



# LUND UNIVERSITY

## **Alcohol Use and Mental Health in Middle-aged Women. Women's Health in Lund Area, a Swedish Population-based Study.**

Rundberg, Jenny

2007

[Link to publication](#)

*Citation for published version (APA):*

Rundberg, J. (2007). *Alcohol Use and Mental Health in Middle-aged Women. Women's Health in Lund Area, a Swedish Population-based Study*. [Doctoral Thesis (compilation), Psychiatry (Lund)]. Psychiatry (Lund).

*Total number of authors:*

1

### **General rights**

Unless other specific re-use rights are stated the following general rights apply:

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

Read more about Creative commons licenses: <https://creativecommons.org/licenses/>

### **Take down policy**

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

LUND UNIVERSITY

PO Box 117  
221 00 Lund  
+46 46-222 00 00

## ORIGINAL PAPERS

The thesis is based on the following papers, which will be referred to in the text by their Roman numerals:

- I Cederfjäll J (now Rundberg), Lidfeldt J, Nerbrand C, Samsioe G, Öjehagen A.  
**Alcohol consumption among middle-aged women: a population-based study of Swedish women. The Women's Health in Lund Area (WHILA) Study.**  
*European Addiction Research*, 10: 15-21, 2004.
- II Rundberg J, Lidfeldt J, Nerbrand C, Samsioe G, Romelsjö A, Öjehagen A.  
**Few middle-aged women with severe mental symptoms use psychotropic drugs: The Women's Health in Lund Area (WHILA) Study.**  
*Scandinavian Journal of Public Health*, 33: 384-391, 2005.
- III Rundberg J, Lidfeldt J, Nerbrand C, Samsioe G, Romelsjö A, Öjehagen A.  
**Mental symptoms, psychotropic drug use and alcohol consumption in immigrated middle-aged women. The Women's Health in Lund Area (WHILA) Study.**  
*Nordic Journal of Psychiatry*, 60: 480-485, 2006.
- IV Rundberg J, Lidfeldt J, Nerbrand C, Samsioe G, Romelsjö A, Öjehagen A.  
**Abstinence, occasional drinking and binge drinking in middle-aged women. The Women's Health in Lund Area (WHILA) Study.**  
Submitted to *Nordic Journal of Psychiatry*.

# INTRODUCTION

## ***Background***

Many diseases and health problems have been studied more often in men than in women. There has been a tendency to generalise results from studies performed only on men to the entire population, and so medical services and healthcare have largely been adapted to men's requirements. As few studies have focused on middle-aged women, there is little information about their social, mental and physical state of health. In view of this, the Women's Health in Lund Area (WHILA) study was introduced to a population of women aged 50-59 years. Different research teams have used the material for a large number of studies, such as investigations of the metabolic syndrome (Lidfeldt et al, 2003), cardiovascular disease (Shakir et al, 2007), colorectal cancer (Nazeri et al, 2006), hypertension (Lidfeldt et al, 2002) and incontinence (Teleman et al, 2004). The present thesis will focus on women's alcohol use and mental health, taking their social situation into consideration.

It has been well confirmed that men drink more than women and that young men and women drink more than those who are older (CAN, 2006; Wilsnack & Wilsnack, 1995). However, alcohol use in middle-aged and older women needs special attention for several reasons: women are more sensitive to alcohol than men, and the risk for negative alcohol-related health effects is greater for older women than for older men at the same level of alcohol use. In addition, alcohol may interact with medications, not least with psychotropic drugs, which are more often prescribed to middle-aged and older women (Blow & Barry, 2002).

Women suffer from depression and anxiety disorders more often than men (Bijl et al, 1998; SBU, 2004; 2005), and they have a higher prevalence of mental symptoms (Al-Windi et al, 1999; Korten & Henderson, 2000; Krantz, 2000; Tibblin et al, 1990a). In a large population-based study of women it was found that older women reported better mental health and less stress than young and middle-aged women (Brown et al, 1999). The change in oestrogen levels during menopause creates a high-risk period for the occurrence of mental symptoms in some women, but study results are conflicting (Amore et al, 2007; Brace & McCauley, 1997; Ekström & Hovellius, 2000). In their middle age some women will face several life changes, including losses that can be stressful, such as retirement, children leaving home, and death of

partner/parents. In this period women will also have a stressful life with multiple roles – paid work as well as unpaid work: home duties, care of children, grandchildren, and sick and elderly relatives.

The women in this study were born between 1935 and 1945, so they were 50-59 years old when invited to the WHILA-study. They belong to a generation that has experienced many changes in women's living conditions and social position, which have probably affected both their lifestyle and their health. They have experienced opportunities as well as difficulties that in many ways have differed from those of their mothers. These concern education and employment, as well as gender-related issues, e.g. how to model and handle the roles as a woman, mother and wife.

This study will focus on the women's present situation but firstly, as a background to the study, it seems important to describe the major changes regarding women's living conditions that have occurred during their lifetime.

### **Changes in women's living conditions and social position**

Since the period of industrialisation the ideal in Sweden was that women should be housewives. However, in reality this was often possible only in the middle classes. The development of the welfare state brought immense changes to women's lives. Some of the work that women had earlier carried out in their homes was being transferred to the public sector, and at the end of the 1950s the ideal of women as housewives began to be questioned. Gradually more women became gainfully employed, and soon a growing number of women were continuing to higher education and aiming for a career of their own. In the 1970s a major expansion of day nurseries began. This, along with improved parental benefits, made it easier for women to combine family and work life (Carlstedt & Forssén, 1999; Forssén & Carlstedt, 2003). Today, 75% of women and 81% of men are gainfully employed, but more women than men work part-time. On the other hand women perform more unpaid work (domestic work) than men (SCB, 2006).

The description above represents the conditions in Sweden, but also reflects general trends in western societies. In Europe and the U.S. women's living conditions have changed dramatically in recent decades. The percentage of women participating in the labour force has risen, and so has the percentage of women who complete higher education. In addition, women's mean age at their first childbirth has risen, while birth rates have decreased

(Allamani et al, 2000; Barnett, 2004). Because of the massive changes that have taken place with respect to women's education, gender-role attitudes, paid employment, and fertility, few expect a return to the "traditional family" with women as housewives. Instead the demographic trends increase the likelihood that most women will continue to occupy multiple roles in the future (Barnett, 2004).

### **The effect of multiple roles**

The effect of multiple roles on women's mental health and alcohol consumption has received much attention. Traditionally, research has been conducted within two competing hypotheses. The role strain theory proposes that because each person has limited time and energy, women with multiple roles often experience "role conflicts", which result in harmful effects on their mental health and increased risk for alcohol problems. The opposing theory, supported by the majority of studies, suggests that each additional role brings benefits, including increased social contacts and self-esteem, which contribute to better health and greater psychological well-being and thus a decreased risk for alcohol problems (Barnett, 2004; Maclean et al, 2004; Wilsnack & Wilsnack, 1995). In recent years the hypothesis that role quality is a stronger predictor of health status than the number of roles, or time spent in a role, has gained wide support (Barnett, 2004).

### **Immigrant women a vulnerable group**

Another important change in European society is that immigration has increased dramatically (Allamani et al, 2000). Today 13% of the population in Sweden was born in another country (Marklund, 2007). The character of the immigration to Sweden has varied over time. During the Second World War refugees came to Sweden from Germany, other Nordic countries and the Baltic States. Many of them returned to their native countries after the war. In the post-war period mainly labour migrants from the Nordic countries and southern Europe immigrated to Sweden, followed in the 1970s and 1980s by forced migration from Latin America, the Middle East and Eastern Europe. The years 1992-2000 were characterised by refugees from the former Yugoslavia, thereafter immigrants from Iraq, Poland and Denmark have dominated (Marklund, 2007; Migrationsverket).

