A population-based study on dementia and stroke in 97 year olds. *Age Ageing* 2012; 41:529-533