Report to the
Alcohol Education and Rehabilitation Foundation

AER Foundation Ltd
Changing the way we drink

Organisation:	Turning Point Alcohol & Drug Centre Inc
Project Title:	Stability and change in women's alcohol consumption: Factors related to alcohol consumption in women from the Australian Longitudinal Study on Women's Health (ALSWH).
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The aims of the project were to:

(1) examine alcohol consumption in two cohorts of women;

(2) determine change in this consumption over time;

(3) identify any differences in (1) and (2) between the two cohorts;

(4) identify factors that affect the level of consumption across time and cohort;

(5) identify factors that affect change in alcohol consumption across the cohorts, and

(6) determine whether these factors are the same or different across cohorts and across time.

A comprehensive evaluation of the project results against the project objectives including comparison between the original proposal and the actual strategies and outcomes achieved;

As a consequence of new demands being placed upon the Australian Longitudinal Study on Women's Health (ALSWH), researcher's at the University of Newcastle by their funder's and their federal reporting requirements. As a consequence of these events we had to renegotiate the Memorandum of Understanding that had been established before the commencement of the project between Turning Point Alcohol and Drug Centre and ALSWH, gaining approval from their PSA committee (Publications, Sub studies and Analyses Committee at the University of Newcastle) in the process. This was a lengthy and detailed process.

Although the project aims remained largely intact, substantial time was lost conducting these negotiations. The six planned papers were also affected and had to be curtailed. In addition, results from many of the analyses were not as predicted: i.e. in relation to 'predictors of change', very few factors achieved statistical significance. Despite these extraneous influences, the project did address the initial six aims.

The First three aims were addressed in a series of analyses that examined alcohol consumption cross sectionally and longitudinally. These results were written up for peer review in a paper entitled "Alcohol consumption of Australian women: Results from the Australian Longitudinal Study on Women's Health". This was also presented at the Australian Professional Society on Alcohol and Drugs annual conference in Melbourne in 2005 as an oral presentation entitled "Stability and Change in women's alcohol consumption'.

It had been envisaged that more than one paper would have resulted from these analyses however the reality was that one paper was appropriate once all the analyses were complete. We considered the possibility of splitting the papers in line with the cohorts but presenting the three cohorts together gave a more thorough presentation and context. It should be noted that while the original analysis plan was to examine only the first two cohorts of women i.e. the young and middle cohort of the study, we were able to include the older cohort in this paper in collaboration with the ALSWH team at Newcastle University. While we did not have access to the older cohort data, analysis was conducted using the same methods and selection criteria as the two cohorts that we analysed.

As with aims 1-3 being amalgamated into one very detailed set of analyses and paper, so too did aims 4-6. Examining potential factors that impact on consumption and change in consumption were the focus. In these analyses alcohol consumption was examined using the short-term risk definition of five or more glasses of alcohol in one session. Selection of variables was guided by the literature though there is very little in the way of longitudinal analysis that examines change in alcohol consumption (see reference to extensive literature review below). Univariate analysis was conducted to determine predictors of decreasing and increasing short term risky drinking (over time) in both the young and middle cohort of women. Factors investigated included life events, social support, health status, family history of alcohol use, health behaviours, socioeconomic factors, work conditions, and family circumstance. Although many of these factors have been shown to be associated with risky drinking practices when examining impacts on change over time in either increasing or decreasing risky drinking behaviour none of these factors achieved statistical significance in predicting decreasing or increasing risky drinking practices.

It would be premature to state that these factors do not impact on alcohol consumption. Given that the project is secondary in nature and therefore we do not have control over the type of variables collected, it may be that these measures are not sensitive enough to detect change in alcohol consumption. Furthermore it may well be that our measure of alcohol consumption is not appropriate and that what is required is a clinical definition of problematic alcohol use such as that contained in the AUDIT or the CIDI, rather than an indicator of risky alcohol consumption. It may also be that the time change is too short to detect predictors. This could only be checked in future sweeps of the study, when the cohorts are older.

