

## PEER REVIEW HISTORY

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### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Mortality following unemployment during an economic downturn: Swedish register-based cohort study
<b>AUTHORS</b>	Montgomery, Scott; Udumyan, Ruzan; Magnuson, Anders; Osika, Walter; Sundin, Per-Ola; Blane, David

### VERSION 1 - REVIEW

<b>REVIEWER</b>	Urban Janlert Professor in Public Health Umeå University Sweden Competing interests: None.
<b>REVIEW RETURNED</b>	29-Apr-2013

<b>THE STUDY</b>	<p>The research question is formulated a little different in the abstract, the introduction and the title. The title talks about "unemployment in later working life", the abstract does not restrict the study to age or qualification, and the introduction talks about "a broader spectrum of the working population" which I interpret as unemployment among those that normally are not hit by unemployment (e.g. white collar workers).</p> <p>The participants are not patients (cf question 4 above) but they are representative for men in Sweden as I can see it. [It would be nice to rephrase the sentence so that also public health research could be included].</p> <p>There are a few publications about unemployment and how that will affect groups with different socioeconomic status which I think is the group in focus here (c.f. D'Arcy &amp; Siddique, Int J Health Serv 1985;15(4):609-35).</p> <p>I suppose a "no" answer on the last question requires no comment.</p>
<b>RESULTS &amp; CONCLUSIONS</b>	More or less, depending on which formulation of the research question you refer to.
<b>GENERAL COMMENTS</b>	<p>The title is a little complicated "... eliminates health potential associated with cognition and education...". Although formally correct, I could imagine that a more straightforward phrasing could be easier to understand for the reader.</p> <p>One problem is the point estimate of unemployment (which the authors acknowledge). A possibility to test a proxy for duration is to correlate unemployment during the first period with unemployment during the second. I cannot see that this has been done. If there is a strong correlation one possible explanation could be that it is the length of the unemployment, not the age, that explains the findings.</p>

<b>REVIEWER</b>	Anton Carl Jonas Lager, PhD, MPH Head of Unit, Surveillance and Analysis Centre for Epidemiology and Community Medicine Stockholm County Council Affiliated, Dep of Public Health Sciences, Karolinska Institutet  -I have no competing interests.
<b>REVIEW RETURNED</b>	23-May-2013

<b>THE STUDY</b>	<p>The objective is "to investigate if unemployment reduces health potential associated with higher cognitive function scores and qualifications".</p> <p>-The expression "health potentials" is vague.</p> <p>-"Reduces" to me suggests causation, but the study is purely observational.</p> <p>-All exposures and the outcome concerns men and women, but the study only includes women.</p>
<b>RESULTS &amp; CONCLUSIONS</b>	<p>The conclusion is that "unemployment at older ages may eliminate health potential associated with higher cognitive function and qualifications". In other words: once you're unemployed, it doesn't matter for health whether you have high IQ (and/or education) or not.</p> <p>But the mortality rates over IQ (and education) and employment status in Table 3 seem to suggest otherwise:</p> <p>The unemployed with high cognitive function have a mortality rate per 1000 person-years of 5.83 (95 % CI; 4.95-6.86) while the unemployed with low cognitive function have a mortality rate of 8.41 (7.55-9.38), i.e. a substantially higher rate.</p> <p>The unemployed with long education have a rate of 5.07 (4.19-6.13), but the unemployed with short education have a rate of 8.17 (7.34-9.10), again much higher</p> <p>In any case, to back up the statement that "unemployment at older ages may eliminate health potential associated with higher cognitive function and qualifications" you would expect results illustrating the association between IQ (and/or education) and health - over employment status (not association between employment status and health, over IQ (and education)).</p> <p>What the paper seems to suggest as it stand is rather "that unemployment at older ages is associated with mortality, irrespective of one's IQ and education" - but that is a quite different conclusion...</p>

## VERSION 1 – AUTHOR RESPONSE

Reviewer: Urban Janlert  
Professor in Public Health  
Umeå University  
Sweden

Competing interests: None.

REFEREE: The research question is formulated a little different in the abstract, the introduction and the title. The title talks about "unemployment in later working life", the abstract does not restrict the study to age or qualification, and the introduction talks about "a broader spectrum of the working population" which I interpret as unemployment among those that normally are not hit by unemployment (e.g. white collar workers).

AUTHORS: We have attempted to introduce greater consistency between the title, abstract and introduction. The title has been simplified to: Mortality following unemployment during an economic downturn: Swedish register-based cohort study. The Objective section of the abstract now makes the aims more specific about investigating age at unemployment during an economic downturn.

REFEREE: The participants are not patients (cf question 4 above) but they are representative for men in Sweden as I can see it. [It would be nice to rephrase the sentence so that also public health research could be included].

AUTHORS: The section on participants in the abstract now begins:  
A representative sample of men from the general population.....