Immigrants in general are considered a vulnerable group as they may face a number of stressors, such as acculturative stress when leaving their home country and trying to adapt to the beliefs and values in the new culture, socioeconomic stress when feeling disempowered because of inadequate financial resources and limited social class standing, and minority

stress when encountering prejudices and racism (Caetano et al, 1998). Many immigrant women try to balance between their traditional role expectations and the new country's lifestyle and expectations. As a result, the women continue to perform the majority of domestic labour while also maintaining employment outside the home. The changing roles of immigrant women have been shown to affect their mental health, and in particular to put them at greater risk of depression (Maclean et al, 2004).

Immigrants bring attitudes and habits in relation to alcohol consumption from their country of origin. Patterns of alcohol abuse in the country of origin have been found to be strong determinants of alcohol-related disorders in the new country (Hjern & Allebeck, 2004). On the other hand, when immigrants become assimilated into their new society their alcohol consumption usually changes to resemble that of the society they have entered (Johnson et al, 2002; Wilsnack & Wilsnack, 1995).

This study will focus on middle-aged women's alcohol consumption, binge drinking and some indicators of problem drinking. The study will also focus on the women's mental symptoms, use of psychotropic drugs and suicidal behaviour. Alcohol use disorders and mental disorders will not be investigated. A separate analysis will examine alcohol consumption and mental health among the immigrant women.

## ***Women's alcohol use***

### **Alcohol consumption has increased**

Historically, the most dramatic change seen regarding women's alcohol consumption is that today women do drink alcohol. Just half a century ago, many people found the idea of female drinking offensive. The ideal that a woman should not drink alcohol was legally supported by the fact that married women had no right to buy alcohol during the period of "the liquor ration book" which lasted from 1919 until 1955. A single woman could apply for the right to buy alcohol but she had to explain in her application why she needed it. When "the liquor ration book" was withdrawn, a slow increase of women's alcohol drinking appeared, and later there was an increase in the amount of alcohol consumed (SOU, 1994). The increase in women's alcohol consumption reached a peak during the 1970s. In 1968 women's alcohol consumption corresponded to one-quarter of men's consumption, in the 1980s and 1990s it was 40%, and

since 1996 it has increased to 45% (CAN, 2006).

Since Sweden joined the European Union in 1995 there have been major changes in alcohol policies, which have resulted in greater accessibility of alcohol, both within Sweden and from neighbouring countries with low prices. The policy changes regarding accessibility of alcohol and its price have certainly made a substantial contribution to the increased alcohol consumption in recent years (Leifman, 2005). Furthermore, the introduction of bag-in-box wine has been considered to be of importance for the increased alcohol consumption, in particular among women aged 50 or older (Leifman, 2003).

Compared with the latter part of the 1990s, the total yearly alcohol consumption up to now has increased by around 2.5 litres of 100% alcohol per adult, or slightly more than 30%.

Women have increased their alcohol consumption more than men, in particular women aged 50 years or older (CAN, 2006; Leifman, 2003; 2005).

Men drink more than twice as much as women. Men aged 15 years or older, on average, drink 14 litres of 100% alcohol a year, while women drink 6 litres. Converted into wine (12 percentages by volume) this corresponds to approximately 3 bottles a week for men and 1.3 bottles a week for women (Leifman, 2005). The genders differ in their beverage preferences: among men strong beer has a dominant position, while wine is predominant among women. In both genders alcohol consumption is greatest in the early twenties and then decreases. In men the consumption decreases linearly with age, while in women there is a temporary increase in the forties (CAN, 2006).

Regarding statistics it is important to note the uneven distribution of alcohol consumption. One-tenth of the population drinks approximately half the total amount of alcohol consumed and only 30% drink more than the mean consumption (Leifman, 2005).

More women than men are abstainers, and abstinence is more common among older women than among younger (CAN, 2006). According to a recent Swedish report 19% of the women and 11% of the men aged 17 or older had not drunk alcohol in the past 12 months (including life-long abstainers), and 8% and 4% respectively were life-long abstainers. In women aged 50-65 years the frequency of abstainers was 13% (12-month) and 4% (life-long) (Selin, 2004). Middle-aged immigrant women are more often abstainers than Swedish women of the same age (Österling & Berglund, 1996).

### **Homogenisation of drinking habits within the European countries**

Alcohol consumption varies substantially between different countries. However, studies reveal a certain homogenisation between the European countries since the 1950s.

Changes in beverage-preferences perhaps constitute the most widely used evidence for a homogenisation of European drinking cultures. Although significant differences in general still remain concerning beverage preferences, the share of the traditionally dominant beverage has diminished in all countries to the extent that there is not one single dominantly spirit-drinking country left in Western Europe (Leifman, 2001; Simpura & Karlsson, 2001). In Sweden, which was considered as one of the spirit-drinking countries, the main beverages today are beer and wine (CAN, 2006).

Also, per capita alcohol consumption in different countries reveals signs of some homogenisation. In many countries with originally high consumption there has been a decrease, while in some countries with originally lower consumption an increase has taken place (Leifman, 2001; Simpura & Karlsson, 2001). Alcohol consumption in Sweden is still one of the lowest in the European Union, but in recent years the difference in level of consumption in comparison with other European countries has diminished considerably (Leifman, 2005).

### **Binge drinking**

In recent years several studies have emphasized the importance of drinking patterns, especially irregular heavy drinking, often referred to as binge drinking. This drinking pattern has been linked with increased mortality, risk of disease, mental health problems and social harm (Gmel, et al 2001; Graham et al, 2007; Kuntsche et al, 2004; Rehm et al, 1996; Room et al, 2005; Tolstrup et al, 2004).

Binge drinking is more prevalent in the northern and middle parts of Europe where heavy drinking at weekends is more culturally accepted, compared to the southern parts (Kuntsche et al, 2004). However, although social tolerance towards drinking and drunkenness varies between different European countries, in all countries tolerance towards excessive drinking is definitely lower for women, particularly for middle-aged and older women (Allamani et al, 2000).

Almost all studies reporting gender differences find that binge drinking is much more common among men. Furthermore, most studies show that binge drinking is highest among adolescents and young adults (Kuntsche et al, 2004).

According to the WAG study (Women and Alcohol in Göteborg) the prevalence of female binge-drinking in Sweden generally decreased between 1989/90 and 1995/96 (Thundal et al, 2000). Representative studies of the Swedish population show that binge-drinking occasions have increased by approximately 40% between the years 1998 and 2004. This increase is



mainly accounted for by an increase among men, while for women changes have been less pronounced. In women aged 50-64 there has been a tendency to an increase in the last years. In the latest survey, from 2004, 25.1% of the women in this age group reported binge drinking (defined as  $\geq 5$  drinks) at least once per year, and 5.9% at least once a month. As expected the figures were much higher when younger women were included. Among women aged 18-64 the figures were 45.7% and 15.3%, respectively (Leifman, 2005).

### **Alcohol use disorders**

Among the alcohol use disorders according to the Diagnostic and Statistical Manual (DSM-IV) alcohol abuse is more prevalent than alcohol dependence. The gender differences are striking for both disorders: alcohol abuse is four to five times more frequent among men. According to the European study NEMESIS, the prevalence among women for alcohol abuse varies from 1.8% (12-month) to 3.9% (lifetime), and for alcohol dependence 1.1% (12-month) and 1.9% (lifetime). The prevalence of alcohol use disorders declines sharply with increasing age in both men and women (Bijl et al, 1998). According to the WAG study the prevalence of alcohol abuse and dependence taken together in a Swedish population of women was 3.9% (lifetime) and 1.3% (12-month). In women aged 50 the prevalence was 3.8% (lifetime) and 0.8% (12-month) (Thundal et al, 2000).