There is substantial focus especially in the press on the 'binge' drinking behaviour and practices of young people. We posed a new question to see if we could identify factors that predict the likelihood to cease short term risky drinking or 'bingeing' as it is referred to in the press. That is, can we predict what results in the cessation of short term risky drinking among the young and mid cohort of women? Results were unremarkable for the middle cohort, with several factors being identified for the young cohort. Significant factors included change in mental health, smoking cessation or non-smoker, non-normal BMI, change in socioeconomic circumstance and family formation. These analyses were presented at two conferences: International Harm Reduction Association in Belfast March 2005 and The Public Health Association of Australia in Perth September 2005. It is intended to write this analysis up for peer review journal submission.

An extensive systematic review that examined the non-biological factors related to women's alcohol use over time was also conducted. This review identified articles that had information on women's longitudinal use of alcohol and factors that were influencial. While here is a plethora of reviews on cross sectional analysis there is very little using longitudinal data and the majority are from the US and Europe. This analysis and eventual paper is in addition to those originally posed.

Analysis was also conducted to determine the difference between alcohol questions asked in a food frequency questionnaire and the quantity frequency measure. The first two sweeps of the middle cohort asked quantity frequency type alcohol questions, whereas in the third sweep the questionnaire was altered and asked in the food frequency questionnaire.

In contrast the young cohort were asked at the three time points the quantity frequency measures and the additional food frequency set of questionnaires at time three. We embarked on some analysis to determine whether the food frequency questions could be translated into the quantity frequency measure using the young data, and hopefully being able to impute data for the middle cohort third sweep. This unfortunately does not appear possible, there is poor concordance.

Finally, additional analyses were also undertaken for a methodological reason to determine if abstainers and low risky consumers were similar or different. The rational for this arose out of several studies combining the two groups. While univariate analysis suggests these groups are distinct, variance within the abstainer group would also be expected.

Recommendations based on the research findings that will address attitudinal and /or social impacts with a view to formulating policy change;

Analysis of the ALSWH data resulted in an increased understanding of stability and changes of women's alcohol consumption over an approximately ten-year time span. A comparison of a cross-sectional compared to longitudinal analysis revealed that cross-sectional analysis obscures much of the individual-level changes in alcohol consumption over time. For example, cross-sectional analysis in the younger cohort indicated a 1.4% decrease in long-term risky or high-risk consumption between 1996 and 2003. However, when examining intra-individual change, 2.9% of young women initiated long-term risky or high-risk consumption, 3.2% ceased this behaviour, and 2.1% had variable results over the time period. This ability to examine intra-individual change in consumption is the major benefit of a longitudinal design and is not possible in cross-sectional studies such as the National Health Survey or the National Drug Strategy Household Survey.

Unfortunately, analyses of factors expected to predict changes in consumption, were not as successful as anticipated. Very few significant factors (mental health status, health behaviours, drug use, employment status, family status and social support) were identified which predicted changes in women's alcohol consumption.

There are several reasons why this may have occurred.

- One possibility is that the quantity/frequency (QF) method used to collect alcohol consumption data in the ALSWH study and the corresponding translation into NHMRC risky drinking categories were not specific enough to capture changes in alcohol consumption resulting from some earlier exposure or experience. Other measures, such as the Composite International Diagnostic Interview (CIDI), that are based on clinical assessment and diagnostic criteria, may be better suited to analysis as an outcome and may have a more direct relationship to prior experiences.
- A second possibility is that the variables used to predict changes in alcohol consumption did not have the sensitivity or specificity to classify respondents by such complex constructs as "social network" and life events.
- A third possibility is that all factors examined are actually unrelated to alcohol consumption, although this would contradict a large body of alcohol literature.

The range of analyses conducted in the course of this project indicates that the ALSWH survey is not adequate to examine precursors to changes in alcohol consumption as defined by the NH&MRC classifications. A more basic limitation in using this study for the investigation of alcohol consumption in Australia is that it is limited to women whereas simultaneous investigation of men and women would be more effective for the purposes of alcohol investigations.

