Author’s response to reviews

Title: Gender differences and gender convergence in alcohol use over the past three decades (1984-2008). The HUNT Study, Norway

Authors:

Grete Bratberg (grete.bratberg@ntnu.no)

Sharon Wilsnack (sharon.wilsnack@med.und.edu)

Richard Wilsnack (richard.wilsnack@med.und.edu)

Siri Haugland (siri.h.haugland@uia.no)

Steinar Krokstad (steinar.krokstad@ntnu.no)

Erik Sund (erik.r.sund@ntnu.no)

Johan Bjørngaard (johan.h.bjorngaard@ntnu.no)

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Author’s response to reviews:

Authors’ response (cursive) to reviewer 1’s comments (blue text)

In the revised version of the manuscript, new text and new content are highlighted in yellow.

1. The focus on the Norwegian context should be briefly motivated in the revised introduction.

Authors’ response

We agree and have tried to include this as part of our framework, both in the introduction (page 5) and in the discussion (pages 15-17).

2. Is the data nationally representative or not? This should be stated in the description of the data. The revised version should state more facts about the external validity of the patterns that are documented in the paper.

Authors’ response

We agree that more emphasis should have been placed on the increasing decline in participation. Citizens living in Nord-Trøndelag County are considered to be fairly representative of
Norwegians, as we already have written in the discussion (page 20, paragraph 1). However, due to the substantial decline in participation over time, it is a question whether the responders have become less representative. In order to be more specific about this important issue, we have added some new references and tried to describe and discuss the attrition more properly -- in the methods section as well as in the discussion. Since most of the attrition in HUNT is due to the increasing “drop out” of younger and older people, possible sample selection is not a concern in all age groups. Participation rates among middle-aged men and women (50-79 years) have been fairly stable, and in HUNT3 as many as 68% of men and 74% of women aged 60-69 years participated in the study (Holmen, Krokstad).

Due to the lack of major cities, the drinking patterns may differ from those in the most urban parts of the country, but they are considered representative for most others and more rural parts (discussion, page 11, paragraph 1). More important perhaps, the overall change in drinking patterns in this county (our study) is also very much in concordance with findings reported in a previous studies based on national representative samples. We have added two more publications in the revised version (introduction, page2, paragraph 1). Unfortunately, only one of the surveys are published internationally and thus the language is Norwegian (English abstracts are available).

3. There is a substantial reduction in the response rate over the period (page 7). Is the decline identical for women and men? The potential difference between women and men may have some important implications for the interpretation of the time patterns that are presented in the paper. If persons for whom alcohol causes the most severe problems are increasingly less likely to respond the survey, the time patterns may also be biased at least to some degree.

Authors’ response

In order to measure change in gender differences, the attrition rates and causes for attrition should ideally be consistent and similar for both genders, but participation rates have declined more in younger men (20-39) than in women (20-39) and in the youngest men in particular (20-29). If the decline in younger men is associated with alcohol drinking as an outcome, estimates of change in gender differences may be biased. According to a previous non-response study (HUNT2) attrition was moderately associated with both abstaining and heavy drinking, but not considered a major cause of nonresponse after other characteristics were taken into account (Torvik).

Due to the substantial decline in participation rate in HUNT3, a thorough nonparticipation study, including data from 6922 non-responders (comparisons between responders and nonresponders linked to national registries) was conducted (Langhammer). Non-responders in general had (among other factors) lower socioeconomic status, higher mortality and higher prevalence of chronic disorders. The study gives no direct answer to the question of why more women than men responded in HUNT3. However, among those younger than 40 years of age, the main reasons in both genders were “had no time/ inconvenient” and “got no invitation”.
Of more importance, however, there were no differences in frequent drinking (i.e., 2-3 times a week or more often) between responding and non-responding men aged 20-39 years. According to the Langhammer study, lifestyle factors, including alcohol drinking, smoking and exercise, accounted for only a small fraction of the observed underestimation of a range of outcomes (e.g., morbidity and mortality) after taking socioeconomic status (SES) into account (higher in responders than in non-responders). In our study, we have used level of education as proxy for SES (as a confounding variable). We have also attached two figures (at the very back of this document) that show the educational level in HUNT, compared to the region and the country (national data) from H1 to H3 (only available for age group 30-39). The figures are not intended to be taken into the manuscript, but rates are discussed (page 23, paragraph 1).