## ***Measurement of alcohol use***

### **Standard drinks**

As a measure of alcohol consumption the term “standard drink” is often used. The size of one standard drink can vary. In Swedish studies, 12 g of 100% alcohol is most commonly used as reference amount, which corresponds to one glass of wine (15 cl, 12% alcohol), one bottle of strong beer (33 cl, 5% alcohol), or one snaps (4 cl of spirits, 40% alcohol) (Andréasson & Allebeck, 2005).

### **Alcohol consumption**

There is no single way of asking about alcohol consumption that is suitable for all research purposes and populations. Some frequently used methods in population-based studies will be described; each measure has strengths and limitations (Dawson & Room, 2000; Del Boca &

Darkes, 2003; Fonager & Sabroe, 2001; Heeb & Gmel, 2005; Stockwell et al, 2004).

*Quantity frequency.* This is a common approach where the respondent is asked about the usual amount of alcohol he/she consumes on one drinking occasion and the usual frequency of drinking.

*Graduated frequency.* Using this approach the respondent is asked how often during the designated reference period he/she drank various quantities of standard drinks. Typically, the respondent is first asked the largest quantity of drinks consumed during the reference period.

*The Finnish approach.* In this approach the overall frequency of drinking is followed by detailed questions about a period containing, at a minimum, the last four drinking occasions, e.g. past week for individuals drinking 4+ times a week, past month for those drinking once a week, etc.

*Time-line follow-back.* The respondent is asked to report the amount he/she drank on each day during a specific time interval. The time frame can vary but is often short.

*Summary measures.* Information is gathered by asking the respondent about the amount of alcohol he/she usually drinks. The time frame can vary, e.g. in a day, a week or a month.

Based on the estimated alcohol consumption, different cut-off levels are used to define low, moderate and heavy drinking, and these levels are often lower for women than for men.

## **Binge drinking and problem drinking**

Binge drinking is often defined as having at least a specified number of drinks in one day or on one occasion. The number of drinks differs between studies and populations, but is often lower for women than for men. A threshold of four drinks has been considered suitable for women (Andréasson & Allebeck, 2005; Wechsler et al, 1995).

When investigating the occurrence of alcohol use disorders the definitions according to the Diagnostic and Statistical Manual (DSM-IV) and the International Classification of Diseases (ICD-10) are used.

To identify potential or established alcohol problems there are several validated screening instruments, such as the Michigan Alcoholism Screening Test (MAST) (Selzer, 1971), the CAGE (an acronym for Cut-down, Annoyed, Guilt, Eye-opener (Mayfield et al, 1974), and the Alcohol Use Inventory (AUI) (Wanberg et al, 1977). In population-based studies the Alcohol Use Disorders Identification Test (AUDIT) is frequently used since it provides the possibility of early detection of harmful and hazardous drinking (Saunders et al, 1993).

Several reports from clinical studies as well as from community studies have indicated gender

differences in the way men and women display alcohol problems (Österling, 1997). Two instruments were developed in Sweden to increase identification efficacy in women; the SWAG instrument (Screening Women and Alcohol in Göteborg) (Spak & Hällström, 1996), and a briefer instrument developed by Österling (Österling, 1997).

In addition, biological markers such as gamma-glutamyl transpeptidase (GGT), mean corpuscular volume (MCV), carbohydrate-deficient transferrin (CDT), and phosphatidylethanol (PEth) can be used to detect high alcohol consumption and/or organ damage due to alcohol (Hartmann et al, 2007).

## ***Women's mental health***

### **Mental health problems in women have increased**

While there are established diagnostic criteria for mental disorders, there is no clear definition of what constitutes a mental health problem. In some studies it is defined as having mental symptoms, while in others as suffering from a mental disorder. Previously, mental health problems were often considered as a continuum with varying degrees of severity – from mental health via mental symptoms and problems to mental disorders. Today it is more often viewed as two different dimensions, a health dimension and a disease dimension. The health dimension concerns the individual experience, i.e. how the person feels. The disease dimension concerns whether the person fulfils criteria for a mental diagnosis or not. In practice these two perspectives can be mixed. Most people who consider themselves as mentally healthy do not have a mental disorder. Some experience mental health problems without fulfilling the criteria for a mental diagnosis. Many who suffer from mental disease also experience mental distress, but some can, e.g. by way of adequate medication, be helped to enjoy an acceptable mental health (Stefansson, 2006).

While the frequency of the more serious mental diseases, e.g. schizophrenia, have not noticeably changed in the population over time, a huge increase in mental health problems has been reported in recent years. The frequency of people with some form of mental health problem varies between 20% and 40% in different studies. Of these, the proportion of people with serious complaints, i.e. those that may call for psychiatric treatment, is estimated to be between 10% and 15% (Stefansson, 2006).

In the Swedish Lundby Study the point prevalence rate of neurosis was investigated over 50 years. The study started before the DSM system was in use. The term neurosis refers to a non-psychotic mental illness (e.g. depression or anxiety) in the absence of an organic brain disease. There was a pronounced increase of neurosis from 1947 to 1972 for both sexes, while from 1972 to 1997 there was a slight decrease in women aged 40-59, but not for men or older women. Younger people were not investigated. In the last survey, 1997, the point prevalence of neurosis was 18.3% among women aged 40-59 (Nilsson et al, 2007).

According to the Survey of Living Conditions, Statistics Sweden, the proportion of people who experienced distress from anxiety states declined during the 1980s, but has since increased, particularly since the mid 1990s. The increase has been more pronounced among women. Among women, increase has been dramatic in the youngest age groups, while for middle-aged and older women rather constant high levels of distress have been reported (Stefansson, 2006). Another indication of impaired mental health in Swedish women is the pronounced increase of long-term sick leave due to mental causes that has occurred since the mid-1990s (RFV, 2000; SBU, 2003).

Different explanations have been given for the increase in mental health problems. It has been considered that symptoms are subjective and can easily change over time owing to media influence or general changes in attitudes. Furthermore, the importance of economic cutbacks, with consequences for the welfare system and reduced opportunities for preventive action, has raised. Finally, it has been argued that the social climate has grown tougher, with a more demanding work life and increased pressure on individual performance and success (Stefansson, 2006).

## **Mental symptoms**

Women report more mental symptoms than men (Al-Windi et al, 1999; Korten & Henderson, 2000; Krantz, 2000; Tibblin et al, 1990a).

Regarding the influence of age on mental symptoms, the results are not consistent. In one Swedish population-based study, peak prevalence of several mental symptoms was found in people aged 50 (Tibblin et al, 1990a), while in other studies mental symptoms measured with the same instrument showed a tendency to decrease with age (Al-Windi et al, 1999; Ekström & Hovelius, 2000).

Among middle-aged women the influence of menopause on mental health has received a lot of attention. However, some studies reveal an increase of mental symptoms after menopause

(Amore et al, 2007), while others find menopause to be of minor importance in this respect (Ekström & Hovelius, 2000).

Several studies have pointed out poorer mental health among immigrants compared to native Swedes in terms of psychosomatic complaints, psychological distress, longstanding psychiatric illness and post-traumatic stress disorder (Bayard-Burfield et al, 2001; Frans, 2003; Iglesias et al, 2003; Sundquist, 1994).