Based on the results from analysis of the ALSWH survey, the investigators recommend

- that the feasibility of a longitudinal study devoted to alcohol be investigated including the identification of funders', content areas and potential collaborators. The pervasiveness of alcohol use and the high social and health costs of alcohol misuse warrant this level of resource allocation. Such a designated study would be multidisciplinary to capture related conditions such as substance use, mental health, medical co morbidities and family history. A designated study would enable in-depth investigation of conditions such as alcohol use disorders and associated disabilities, the natural history of alcohol use disorders, treatment utilisation (both for alcohol and for medical or mental health conditions) and attitudinal and behavioural changes resulting from strategies to reduce alcohol consumption (eg changes to alcohol taxation or alcohol advertising).
- A second recommendation is that alcohol research be included as a primary component of the proposed Australian Longitudinal Study of Older People recommended by an independent committee of the Prime Minister's Science, Engineering and Innovation Council (PMSEIC, 2003). Such an alcohol component should collect detailed data regarding alcohol consumption, clinical measures of alcohol misuse, alcohol treatment history, etc and should include investigators from a variety of alcohol research content areas. The inclusion of a detailed alcohol component in a longitudinal study of ageing is important because alcohol consumption is a behaviour conducted across the lifespan and is associated with both positive (eg cardiovascular health) and negative (interactions with prescribed medications) consequences. Coordination between the detailed alcohol component in a longitudinal study of ageing and a designated alcohol study would be advantageous and could be used to provide coverage of a longer period of the lifespan.

A synopsis of significant research findings made during the course of the project;

As stated above results were not as we predicted, in that we had anticipated identifying variables that predicted changes in alcohol consumption over time and cohort. Nevertheless several activities and findings are worth mentioning.

A systematic literature review was conducted of life-course factors that influence women's alcohol use over time, the focus was on longitudinal data. There were 174 papers fitting the criteria: longitudinal study, alcohol consumption as the outcome variable; the sample was selected from the adult general population or a representative cohort that was followed to adulthood; and the availability of female specific results.

From this initial group, 85 were excluded owing to insufficient information, a further 21 were excluded with a focus on under 21 year olds, further 39 excluded based on sample un-representativeness and finally a further 9 were excluded owing to outcome variables, cross sectional design. This resulted in only 61 papers that met the inclusion criteria. The majority of papers came from the US.

From the research identified in the review, a number of life course factors emerged as influential to alcohol consumption and abuse and some less influential. For instance from the studies identified, there is little evidence that educational status independently had an impact on alcohol use. Marriage is related to a reduction in drinking and fewer alcohol related problems, and becoming married appears to decrease women's drinking at various different ages stages. Having children was identified as one life course event that reduces alcohol use. Being unmarried or cohabiting was associated with increased drinking. The literature on age effect suggested that younger women, especially those in their early 20's, tend to drink more per occasion than older women, increasing age leads to decreasing alcohol. Within this process there also appears to be a peak in acute heavy drinking during the 30s. Consumption levels at earlier ages and onset of heavy drinking at an earlier age predicts later heavy drinking or alcohol problems. Depression or depressive symptoms were associated with increased alcohol use and alcohol related problems. Good social support was related to less consumption and fewer alcohol problems (with research particularly focused on social support at a young age).

The areas of employment status, financial status, ethnicity and divorced had conflicting results regarding effects on alcohol use. This may be due to most studies using different measures of alcohol use. Some studies controlled for various socio-demographic factors as well as baseline alcohol use, while others did not. No studies had pregnancy as a control or even an exploratory issue in relation to women's alcohol use. Given that women tend to stop or reduce their drinking during pregnancy could be a confounding factor in the research.