REFEREE: There are a few publications about unemployment and how that will affect groups with different socioeconomic status which I think is the group in focus here (c.f. D'Arcy & Siddique, Int J Health Serv 1985;15(4):609-35).

AUTHORS: Thank you for the useful reference, this is now included, with the following sentences in the introduction:

This is consistent with the finding that psychological distress associated with unemployment was reported more frequently among white-collar than blue-collar workers.

And in the discussion:

Unemployment at an older age among the more highly qualified and those with higher cognitive function scores may represent a stressful exposure that is more unexpected or more difficult to cope with than unemployment experienced among men with fewer qualifications or lower cognitive function scores, as suggested by the higher levels of unemployment-related psychological distress observed among white-collar workers.

REFEREE: I suppose a "no" answer on the last question requires no comment. The title is a little complicated "... eliminates health potential associated with cognition and education...". Although formally correct, I could imagine that a more straightforward phrasing could be easier to understand for the reader.

AUTHORS: The title has been simplified to: Mortality following unemployment during an economic downturn.

REFeree: One problem is the point estimate of unemployment (which the authors acknowledge). A possibility to test a proxy for duration is to correlate unemployment during the first period with unemployment during the second. I cannot see that this has been done. If there is a strong correlation one possible explanation could be that it is the length of the unemployment, not the age, that explains the findings.

AUTHORS: We agree that this is potentially important. In fact we did attempt to tackle this, but may have failed to explain the approach sufficiently. We adjusted for previous unemployment in our analysis (which will serve to reduce associations with the current period if there is a strong association between earlier and current unemployment). The results of adjustment indicated that earlier unemployment did not explain the findings, particularly the higher relative mortality risk among the more intelligent and highly educated. To better explain and interpret this, we have added the following to the limitations section of the discussion:

There is a greater possibility of prior unemployment in the later period and thus greater unemployment duration, but our adjustment for previous unemployment did not indicate that this was driving the results.

Reviewer: Anton Carl Jonas Lager, PhD, MPH Head of Unit, Surveillance and Analysis Centre for Epidemiology and Community Medicine Stockholm County Council Affiliated, Dep of Public Health Sciences, Karolinska Institutet

-I have no competing interests.

REFeree: The objective is "to investigate if unemployment reduces health potential associated with higher cognitive function scores and qualifications".

AUTHORS: We have tried to make this clearer (see below).

REFeree:-The expression "health potentials" is vague.

AUTHORS: This has been replaced in the abstract by 'markers of better health' and the expression has also been altered in the introduction and discussion sections, as well as the article summary.

REFeree:-"Reduces" to me suggests causation, but the study is purely observational.

AUTHORS: The objective has been rewritten and now reads:  
To investigate if unemployment during an economic downturn is associated with mortality, even among men with markers of better health (higher cognitive function scores and qualifications), and to assess whether the associations vary by age at unemployment.

REFeree:-All exposures and the outcome concerns men and women, but the study only includes women.

AUTHORS: The study only includes men and we have strengthened the statement made by the first sentence of the limitations section in the discussion to say:  
Potential limitations of the study include its inclusion of only men, as women can also be affected

adversely by unemployment.

REFeree: The conclusion is that "unemployment at older ages may eliminate health potential associated with higher cognitive function and qualifications". In other words: once you're unemployed, it doesn't matter for health whether you have high IQ (and/or education) or not.

But the mortality rates over IQ (and education) and employment status in Table 3 seem to suggest otherwise:

The unemployed with high cognitive function have a mortality rate per 1000 person-years of 5.83 (95 % CI; 4.95-6.86) while the unemployed with low cognitive function have a mortality rate of 8.41 (7.55-9.38), i.e. a substantially higher rate.

The unemployed with long education have a rate of 5.07 (4.19-6.13), but the unemployed with short education have a rate of 8.17 (7.34-9.10), again much higher

In any case, to back up the statement that "unemployment at older ages may eliminate health potential associated with higher cognitive function and qualifications" you would expect results illustrating the association between IQ (and/or education) and health - over employment status (not association between employment status and health, over IQ (and education)).

What the paper seems to suggest as it stand is rather "that unemployment at older ages is associated with mortality, irrespective of one's IQ and education" - but that is a quite different conclusion..

AUTHORS: We have modified the conclusions (they are justified in part by the interaction analysis) of the abstract to say:

Unemployment at older ages is associated with greater mortality risk than at younger ages, with the greatest relative increase in risk among men with markers of better health, suggesting the greater vulnerability of all older workers to unemployment-associated exposures.

We have also modified the conclusion of the discussion section so that it is consistent with this interpretation.

Additionally, the 'article summary' section has been modified to reflect the improvement in describing how the findings should be interpreted, as well as replacement of the term 'health potential' with something less vague.