### **Mental disorders**

Mental disorders are common in the general population. Women are approximately twice as likely to suffer from mood and anxiety disorders than men. According to the European NEMESIS study the prevalence among women for mood disorders is 24.5% (lifetime), 9.7% (12-month), 5.0% (1-month), and for anxiety disorders 25.0% (lifetime), 16.6% (12-month), 12.9% (1-month) (Bijl et al, 1998). In the NEMESIS study the highest rate for mood disorders was recorded for women 35-44 years old, while for anxiety disorders there was little divergence between the age groups (Bijl, et al 1998). Others have found the prevalence of depression to be highest in middle age (45-54 years) (Wilhelm et al, 2003).

According to the Swedish Lundby Study the point-prevalence in women aged 40-59 years was 5.1% for depression and 7.2% for anxiety. The figures were higher in older women (Nilsson et al, 2007).

### **Psychotropic drug use**

Women use psychotropic drugs more than men (Apoteksbolaget, 2007; Graham & Vidal-Zeballos, 1998; Pietraru et al, 2001). In Sweden all sales of prescribed medications are registered; sales of antidepressants are higher for women aged 50-64 than for both younger women and women aged 65-74; sales of anxiolytics and hypnotics increase with age (Apoteksbolaget, 2003; 2007). A more frequent use of psychotropic drugs has been demonstrated in immigrants compared to native Swedes (Bayard-Burfield, 1999; Bayard-Burfield et al, 2001; Hjern, 2001).

## **Suicide and suicide attempts**

In Sweden suicide, including cases with unclear intention, represents less than 1% of women's total mortality and slightly less than 2% among men (Stefansson, 2006). Suicide rates are higher among older people compared to younger people, peaking in the age group of 45-64 year-olds in Sweden (NASP). Both men and women born abroad are at increased risk for suicide in comparison with native Swedes. Furthermore, suicide rates in immigrant groups in Sweden are higher than for compatriots still living in their respective country of origin (Ferrada-Noli, 1997; Johansson et al, 1997).

Suicide attempts and other self-inflicted injuries are estimated to be 15-20 times more common than suicide for women, and 10-15 times more common for men (Stefansson, 2006). The highest rates of suicide attempts are found among 15-24 year-olds for both sexes, thereafter decreasing with increasing age (NASP). Immigrants have a higher risk for attempted suicide than Swedish-born people (Westman et al, 2003). Foreign-born women aged 45-54 have two times higher rates for suicide attempt than Swedish-born women that age (Bayard-Burfield et al, 1999).

Few population-based studies have investigated the prevalence of suicidal thoughts. In one Swedish population-based study 21.1% reported suicidal thoughts at some stage in life and 8.6% in the last year. No significant gender differences were found (Renberg, 2001).

## ***Measurement of mental health***

In studies investigating mental disorders, the definitions according to the Diagnostic and Statistical Manual (DSM-IV) and the International Classification of Diseases (ICD-10) are used. The diagnosis can be determined with the aid of structured diagnostic interviews such as the Diagnostic Interview Schedule (Robins et al, 1981) and the Composite International Diagnostic Interview (Robins et al, 1988).

Self-report questionnaires have been developed to identify specific mental health problems such as depression and anxiety, i.e. the Beck Depression Inventory (BDI) (Beck et al, 1961; Richter et al, 1998) and the Hospital Anxiety and Depression Rating Scale (HADS) (Bjelland et al, 2002).

In population-based studies, instruments measuring general mental health are more often used. One commonly used self-report questionnaire is the Symptom Checklist-90 (SCL-90),

which measures psychological symptoms over the past week (Derogatis et al, 1973). Another is the General Health Questionnaire, which has many versions; the most commonly used contains 12 questions (GHQ-12) (Goldberg et al, 1997).

The Göteborg Quality of Life instrument (GQL) is a Swedish instrument that covers both common symptoms and quality of life (Tibblin et al, 1990b). Some instruments have been developed to study specific populations. The Women's Health Questionnaire is developed to measure middle-aged women's emotional and physical health (Hunter, 1992; Wiklund et al, 1993).

## ***The association between alcohol use and mental health***

### **Alcohol consumption and mental health problems**

Reviews of studies investigating the association between alcohol consumption and mental health problems have concluded that light and moderate drinking may be associated with better mental health than abstinence (Chick, 1999; Peele & Brodsky, 2000). Positive associations have been found in areas concerning subjective health, mood enhancement, stress reduction, sociability, social integration, mental health and long-term cognitive functioning (Peele & Brodsky, 2000). However, there are conflicting results, and several methodological difficulties have to be considered such as history of drinking, confounding variables, and how to establish causality. There is no evidence suggesting that light or moderate drinking improves mental health (Chick, 1999).

The importance of controlling for several potential confounders was illustrated in a study examining the association between moderate alcohol use and depressive mood. After adjustment only for demographic variables, such as age and gender, moderate drinkers had significantly lower levels of depressive mood than lifetime abstainers, ex-drinkers and heavy-drinkers. When controlling also for socio-economic variables, such as education and employment, the significant difference in depressive mood between moderate drinkers and lifetime abstainers vanished. When health variables were also included, such as medication and subjective health status, the difference between moderate drinkers and ex-drinkers vanished. Only in heavy drinkers did a significant increase of depressive mood remain (Paschall et al, 2005).

A few studies have investigated the association between alcohol use and mental health in

middle-aged and older populations. One study of a general population sample investigated the relationship between symptoms of anxiety and depression on one hand and alcohol use on the other across different age groups. In both sexes, but particularly in women, a U-shaped relationship was found, i.e. non-drinkers, occasional drinkers as well as heavy and problem drinkers reported more mental symptoms than those drinking at moderate levels. This pattern, however, was not found in those aged 60 or older (Rodgers et al, 2000). Contradictory results were found in a recent study focusing on persons aged 50 and over. It was found that in both men and women moderate levels of alcohol consumption were associated with better cognition and subjective wellbeing, and fewer depressive symptoms, than abstinence. The results were controlled for socio-demographic factors, medical history and lifestyle variables, but those with symptoms of problem drinking or alcohol abuse were excluded from the analyses (Lang et al, 2007).

### **Binge drinking and mental health problems**

Most studies find a strong association between binge drinking and adverse mental health. In a recent study it was found that depression was primarily related to drinking larger quantities per occasion, i.e. binge drinking, less related to volume, and unrelated to drinking frequency (Graham et al, 2007). The importance of binge drinking was also found in a Finnish population-based study. Both men and women with heavy drinking occasions had higher scores of depressive symptoms compared to those with the same average alcohol consumption but without heavy drinking occasions (Manninen et al, 2006).

In a longitudinal study of the general population, binge drinking was not associated with the onset of anxiety or depression and, vice versa, anxiety and depression were not associated with binge drinking at follow-up. However, the analysis stratified by gender suggested that men who engaged in binge drinking were at greater risk of anxiety and depression, compared to men who did not binge drink, while no such association was observed for women (Haynes et al, 2005).

### **Alcohol use disorders and mental disorders**

High comorbidity of alcohol use disorders and psychiatric disorders has been documented in epidemiological and clinical studies (Berglund & Öjehagen, 1998; 2005; Grant et al, 2004). In a population-based sample of Swedish women, half of the women with lifetime alcohol dependence or abuse also had a lifetime diagnosis of a depressive disorder, and 25% of the women with a depressive disorder also had alcohol dependence or abuse (Spak et al, 2000).



# AIMS

The overall aim of this thesis is to increase knowledge about alcohol use and mental health in middle-aged women by investigating a population of women aged 50-59 years.