The inconsistency in the reviewed studies may be due, in part, by a lack of uniformity in the measurement of alcohol consumption or definitions of problematic alcohol use. Comparing results of studies internationally is hindered by cultural differences in the social setting where alcohol is consumed as well as differences in the amount of grams of pure alcohol contained in typical beverage sizes. In relation to what is excessive or 'binge' drinking appears to be culturally influenced. Plus, different definitions of standard drinks vary across countries. Ethanol content is rarely reported of the 'standard drink'. What was revealing about this review was the inconsistency of results, and the small numbers of articles that qualified for inclusion in the review.

A comparison of a cross-sectional compared to longitudinal analysis revealed that cross-sectional analysis obscures much of the individual-level changes in alcohol consumption over time. Younger women were least likely to abstain from alcohol consumption with only 9% abstaining compared to 15% in the mid-aged cohort and 34% in the older cohort. Younger women also consumed alcohol at the highest quantities while mid-aged and older women consumed at the highest frequency. Less than 6% of women in any cohort were drinking at levels associated with risk in the long-term, however, alcohol consumption at short-term risk levels was exhibited by a large proportion of respondents in the younger and mid-aged cohorts.

Individual-level analysis is valuable in revealing variability in alcohol consumption that may not be apparent in cross-sectional analysis. Prevention efforts may need to treat transient high-risk alcohol consumers differently than consistently heavy alcohol consumers.

Univariate analysis was conducted to determine predictors of decreasing and increasing short term risky drinking (over time) in both the young and middle cohort of women. Factors investigated included life events, social support, health status, and family history of alcohol use, health behaviours, socioeconomic factors, work conditions, and family circumstance. Although many of these factors have been shown to be associated with risky drinking practices when examining impacts on change over time in either increasing or decreasing risky drinking behaviour none of these factors achieved statistical significance in predicting decreasing or increasing risky drinking practices. We examined change in short term risky drinking over time. This showed the young cohort 36% did not change their short term drinking behaviour while35% decreased their short term risky drinking practices and 29% increased. These results are for those aged 18-23 years at base line and then aged 22-27 years at follow up. Comparative proportions for the mid cohort group showed that 37% did not change their short term risky drinking practices, 31% decreased and 33% increased. This cohort was aged 45-50 years at baseline and 47-52 years at follow up. In identifying what predicts cessation of short term risky drinking results were unremarkable for the middle cohort. This may be attributable to the shorter follow up period. Regarding the young cohort a number of factors were significant in the multivariate analysis for predicting the cessation of short term risky drinking. Some factors resulted in an increased odds of stopping short term risky drinking while other factors suggested reduced odds of stopping this risky practice. These results are listed in the table below.

A change in mental health status from depressed to not-depressed had significantly higher odds of stopping short term risky drinking over the four year period relative to those who were not 'depressed' at both time points. That is they were 1.61 times more likely to stop short term risky drinking. Likewise non-smokers were more likely to stop short-term risk than a continuous smoker. Change in BMI (body mass index) looks like being more an indicator of health than lifestyle. The normal range for BMI is 20-25). Those that fell outside the acceptable range over time had higher odds ratio of stopping their risky drinking behaviour. Use of illicit drug use in the previous year was associated with a reduced odds ratio of stopping short term risky drinking. Interestingly the literature suggests gaining employment reduces general risky drinking behaviour. Yet these results suggest that for this particular age cohort becoming employed or staying employed reduces the odds of stopping short term risky drinking. Having a partner loose their job and getting married shows higher odds ratio indicating more likely to stop short term risky drinking. Consistent with the literature having children substantially increases the likelihood of reducing short term risky drinking as indicate by the birth of a first child, however birth of subsequent children was not significant. While becoming married increased the odds of stopping short term risky drinking, starting a m=new close personal relationship results in an odds ratio of less than one, therefore being less likely to stop. Despite the literature suggesting that social supports and a family history of alcohol use impacts on adult drinking behaviour these factors were not significant in these analyses.

This does not necessarily suggest that these factors are inconsequential it could simply be they are not influential on short-term risky behaviour or a greater time period needs to elapse or that the measures were no sensitive enough.