Based on these non-responder studies we suggest that, although responders and non-responders in HUNT differ in some aspects, possible sample selection related to alcohol drinking seems to be of minor concern. We have described the attrition and outlined possible limitations in more detail in the methods (page 7, paragraph 1) and in the discussion (page 20-22).

4. Are the exactly the same conversion rules that are used on page 9 been applied in the earlier literature as well? The revised version should provide some relevant references to the prior studies.

Authors’ response

The recommended standard cut off is from the review of Dhalla and Kopec, and in the revised version this publication is correctly added as a reference (The CAGE Questionnaire for Alcohol Misuse: A Review of Reliability and Validity Studies (Page 9, paragraph 1).

5. Do the data contain multiple measures for binge drinking?

Authors’ response

Binge drinking was measured only in HUNT3.

6. The revised version could note that a full decomposition of the observed patterns into age, time and cohort effects is impossible without particularly strong structural assumptions about the effects. Age, time and cohort are linearly dependent. This implies that any time effect can always be interpreted as simultaneous cohort and age effects.

Authors’ response: We have noted this distinction (page 17, paragraph 2).

8. The discussion part should also provide some thoughts about the possible reasons for the changing patterns in drinking between women and men. Are there relevant changes in alcohol policy that should be noted in the discussion?

Authors’ response: See our response below.

Authors’ response to comments 8 and 9:

In order to limit the length of the revised paper, and the discussion in particular, we have chosen not to include more topics (e.g., practical policy lessons), but rather placed more emphasis on the Norwegian society and culture (see response to comment 1), of importance for contemporary changes in both alcohol drinking and gender convergence. We have also discussed the need for a new alcohol policy, as suggested by authors of a recent review (mostly Nordic countries) (yellow text page 15, 16 and 17). We hope these revisions have improved the paper.

Authors’ response (cursive) to reviewer 2’s comments (blue text)

In the revised version of the manuscript, new text and new content are highlighted in yellow.

This manuscript uses data from three large cross-sectional population health studies each separated by a decade to explore trends in alcohol use and abuse. The strengths of the study are the underlying stability of the population in the central Norwegian county, the large sample size, the twenty-year timespan, and a text that is, with a few exceptions, clearly and concisely written. The weaknesses, however, are substantial.

First, the response rate across the three waves was inconsistent and fell dramatically (34% fewer participants, 39% decline in response rate). The potential bias introduced by the declining participation needs to be discussed and it might prove informative if models adjusted for continuous age, age squared, education level and marital status were compared to unadjusted models.

Authors’ response

Overall representativeness

We agree that more emphasis should have been placed on the increasing decline in participation. Citizens living in Nord-Trøndelag County are considered to be fairly representative of Norwegians in general, as we already have written in the discussion (page 20, paragraph 1). However, because the decline in participation over time was substantial, it is an important question whether the responders have become less representative. In order to be more specific about this important issue, we have added some new references and tried to describe and discuss the attrition more properly, both in the methods section and in the discussion and the conclusions (abstract). Since most of the attrition in HUNT is due to the increasing “drop out” of younger and older people, possible sample selection is not a concern in all age groups. Participation rates among middle-aged men and women (50-79 years) have been fairly stable, and in HUNT3 as many as 68% of men and 74% of women aged 60-69 years participated in the study (Holmen, Krokstad).
Due to the lack of major cities in Nord-Trøndelag County, the drinking patterns in the HUNT surveys may differ from those in the most urban parts of the country (Oslo), but the patterns we found are considered representative for most others and more rural parts (discussion, page 11, paragraph 1). More important perhaps, the overall change in drinking patterns in this county (our study) is also very much in concordance with findings reported in two previous studies based on Norwegian samples. We have added two more publications in the revised version (introduction, page 2, paragraph 1). Only one of these studies are published internationally and thus the language is Norwegian (English abstracts).

Gender-specific representativeness and change

In order to measure change in gender differences, the attrition rates and causes for attrition should ideally be consistent and similar for both genders, but participation rates have declined more in younger men (20-39) than in women (20-39) and in the youngest men in particular (20-29). If the decline in younger men is associated with alcohol drinking as an outcome, estimates of change in gender differences may be biased. According to a previous non-response study (HUNT2) attrition was moderately associated with both abstaining and heavy drinking, but not considered a major cause of nonresponse after taking other characteristics into account (Torvik).