## ***Specific aims***

- To investigate women's weekly alcohol consumption, both in terms of quantity and type of alcoholic beverage consumed, and to analyse the association between level of alcohol consumption on one hand and social situation, mental health and physical health on the other.
- To investigate the prevalence of mental symptoms and psychotropic drug use, and to analyse the association between severe mental symptoms and alcohol consumption, social situation and health.
- To analyse alcohol consumption, mental symptoms, and psychotropic drug use in immigrant women, and to analyse the possible influence of age at the time of immigration.
- To investigate drinking patterns; abstinence, occasional drinking, binge drinking, and possible problem drinking, and to analyse these drinking patterns in relation to social situation and health, with special emphasis on mental health.

# MATERIAL AND METHOD

## ***Study population***

All women (n=10,766) aged 50-59, born between 2 December 1935 and 1 December 1945, and on 1 December 1995 living in the municipalities of Lund, Lomma, Kävlinge, Staffanstorp and Burlöv, located in southern Sweden, received a mailed invitation to participate in the health survey, Women's Health in Lund Area (WHILA). The WHILA study ran from 2 December 1995 until 3 February 2000.

The study population was identified through a population register comprising all inhabitants in the Lund area (n=172,005). Informed consent was obtained from all participants. The women did not receive any reimbursement for their participation. The Ethics Committee at Lund University approved the study.

## **Settings**

The study was conducted at the Department of Community Medicine, in collaboration with the Division of Primary Health Care, Skåne County, and the Department of Obstetrics and Gynaecology, University Hospital, Lund, and the Department of Endocrinology, University Hospital MAS, Malmö, Sweden. The clinical examinations were performed at the Primary Health Care Centres of Dalby and Södertull and St Lars Hospital, Lund.

## **Participants**

A total of 6,917 women (64.2%) participated in the WHILA study; the final 901 agreed to participate after one postal reminder and an additional 20 after two reminders. At participation the women were  $56.4 \pm 3.0$  years, with the youngest being 50.1 years and the oldest 64.1 years.

## **Non-participants**

Available data on all non-participants (n=3,849) showed that they were of the same age as participants (n=6,917). More non-participants than participants died during the period 1995-1998 (2.6% vs. 0.2%,  $p < 0.001$ ), as well as during the following two years, 1999-2000 (1.5% vs. 0.3%,  $p < 0.001$ ). Cause of death was analysed for the years 1995-1998. The main cause was cancer (non-participants: n=64/99, participants: n=10/12), followed by cardiovascular diseases (non-participants n=14/99, participants n=0).

Use of medical services in the year 1998 was analysed.

#### *Out-patient care*

Fewer non-participants than participants visited a general practitioner (44% vs. 53%,  $p < 0.001$ ) or a senior practitioner (43% vs. 49%,  $p < 0.001$ ), but they had more often visited a psychiatrist (4.4% vs. 2.8%,  $p < 0.001$ ) or a psychotherapist/psychologist (2.3% vs. 1.7%,  $p < 0.05$ ).

#### *In-patient care*

More non-participants than participants were hospitalised on a somatic ward (8.9% vs. 7.8%,  $p < 0.05$ ) or a psychiatric ward (0.9% vs. 0.4%,  $p < 0.01$ ). The non-participants remained hospitalised for more days ( $17.4 \pm 37.8$  vs.  $9.3 \pm 28.1$ ,  $p < 0.001$ ). Diagnoses according to the International Classification of Diseases were analysed for the hospitalised women. Non-participants had more often been diagnosed as alcohol dependent (0.4% vs. 0.1%,  $p < 0.05$ ). Other psychiatric diagnoses did not differ between participants and non-participants.

#### *Socio-economic status*

There were no differences in the response rate between women living in the central city of Lund compared to those living in the suburbs. Among the latter, five out of a total 21 suburbs showed differences in the distribution between participants and non-participants, indicating a higher drop-out rate in areas known to have lower socio-economic status.

#### *Country of birth*

According to figures from Statistics Sweden, 89.4% ( $n=9,649$ ) of all women aged 50-59 years living in the Lund area in 1995 were native Swedes, 3.5% ( $n=379$ ) were born in another Nordic country, 5.5% ( $n=595$ ) were born in another European country, and 1.5% ( $n=167$ ) were born outside Europe. In comparison with our figures (presented in Paper III), Nordic and non-European immigrants were representative, whereas European immigrants participated less often.

## **Method**

The WHILA study included a physical examination and a self-administered questionnaire. This study is based on the questionnaire only. The subjects received the questionnaire by post along with the invitation to the study; they completed the questionnaire at home, and returned it at the examination where a specially trained nurse/midwife helped them to correct questionnaire replies. This resulted in one or more corrections in 19% of the questionnaires

(Li et al, 2002). An interpreter assisted when needed.

## **Basic questionnaires**

### *Socio-demographic factors*

The subject stated *household composition* (living with partner, alone, with partner and child, single parent or with parents/other), *highest level of education* (comprehensive school, upper secondary school or university education), *employment status* (full-time/part-time work, student, unemployed, granted a disability pension, on sick leave for at least 6 months, or housewife), and if she *visits friends* at least once a month or not. *Civil status* (married, unmarried, divorced, or widowed) was also included in Paper I, but in the following papers it was considered sufficient to analyse household composition.

### *County of birth and age at immigration*

*Country of birth*, categorised as being born in Sweden or being an immigrant (i.e. not born in Sweden) was used in the analysis in Papers I, II and IV. In Paper III, which was aimed at studying immigrant women in more detail, six categories were created: “native Swede”, “Finnish immigrant”, “Nordic immigrant” (i.e. born in Denmark, Iceland or Norway), “Eastern European immigrant” (also including former Soviet Union), “Western European immigrant” (also including southern Europe), and “non-European immigrant”. In Paper III *age at immigration* was also analysed. According to their age at immigration, the women were divided into three groups: <18 years old (lowest quartile), 18-34 years old, and  $\geq 35$  years old (highest quartile).

### *Alcohol consumption and smoking*

To investigate *alcohol consumption* the subject was asked, “How much alcohol do you drink in an ordinary week?” and to report the number of glasses/bottles (specified in centilitres) of wine, beer and spirits respectively, or the option “no alcohol”. Beer did not include low-alcohol beer. The alcohol intake was converted into grams of alcohol and summarised into total weekly alcohol intake. Twelve grams of 100% alcohol equals one drink. Based on this data, the subject was categorised as “Non-drinker” (0 g, 0 drinks), “Low drinker” (1-83 g, less than 7 drinks), “Moderate drinker” (84-167 g, 7-13 drinks) or “Heavy drinker” ( $\geq 168$  g, at least 14 drinks).

The subject was asked if she was a *current smoker* or not, which was analysed in Paper I, II and IV.

### *Mental and physical symptoms*

The Göteborg Quality of Life (GQL) instrument was used to measure *mental and physical symptoms*. The subject answered “yes” or “no” as to whether the symptom had troubled her during the past three months. The instrument uses ten mental symptoms: restlessness, difficulty in relaxing, impaired concentration, nervousness, irritability, exhaustion, sleeping disturbance, general fatigue, depression and cries easily. The instrument also contains nineteen physical symptoms: eye-problems, impaired hearing, headache, dizziness, coughing, chest pain, breathlessness, loss of weight, sweating, feeling cold, pain in the legs, backache, pain in the joints, abdominal pain, constipation, diarrhoea, nausea, loss of appetite, and difficulty in passing urine. The GQL instrument contains one more symptom “overweight” but this was excluded in the WHILA study (Tibblin et al, 1990b).

