PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Not in Education, Employment, or Training (NEET) and risk of Alcohol use disorder – A nationwide register-linkage study with 485 839 Swedish youths
AUTHORS	Manhica, Helio; Lundin, Andreas; Danielsson, Anna-Karin

VERSION 1 – REVIEW

REVIEWER	Octavio Campollo University of Guadalajara, Mexico
REVIEW RETURNED	09-Aug-2019

GENERAL COMMENTS	Interesting study, elaborated research structure, wide national registers (data sets). Calls my attention the second and third limitations mentioned in the text. The authors investigated specifically UAD but not other mental or psychiatric disorders, particularly substance use disorder. In that sense tobacco use can be a variable that could tell us, indirectly, more about the subjects when there is no more mental health information which probable there is. There are variables other than the exposure variables selected that may be related or associated with AUD but they haven't been enough explored (or explained) and they might be present in the registers' data sets or already looked at by the authors. One of them is the one included as "origin". Studies by Medina Mora and Bourges among others, have reported the differences in alcohol and substance use between migrants, returned migrants, migrants' offspring and nationals. From appendix 1 it seems like the prevalence of AUD is slightly higher in migrant's offspring in all covariates but NEET. Would it be even higher if migrants' offspring and youth migrant were considered together? Did the authors develop an hypothesis on that? Are there differences regarding the variable "origin" in this study? Other factors that may be related to AUD like those cultural, family, peers, school development, school drop-outs, drug and substance use, law or criminal problems which by the way seems to have been studied by some of the authors, were not explored and could be not just a limitation but a major obstacle to reach conclusions. One more comment on the title, perhaps authors should considered include "insecure workforce" instead of NEET .

REVIEWER	Gina Martin Western University, Canada
REVIEW RETURNED	14-Aug-2019

GENERAL COMMENTS	This manuscript presents a nationwide linkage study and the statistical methods chosen are appropriate. However, my main critique of the paper is that the independent variable (alcohol use disorder-AUD) is misrepresented in many points of the paper. The study in fact examining the registration of a patient with AUD. Many people may be experiencing AUD without being registered in medical care and this should be more clearly outlined in the paper (including the title, results and discussion). I don't believe this is a fatal flaw in the paper, but this should be more clearly outlined throughout, and the discussion of the results should take this into consideration. For example, in the discussion the outcome AUD is said to reflect "help-seeking behaviours"; however, this is not the case for many of the classifications of AUD medical registrations. Moreover, the analysis not only looked at NEET individuals but also those who are in insecure employment. This again is not reflected in the title or in the objectives of the study (see abstract). Other points: For the exposure variable, does the Education classification earnings include parental contributions? This may impact the interpretations. The statistical analysis section would benefit from some rationales and citations. In the last paragraph of the discussion it is stated that youth in larger cities might face barriers to treatment. What evidence is there to support this statement? Are there less medical access in larger cities? This seems unlikely.

VERSION 1 – AUTHOR RESPONSE

Reviewer 1

1. Calls my attention the second and third limitations mentioned in the text. The authors investigated specifically UAD but not other mental or psychiatric disorders, particularly substance use disorder. In that sense tobacco use can be a variable that could tell us, indirectly, more about the subjects when there is no more mental health information which probable there is.

In relation to the second limitation, we stated that we did not consider information about other possible psychiatric disorders. Therefore, caution must be made in drawing definitive conclusions because the mental health status might be an important contributing factor for both poorer labor market outcome and alcohol misuse. The rationale for not including other disorders was mainly based on the fact that these are registered at the same time point as our outcome (AUD). Hence, we are not able to control our exposure – outcome association. We did exclude subjects with a prior AUD diagnosis as a means to examine to what extent being in NEET might affect the risk of subsequent AUD.

We agree with the reviewer that tobacco use could tell us more about our subjects. However, our register data does not have any information regarding tobacco use – only medical diagnoses.

2. There are variables other than the exposure variables selected that may be related or associated with AUD but they haven't been enough explored (or explained) and they might be present in the registers' data sets or already looked at by the authors. One of them is the one

included as “origin”. Studies by Medina Mora and Bourges among others, have reported the differences in alcohol and substance use between migrants, returned migrants, migrants’ offspring and nationals. From appendix 1, it seems like the prevalence of AUD is slightly higher in migrant’s offspring in all covariates but NEET. Would it be even higher if migrants’ offspring and youth migrant were considered together? Did the authors develop a hypothesis on that? Are there differences regarding the variable “origin” in this study?