Predictors of stopping short term risky drinking versus continued risk – young cohort	Odds Ratio	Confidence Interval
Changes in mental health (SF36)		
Not depressed (at time1 & 2)	1.00	
Change from depressed to not depressed	1.61	(1.23-2.09)
Changes in smoking status		
Smoking (time 1 & 2)	1.00	
Non-smoker	1.66	(1.29-2.13)
Changes in BMI		
'Acceptable' range time 1 & 2	1.00	
Outside 'acceptable' range	1.33	(1.06-1.68)
Other drug use		
No	1.00	
Yes	0.48	(0.38-0.62)
Changes in employment status		
Not employed at time 1 & 2	1.00	
Changed from not employed to employed	0.56	(0.40-0.79)
Employed at time 1 & 2	0.47	(0.35-0.65)
Partner losing job		
No	1.00	
Yes	2.20	(1.51-3.19)
Change in marital status		
Not married at time 1 & time 2	1.00	
Newly married	1.29	(1.03-1.61)
Currently pregnant		
No/don't know	1.00	
Yes	5.36	(2.57-11.16)
Birth of first child		
No	1.00	
Yes	2.52	(1.75-2.64)
Started a new relationship		
No	1.00	
Yes	0.72	(0.55-0.94)
Social Support		
Low	1.00	
High	ns	
Close family member alcohol 'problem'		
No	1.00	
Yes	ns	

An overview of the research methodology implemented and how this has changed from the approved methodology;

The project was a secondary analysis of the Australian Longitudinal Study of Women Health. The original proposal laid out an analysis of univariate and multivariate methods. Logistic Regression was used for the multivariate analysis. Originally it was thought that Generalised Estimating equations would be used, however this was not the case as we derived a change variable rather than modeling change across time.

Evidence of submission for publication of project material, such as major research findings, in peer review journals;

The paper titled 'Alcohol consumption of Australian women: results from the Australian Longitudinal Study on Women's Health' (Authors: Susan Clemens, Sharon Matthews, Anne F Young, & Jennifer Powers) was submitted to Addiction in December 2005. This paper was not accepted and is currently being rewritten for re-submission. (see attached paper and letter).

The paper titled Changes in short term risky drinking among women: Factors that influence change is incomplete is being written up the time of writing. A copy of the final draft submitted for publication can be forwarded to AERF if wanted.

Similarly the literature review is also being written up and can be forwarded to the AERF on completion. The paper is currently titled The why and when of women's alcohol use: A systematic review of life-course factors influencing women's alcohol use over time.

A methods focused paper is also currently being written up for publication that examines concordance between the alcohol component of the food frequency questionnaire and the quantity frequency measure.

If the AERF requires copies of these once submitted please advise.

Results from the project were accepted for oral presentation at several conferences – national and international and a state parliamentary inquiry.

1. Professional Society on Alcohol and Other Drugs. Paper presented - *Stability and change in women's alcohol consumption.* Melbourne 7th-9th November 2005. Presented by Sharon Matthews.

2. Public Health Association of Australia annual conference. Paper presented – Changes in short term risky drinking among women: factors that influence change 25th-28th September 2005 Perth, Australia. Presented by Sharon Matthews.

3. 16th IHRC (International Harm Reduction Conference) Paper presented – symposium. *Changes in short term risky drinking and factors that influence change among two cohorts of Australian women.* Belfast 20th-24th March 2005. Presented by Sharon Matthews.

4. Invited response to the Drugs and Crime Prevention Committee (DCPC) Inquiry into strategies to reduce harmful alcohol consumption, *Presentation to the DCPC of the Parliament of Victoria*. Melbourne, Australia. Project aspects presented by Sharon Matthews and Susan Clemens.

5. Turning Point Alcohol and Drug Centre Annual 'Work In Progress' Symposium '*Alcohol and Women: Patterns of consumption and policy implications*. Co-presenter Johan Scheffer MP Chair Drugs and Crime Prevention Committee. Melbourne 20th August 2004. Presented by Sharon Matthews.