In Paper I the symptoms were analysed separately. In Papers II, III and IV symptom severity was analysed based on the sum of confirmed symptoms. The subject’s *severity of mental symptoms* was categorised as “Absent/Slight” (sum of 0-1 symptoms, lowest quartile), “Moderate” (2-6 symptoms) or “Severe” (7-10 symptoms, highest quartile). Likewise, each subject’s *severity of physical symptoms* was categorised as “Absent/Slight” (sum of 0-2 symptoms, lowest quartile), “Moderate” (3-7 symptoms) and “Severe” (8-19 symptoms, highest quartile).

### *Psychotropic drug use*

The subject was asked to report whether she used any *medications* regularly and, if so, what sort of medications. In Paper II use of the *psychotropic drugs* anti-epileptics, neuroleptics, anxiolytics, hypnotics, and antidepressants was analysed separately, as well as the use of some *drugs in adjacent areas*; drugs for gastric ulcers, loop diuretics, opiates, and analgesics. In Paper III use of anxiolytics, hypnotics, and antidepressants was analysed separately, and in Paper IV use of any psychotropic drug (i.e. any of the five types of drugs) was analysed. Medical records were not reviewed.

### *Medical control and diseases*

The subject reported whether she underwent *medical control* for a disease or not, and this was analysed in Papers I and IV. In Paper II the women’s stated reason for medical control was divided into “mental” or “physical” (i.e. physical reasons only). The first category included women who also underwent medical control for a physical reason since few women (n=70) had medical control solely for mental reasons.

The subject stated whether she suffered from or had suffered from any of the following five *diseases*; hypertension, diabetes, thrombosis, heart attack, and cerebral haemorrhage/stroke. This data were used in the analyses in Papers I and II.

Use of *medical services* was analysed in Paper I. The subject reported number of doctor's appointments last year, days of illness last year, if she had been hospitalised at any time during the last five years and, if so, for how many days.

#### *Menopause and hormone replacement therapy (HRT)*

Paper II included an analysis based on whether the subject was *pre- or post-menopausal*.

Menopause was defined as a menstruation-free period of at least 12 months. The subject also stated whether she used *hormone replacement therapy*, and this was analysed in Papers II and III.

### **The additional questionnaire**

The study was already planned and data collection was in progress when a general discussion arose about analysing items on alcohol consumption and mental health. An additional questionnaire was then constructed to examine drinking patterns, possible indications of problem drinking, and mental illness. This questionnaire was sent to the final 513 participants. The items were analysed in Paper IV.

#### *Drinking frequency and drinking quantity*

The subjects were asked two questions based on the Alcohol Use Disorders Identification Test (AUDIT); "How often do you have a drink containing alcohol?" (never, monthly or less, 2-4 times/month, 2-3 times/week, or  $\geq 4$  times/week) and "How many drinks do you have on a typical day when drinking alcohol?" (1-2 drinks, 3-4 drinks, 5-6 drinks, or  $\geq 7$  drinks) (Saunders et al, 1993).

If the subject responded that she never drinks alcohol she was categorised as an "Abstainer", if she affirmed drinking but in the basic questionnaire had stated no drinking in an ordinary week, she was categorised as an "Occasional drinker", otherwise she was categorised as a "Weekly drinker".

### *Binge drinking and problem drinking*

As a definition of *binge drinking*, a threshold of four drinks has been considered appropriate for women (Andréasson & Allebeck, 2005; Wechsler et al, 1995). The subject stated the number of occasions on which she had had at least four drinks in one day in the last year and in the last month, respectively.

Based on the Swedish Alcohol Use Inventory (AVI) (Berglund et al, 1988), four items were selected that concern emotional and interpersonal complications and that have been found pertinent to female *problem drinkers*: drinks to relieve tension, shows marked resentment when drinking, drinks to overcome feelings of inferiority, and worries about drinking consequences (Österling, 1997).

### *Mental illness and suicidal behaviour*

The subject responded (yes/no) to the questions about whether a doctor had ever treated her for a *mental disorder or nervousness*, whether she had ever had *suicidal thoughts*, whether she had had suicidal thoughts in the last year, whether she had ever *attempted suicide*, and whether she had attempted suicide in the last year.

## **Attrition analysis**

The response rate to the questions in the basic questionnaire varied from 95.7% to 100%.

Response rate in the additional questionnaire varied from 93.3% to 98.6%, except for the two questions about binge drinking, where the response rate ranged from 74.3% to 79.0%.

## **Paper I - Weekly alcohol consumption**

Two hundred and ninety-four women (4.3%) did not answer the question about weekly alcohol consumption. These women were older (mean age  $56.8 \pm 2.9$  vs.  $56.4 \pm 3.0$ ,  $p < 0.05$ ) compared to the other 6,623 women. Furthermore, they less often had university education (22.2% vs. 35.3%,  $p < 0.001$ ), were more often granted a disability pension (13.9% vs. 8.2%,  $p < 0.05$ ), and were more often smokers (28.1% vs. 20.6%,  $p < 0.01$ ). Of the physical symptoms they were bothered more often by sweating (37.7% vs. 31.5%,  $p < 0.05$ ), pain in the legs (51.1% vs. 44.3%,  $p < 0.05$ ) and nausea (19.2% vs. 12.4%,  $p < 0.01$ ), but they were less often bothered by the mental symptom exhaustion (34.5% vs. 42.7%,  $p < 0.01$ ).

To sum up, there were some indications of poorer social situation and poorer physical health

in non-responders, but no indications of poorer mental health.

## **Paper II - Severity of mental symptoms**

One hundred and eighty-two subjects (2.6%) responded to fewer than eight out of the ten questions about mental symptoms. These women less often had university education (24.4% vs. 35.1%,  $p < 0.05$ ), more often had been granted a disability pension (16.2% vs. 8.3%,  $p < 0.01$ ), were more often immigrants (13.7% vs. 8.6%,  $p < 0.05$ ), more often used hypnotics regularly (3.3% vs. 1.1%,  $p < 0.01$ ) and more often underwent medical control for mental reasons (4.9% vs. 1.6%,  $p < 0.01$ ) compared to the other 6,735 women.

Consequently, there were some indications of a poorer social situation and poorer mental health among non-responders.

## **Paper III - Immigrant women**

When analysing country of birth, 21 women (0.3%) were excluded since they stated being born abroad but did not say in which country. When analysing their age at immigration another 43 women were excluded since they did not say when they had immigrated. No attrition analyses were performed.

## **Paper IV – Binge drinking**

The 115 subjects (abstainers excluded) who did not answer the question about binge drinking in the last year less often had university education (15.7% vs. 31.2%,  $p < 0.001$ ), but did not differ on any other item compared to the 332 women answering the question.

## ***Women receiving the additional questionnaire***

Five hundred and thirteen subjects received the additional questionnaire. These women were older (mean age  $58.4 \pm 3.0$  vs.  $56.3 \pm 2.9$ ,  $p < 0.001$ ) compared to the other 6,404 women. In addition, they more often lived with a partner (75.8% vs. 60.4%,  $p < 0.001$ ), less often had a university education (25.9% vs. 35.5%,  $p < 0.001$ ), more often were granted a disability pension or on long-term sick leave (17.7% vs. 7.8% and 3.7% vs. 1.9%,  $p < 0.001$ , respectively), more often had regular medication (56.7% vs. 49.1%,  $p < 0.01$ ), and more often had medical control (41.7% vs. 35.9%,  $p < 0.05$ ).