We decided to separate young migrants from migrant offspring’s because they do not share similar risk factors of both labor market outcomes and AUD. Overall, population studies have confirmed that youth with migrant background face greater challenges in the labor market compared with their native peers. Among youth with migrant background, migrant offspring are less likely to face labor market disadvantages compared to their migrant peers, including those who arrived as children. In contrast, migrant offspring have better labor market advantages. This advantage have been explained by a better knowledge of the host country’s language, institutional rules and regulations, social networks and that they are less likely to face ethic discrimination in the Swedish labor market.

In relation to AUD, the majority of the youth migrant population in Sweden has a refugee background and they come from Muslim countries, where alcohol is culturally prohibited, especially for women. Religion and norms about alcohol intake formed in the migrant’s countries of origin might have a protective effect against the harmful use of alcohol. On the other hand, youth offspring’s of migrants might have attitudes concerning alcohol consumption rather similar to the native Swedish.

See the table below, where we show the relative risks between native Swedish, youth migrant offspring’s and youth migrants (Full adjusted model). We also carried out interaction analyses of origin and our exposure variable on the risk of AUD. We found no significant interaction effects of origin and our exposure variable on the outcome. (This was already mentioned in the method section, under statistical analyses, page 7.)

Table 1.
Cox regression models for first hospital admission/first visit to specialist care due to AUD, by level of employment attachment among youths (male and female) between 2009 and 2016. N = 485 839.

			HR 95% CI
Labour market attachment	N	AUD	Model
Core workforce	166 817	1 547	ref
Education	177 464	1 338	0.84 (0.78–0.90)
Insecure workforce	123 917	1 561	1.40 (1.30–1.50)
NEET	17 641	178	1.30 (1.11–1.51)
Origin			
Native Swedish	375 66	3 478	ref
Youth Migrants’ offspring	73 202	835	1.09 (1.01–1.17)
Youth migrant	36 804	310	0.69 (0.62–0.78)

AUD: Alcohol use disorder; CI: Confidence interval; HR: Hazard ratio; N: Population; NEET: Not in Education, Employment, or Training.
Model: adjusted for sex, age, domicile, and origin

We included one paragraph in the introduction, under the title “Youths and labour market attachment”. See page 3 and 4 (Introduction).

“Among youth with a migrant background, youth offspring of migrants are less likely to face labour market disadvantages compared to their migrant peers, including youths who arrived as children. This advantage have been explained by a better knowledge of the host country’s language, institutional rules and regulations, social networks and the fact that they are less likely to face ethic discrimination. Thus, in our study, we expect lower rates of labour market attachment among young migrants compared with native-born children of both immigrants and native Swedes”.

3. Other factors that may be related to AUD like those cultural, family, peers, school development, school drop-outs, drug and substance use, law or criminal problems which by the way seems to have been studied by some of the authors, were not explored and could be not just a limitation but a major obstacle to reach conclusions.

The major strength of this study is the use of national registers covering the entire population living in Sweden during the follow-up period. However, the use of registers has its own limitations, e.g. our registers cannot capture important variables such as cultural values, family relations and peers, etc. In relation to school development and school dropouts, this study only included youths who completed secondary education in Sweden, meaning that school dropouts were excluded. Youth who completed secondary education, and continued their education career are included in our exposure outcome. Furthermore, we also excluded individuals with previous history of AUD before the follow-up period.

Our study focuses on the consequences of being NEET - and not in the first place, on risk factors for ending up in NEET. NEET and AUD might share many risk factors (school, family, friends, etc.), which is why we also consider it justifiable to investigate whether these are also associated.

We have added the following sentence in the discussion section. See the forth limitation, last paragraph (Strengths and limitations) on page 12.

“Fourth, being in NEET and having an AUD might share many overlapping risk factors (school, family, friends, etc.), on which we had no information in this study. Hence, we are not able to explain the mechanisms that put an individual at greater risk of being in NEET. Our main focus, however, was on the possible consequences rather than the causes.”

We added a sentence in the conclusion calling for further investigations. See the last paragraph in the discussion section on page 12.