Due to the substantial decline in participation rate in HUNT3, a thorough nonparticipation study, including data from 6922 non-responders (comparisons between responders and non-responders linked to national registries) was conducted (Langhammer) was conducted (Langhammer). Non-responders in general had (among other factors) lower socioeconomic status, higher mortality and higher prevalence of chronic disorders. The study gives no direct answer to the question of why more women than men responded in HUNT3. However, among those younger than 40 years of age, the main reasons in both genders were “had no time/ inconvenient” and “got no invitation”.

Of more importance, however, there were no differences in frequent drinking (i.e., 2-3 times a week or more often) between responding and non-responding men aged 20-39 years. According to this study, lifestyle factors including alcohol drinking, smoking and exercise accounted for only a small fraction of the observed underestimation of a range of outcomes (e.g., morbidity and mortality) after taking socioeconomic status (SES) into account (higher in responders than in non-responders). In our study we have used level of education as a proxy for SES (as a confounding variable). We have also attached two figures (at the very back of this document) that show the educational level in HUNT, compared to the region and the country (national data) from H1 to H3 (only available for age group 30-39). The figures are not intended for the manuscript, but rates are discussed (page 23, paragraph 1).

Based on these non-responder studies we suggest that, although responders and non-responders in HUNT differ in some aspects, possible sample selection related to alcohol drinking seems to be of minor concern. We have described the attrition and outlined possible limitations in more detail in the methods (page7, paragraph 1) and in the discussion (page 20-22).

Second, not all measures were included in all waves of the survey. This diminishes the ability to identify trends. This limitation is not sufficiently discussed.
Authors’ response

We acknowledge that since some findings of change in this study were based on only two assessments and not three, the change in gender differences between the surveys do not necessarily represent trends of change. For example, the changes in consumption and problematic drinking between H2 and H3 are considered changes, but we cannot know if the change is part of a trend or a fluctuation. We have tried to delineate this distinction more clearly in the abstract (yellowed) and in the discussion section (page 22, paragraph 3).

Third, the convergence in drinking pattern between genders needs more discussion and for this it would appear necessary to go beyond the data in the survey. For instance, the authors neglect to consider the role of social structures. They might consider discussing where drinking is being done – either in domiciles where there are approximately equal numbers of men and women or at social gatherings in more gender-neutral locations such as restaurants or workplace situations versus in male dominated places such as bars or sporting venues. The role increasing social equality in the workplace and educational system might also be worth mentioning as a factor in the convergence.

Authors’ response

We do agree and have tried to improve the discussion of gender convergence in drinking as part of contemporary societal changes, and by emphasizing both contextual and cultural changes (highlighted in yellow). In order to limit the length of the revised paper and the discussion in particular, we have chosen not to include even more topics, but rather have placed more emphasis on characteristics of the Norwegian society. We have also discussed the need for a new alcohol policy as suggested by authors of a recent review (mostly Nordic countries). We hope these revisions have improved the paper and have met the reviewers’ expectations.

Finally, and perhaps most important, the authors report a trend over time of increased prevalence of problematic drinking but declining annualized volumes of alcohol consumption and drinking to intoxication. These outcomes appear to be contradictory. However, the first outcome is a lifetime measure; the latter two are based on recent drinking behaviors. This point needs to be more clearly made in the Abstract, Methods, and Discussion sections. And the authors need to discuss how the different time frames for outcome measures could produce divergent results.

Authors’ response

This final critique may be due to a misunderstanding, since both annual volume of alcohol consumed and the prevalence of problematic drinking have increased. The prevalence of intoxication, however, has declined. These changes are not contradictory since men and women apparently have started to drink more frequently (Horverak). Drinking has traditionally been part of social happenings during weekends, but has become increasingly more common on weekdays, and in far more contextual settings than before e.g., as part of meals. Drinking occasions may have become more frequent, but drinking to intoxication less frequent. Unfortunately, we were not able reliably to measure changes in the frequency of drinking since measurements differed so
much between surveys. We have, however, tried to be more explicit about these changes in the introduction (page 5 paragraph 1) as well as in the discussion (pages 15-17 yellowed).