To sum up, the women who received the additional questionnaire differed in some aspects regarding social situation and had some indications of poorer physical health, but did not differ in terms of alcohol consumption or mental health.

## **Statistics**

All statistical analyses were performed using SPSS (Norusis, 1995); in Paper I version 7.0, Paper II version 11.5, Paper III version 12.0 and Paper IV version 15.0. The level of statistical significance was set to  $p < 0.05$ .

The chi-square test and, when required, Fisher's exact test, were used in all papers to analyse differences in proportions. As continuous variables were judged to be non-normally distributed, non-parametric tests were applied: Mann-Whitney U-test (for two-group comparisons) and Kruskal-Wallis test (for three and four-group comparisons).

In analyses of relation between employment and other variables, old-age pensioners ( $n=20$ ) were excluded in all papers, in addition students ( $n=34$ ) were excluded in Papers II, III and IV.

In Paper I bivariate logistic regression analyses were used to evaluate the relationship between the dependent variable "non-drinking/weekly drinking" and independent variables. Risk factors for non-drinking vs. weekly drinking were assessed and expressed as odds ratios (OR) with 95% confidence intervals (CI).

Variables that in bivariate analyses were significantly associated with non-drinking were entered into a multivariate logistic regression model (forward, likelihood ratio method) controlling for age. Age was converted into three equal-sized groups.

In Paper II the same technique was used to evaluate the relationship between the dependent variable mental symptoms (severe vs. absent/slight), and independent variables. Variables that in bivariate analyses were significantly associated with mental symptoms were entered into a multivariate logistic regression model (forward, likelihood ratio method) controlling for age. Age was converted into three equal-sized groups. The variables "medications" and "medical control" were not included in the model since they were considered to have an evident connection with severe mental symptoms. The Hosmer and Lemeshow test was used to

evaluate the goodness-of-fit of the model.

In Paper III, in the analyses of country of birth, each immigrant group (Finnish, Nordic, Eastern European, Western European, and non-European) was compared with Swedish-born women.

In the analyses of age at immigration, the immigrant groups were merged into Nordic, European and non-European, and respectively compared.

To analyse the association between country of birth and alcohol consumption and mental health, four separate multivariate logistic regression analyses were performed: mental symptoms, use of hypnotics (use vs. no use), use of antidepressants (use vs. no use), and alcohol consumption (non-drinking vs. weekly drinking). The first three analyses mentioned were performed controlling for age, alcohol consumption, household, level of education, employment, visiting friends, severity of physical symptoms, and use of hormone replacement therapy. The final analysis mentioned (alcohol consumption) was performed controlling for age, severity of mental symptoms, use of anxiolytics, use of hypnotics, use of antidepressants, household, level of education, employment, visiting friends, severity of physical symptoms, and use of hormone replacement therapy. The Hosmer and Lemeshow test was used to evaluate the goodness-of-fit of the model.

In Paper IV variables showing significant, bivariate association with drinking to relieve tension (compared with other drinkers) were entered into a multivariate logistic regression model (forward, likelihood ratio method). Variables showing significant association when comparing abstainers, occasional drinkers and weekly drinkers were entered into a multinomial logistic regression model as the categorical dependent outcome had more than two levels. The weekly drinkers group was chosen as reference group.

# RESULTS

## Participants

A general description of the social situation and physical health in all women participating in the study is presented. The items regarding alcohol use and mental health will be presented in the papers.

Social situation	Physical health
<p><i>Civil status</i></p> <p>Married 72%</p> <p>Divorced 16.3%</p> <p>Unmarried 6.7%</p> <p>Widowed 5.0%</p> <p><i>Household composition</i></p> <p>With partner 61.6%</p> <p>Alone 18.2%</p> <p>With partner and child 15.5%</p> <p>Single parent 3.8%</p> <p>With parents/other 0.8%</p> <p><i>Children</i></p> <p>Mean age at childbirth 25.0±4.4 years</p> <p>Mean number of children 2.2± 0.9</p> <p><i>Highest level of education</i></p> <p>Comprehensive school 24.6%</p> <p>Upper secondary school 40.6%</p> <p>University education 34.8%</p> <p><i>Employment</i></p> <p>Works full-time 52.5%</p> <p>Works part-time 29.8%</p> <p>Disability pension 8.4%</p> <p>Unemployed 4.3%</p> <p>Long-term sick leave 2.0%</p> <p>Housewife 2.2%</p> <p><i>Social network</i></p> <p>Visit friends at least once a month 91.6%</p> <p><i>Immigrant</i></p> <p>Born in another country 8.7%</p>	<p><i>Diseases</i></p> <p>Hypertension 17.4%</p> <p>Thrombosis 4.2%</p> <p>Diabetes 2.3%</p> <p>Cerebral haemorrhage/stroke 0.9%</p> <p><i>Smoking</i></p> <p>Current smoker 20.2%</p> <p><i>Medications and medical control</i></p> <p>Regular medication 49.7%</p> <p>Medical control for mental reasons 1.7%</p> <p>Medical control for physical reasons 34.2%</p> <p>Hospitalised within the last 5 years 27.3%</p> <p><i>Menopause and HRT</i></p> <p>Post-menopausal 92.9%</p> <p>Use hormone replacement therapy 43.9%</p> <p><i>Physical symptoms</i></p> <p>Backache 49.4%</p> <p>Headache 46.9%</p> <p>Pain in the joints 45.7%</p> <p>Pain in the legs 44.6%</p> <p>Eye-problem 33.6%</p> <p>Sweating 31.7%</p> <p>Dizziness 26.5%</p> <p>Abdominal pain 26.2%</p> <p>Feeling cold 24.9%</p> <p>Coughing 23.6%</p> <p>Impaired hearing 23.1%</p> <p>Breathlessness 22.0%</p> <p>Chest pain 19.4%</p> <p>Constipation 14.6%</p> <p>Diarrhoea 13.7%</p> <p>Nausea 12.7%</p> <p>Loss of appetite 3.9%</p> <p>Difficulty in passing urine 3.7%</p> <p>Loss of weight 2.1%</p>

## ***Paper I: Alcohol consumption among middle-aged women: a population-based study of Swedish women***

### **Quantity and type of alcohol consumed**

Regarding alcohol consumed in an ordinary week, 26.0% of the women (n=1,722) stated no alcohol, 57.4% (n=3,800) low consumption (less than 7 drinks), 12.5% (n=826) moderate consumption (7-13 drinks), and 4.2% (n=275) heavy consumption (at least 14 drinks).

Among all women drinking alcohol weekly, the median consumption was 40.0 g alcohol (range 2.5-1036.0), mean  $62.2 \pm 62.9$  g. Wine represented 71.2% of the total grams of alcohol consumed, beer 17.0% and liquor 11.8%. In all groups wine was the dominant beverage (68%-76%). This was most pronounced among moderate drinkers.

### **Drinking categories related to social situation and health**

Comparing the four drinking groups the main differences were found between the non-drinkers and the three groups of weekly drinkers.

Comparing low, moderate and heavy drinkers few significant differences were found. Low drinkers more often had comprehensive school or upper secondary school as highest level of education, while moderate drinkers more often had university education. Low drinkers had somewhat more physical symptoms and heavy drinkers somewhat more mental symptoms. Moderate drinkers less often had been hospitalised at any time during the last five years, and when so they had been hospitalised fewer days. Moderate and heavy drinkers more often were smokers.