“Further studies are needed to explore the mechanisms underlying the associations between labor market disadvantages and AUD”.

4. One more comment on the title, perhaps authors should considered include “insecure workforce” instead of NEET.

The current study takes its point-of-departure in examining a possible association of NEET and alcohol use disorders. As stated in the introduction (4th paragraph), our main hypothesis is that youth who are outside education, employment, or training might have increased risks of subsequent AUD. However, our analyses (Table 2) suggest that the risks of AUD were higher in youth in insecure work force, following by NEET.

We have added our main hypotheses in the introductions section. See the first paragraph on page 5.

“It is hypothesized in the current study that AUD would be severely compounded among youth in NEET, as disengagement from the labour market tend to expose youths to a range of negative social and health consequences, including, the harmful use of alcohol”.

Reviewer: 2

1. This manuscript presents a nationwide linkage study and the statistical methods chosen are appropriate. However, my main critique of the paper is that the independent variable (alcohol use disorder-AUD) is misrepresented in many points of the paper. The study in fact examining the registration of a patient with AUD. Many people may be experiencing AUD without being registered in medical care and this should be more clearly outlined in the paper (including the title, results and discussion). I do not believe this is a fatal flaw in the paper, but this should be more clearly outlined throughout, and the discussion of the results should take this into consideration. For example, in the discussion the outcome AUD is said to reflect “help-seeking behaviors”; however, this is not the case for many of the classifications of AUD medical registrations.

We fully agree with the reviewer that many people may suffer from AUD without being registered. A hospital record due to alcohol related disorders implies serious problems related to alcohol misuse. If anything, however, this may have led to an underestimation of the actual problem.

We have addressed this issue in the limitation.
See the fifth limitation (Strength and limitations) on page 12.

“Fifth, caution needs to be taken in how these findings are interpreted because the outcome variable, hospital record due to alcohol related disorders, implies serious problems related to alcohol misuse. If anything, however, this may have led to an underestimation of the actual problem”.

2. Moreover, the analysis not only looked at NEET individuals but also those who are in insecure employment. This again is not reflected in the title or in the objectives of the study (see abstract).

The current study takes its point-of-departure in examining a possible association of NEET and alcohol use disorders. As stated in the introduction (4th paragraph), our main hypothesis is that youth who are outside education, employment, or training might have increased risks of subsequent AUD. However, our analyses (Table 2) suggest that the risks of AUD were higher in youth in insecure work force, following by NEET.

We have added our main hypotheses in the introductions section. See the first paragraph on page 5.

“It is hypothesized in the current study that AUD would be severely compounded among youth in NEET, as disengagement from the labour market tend to expose youths to a range of negative social and health consequences, including, the harmful use of alcohol”.

3. For the exposure variable, does the Education classification earnings include parental contributions? This may impact the interpretations.

No, the education classification earnings does not include parental contribution. This consists of grants and loans individuals get from the Swedish Board of Student Finance (CSN) to cover their costs while studying at a university, vocational college, municipal adult education, high school, upper-secondary school and other post-secondary education programmes. All Swedish students are entitled to this loan.

4. The statistical analysis section would benefit from some rationales and citations.

Indeed, this has been revised (See Statistical analyses, thought the page 7). In addition, we have added two references (See reference list on pages 15 and 16).

“Weitoft, G.R., et al., Mortality statistics in immigrant research: method for adjusting underestimation of mortality. International journal of epidemiology 1999;28:756-763.”

“Hosmer Jr, D.W., S. Lemeshow, and S. May, Applied survival analysis: regression modeling of time-to-event data. Wiley-Interscience 2008; 618.”

In the last paragraph of the discussion it is stated that youth in larger cities might face barriers to treatment. What evidence is there to support this statement? Are there less medical access in larger cities? This seems unlikely.

We fully agree with the reviewer that the last sentence might seem unlikely. We decided to reformulate the last paragraph. See third paragraph, page 11

“The fact that the risk was somewhat higher in youths living in medium-sized towns, and smaller towns/rural areas, than in those in larger cities, calls for further investigations. In fact, this study could not confirm the pattern found in other studies that living in smaller communities was associated with a lower proportion of heavy alcohol consumption and alcohol-related problems. One potential explanation for the geographical differences could be differences in local labour market (e.g., local youth labour market programmes) and selection into labour market participation”