Comparing non-drinkers and weekly drinkers (i.e. low, moderate and heavy drinkers taken together) no distinct differences were found regarding mental health, while all items regarding social situation and nearly all items regarding physical health revealed a more unfavourable situation for non-drinkers (presented as odds ratios in Table 1). A multivariate analysis, adjusted for age, was performed to gain more understanding of the associations between non-drinking and independent significant variables, i.e. social situation and health (presented in Table 1). All differences in social situation remained significant except civil status.

Concerning differences in health, only diabetes, regular medical control, and two physical symptoms remained significant.

**Table 1: Drinking categories related to social situation and health**

	Non- drinkers n=1722 %	Low drinkers n=3800 %	Moderate drinkers n=826 %	Heavy drinkers n=275 %	OR (95% CI) <sup>1</sup>	OR (95% CI) <sup>2</sup>
<b>Social situation</b>						
Civil status						
Married	65.5	74.8	73.6	72.7	1.0	1.0
Unmarried	8.7	5.6	7.0	6.9	1.7 (1.4-2.1)	NS
Divorced	18.6	15.3	15.1	16.7	1.4 (1.2-1.6)	NS
Widowed	7.1	4.4	4.2	3.6	1.9 (1.5-2.4)	NS
Household						
With partner	56.5	63.3	64.0	65.7	1.0	1.0
Alone	24.4	16.0	15.4	15.3	1.7 (1.5-2.0)	1.8 (1.5-2.1)
With partner and child	13.6	16.6	16.1	13.5	NS	1.2 (1.0-1.5)
Single parent	4.7	3.5	3.4	4.7	1.5 (1.1-2.0)	2.2 (1.6-3.0)
With parents or other	0.8	0.7	0.1	0.7	NS	NS
Level of education						
University education	24.2	36.5	49.6	44.6	1.0	1.0
Upper secondary school	37.8	42.9	37.0	39.5	1.5 (1.3-1.7)	1.4 (1.2-1.6)
Comprehensive school	38.0	20.6	13.4	15.9	3.2 (2.8-3.7)	2.9 (2.4-3.4)
Employment						
Full time/part time work	73.2	85.8	87.4	85.0	1.0	1.0
Student	0.6	0.5	0.5	0.7	NS	NS
Unemployed	4.9	3.9	3.8	5.2	1.4 (1.1-1.9)	NS
Disability pension	15.5	5.9	5.3	4.9	3.2 (2.7-3.8)	2.1 (1.6-2.6)
Long-term sick leave	3.5	1.6	1.1	1.5	2.7 (1.9-3.8)	2.1 (1.4-3.3)
Housewife	2.3	2.3	1.9	2.6	NS	NS
Immigrant	11.1	7.6	7.3	10.2	1.5 (1.3-1.8)	1.3 (1.0-1.7)
<b>Health</b>						
Hypertension	21.0	16.0	15.9	16.8	1.4 (1.2-1.6)	NS
Diabetes	3.9	1.9	1.2	1.8	2.8 (1.6-3.1)	1.9 (1.2-2.8)
Thrombosis	5.3	3.8	2.9	4.4	1.5 (1.1-1.9)	NS
Heart attack	1.8	0.7	0.7	0.4	2.5 (1.5-4.0)	NS
Cerebral haemorrhage/stroke	1.4	0.8	0.4	1.1	2.0 (1.2-3.3)	NS
Regular medical control	45.1	33.2	32.0	37.7	1.7 (1.5-1.8)	1.2 (1.1-1.4)
Regular medication	54.7	48.0	46.0	51.5	1.3 (1.2-1.5)	NS
Hospitalised (5 years)	31.6	26.3	22.8	30.6	1.3 (1.2-1.5)	NS
Current smoker	22.0	18.2	23.3	35.7	1.1 (1.0-1.3)	NS
Symptoms <sup>A</sup>						
Breathlessness	27.7	20.4	17.5	22.6	1.5 (1.3-1.7)	1.2 (1.0-1.4)
Pain in the legs	52.2	42.6	37.3	39.9	1.5 (1.4-1.7)	1.3 (1.1-1.4)

<sup>1</sup> Odds ratio (95% confidence interval) of non-drinkers (n=1722) vs. weekly drinkers (n=4901)

<sup>2</sup> Multivariate logistic regression analysis of factors associated with non-drinking (n=1722) vs. weekly drinking (n=4901), in first block adjusted for age, in second block including all significant items.

<sup>A</sup> Only the symptoms that remained significant in the multivariate logistic regression analysis are presented in the table. In the bivariate analysis non-drinkers had also higher odds for the following physical symptoms (range OR 1.1-1.8); eye-problem, headache, dizziness, coughing, chest pain, breathlessness, loss of weight, sweating, feeling cold, backache, pain in the joints, abdominal pain, nausea, loss of appetite and difficulty in passing urine, but none of these symptoms remained significant in the multivariate logistic regression analysis. In the bivariate analysis non-drinkers had also higher odds for the following mental symptoms (range OR 1.1-1.6); nervousness, general fatigue, depression and cries easily, and lower odds (range OR 0.8-0.9) for the symptoms exhaustion and difficulty in relaxing, but none of the mental symptoms remained significant in the multivariate logistic regression analysis.

## ***Paper II: Few middle-aged women with severe mental symptoms use psychotropic drugs: The Women's Health in Lund Area (WHILA) Study***

### **Mental symptoms and psychotropic drug use**

Mental symptoms were common. Of the 6,735 women, general fatigue was reported by 60.5%, depression by 53.4%, difficulty in relaxing 44.7%, sleeping disturbance 43.7%, irritability 42.5%, exhaustion 42.1%, restlessness 32.7%, impaired concentration 30.8%, cries easily 29.0% and nervousness by 18.0%.

Symptom severity was calculated based on the sum of confirmed symptoms; 25.4% of the women (n=1,709) had been troubled by 0-1 symptom ("Absent/Slight"), 52.8% (n=3,555) by 2-6 symptoms ("Moderate") and 21.8% (n=1,471) by 7-10 symptoms ("Severe").

Of all women in the study, 7.0% regularly used a psychotropic drug, mainly antidepressants. Combinations of different kinds of psychotropic drugs were rare. In women with severe mental symptoms 15.4% used a psychotropic drug, mainly antidepressants (used by 11.0%), and 4.1% had regular medical control for mental reasons.

Except for anti-epileptics, women with severe mental symptoms more often used all kinds of psychotropic drugs compared to women with absent/slight symptoms. Accordingly, women with severe mental symptoms more often had medical control for mental as well as physical reasons.

### **Symptom severity related to alcohol consumption, social situation and physical health**

The level of weekly alcohol consumption did not differ between women with severe mental symptoms and women with absent/slight symptoms. However, the two groups of women differed on all items regarding social situation and on several items regarding physical health (presented as odds ratios in Table 2). Severe mental symptoms were strongly associated with severe physical symptoms. In both groups different forms of "pain symptoms" were the most common symptoms.

A multiple logistic regression analysis, adjusted for age, was performed to gain more understanding of the associations between severe mental symptoms vs. absent/slight symptoms, and independent significant variables (presented in Table 2). The very strong association between severe mental symptoms and severe physical symptoms remained. In addition, most differences regarding social situation remained.

**Table 2: Symptom severity related to alcohol consumption, social situation and physical health**

	Absent/Slight n=1709 %	Moderate n=3555 %	Severe n=1471 %	OR (95% CI) <sup>1</sup>	OR (95% CI) <sup>2</sup>
<b>Alcohol consumption</b>					
None	25.7	25.1	27.8	1.0	-
Low	57.3	58.9	54.0	NS	-
Moderate	13.4	12.0	12.9	NS	-
Heavy	3.7	4.0	5.3	NS	-
<b>Social situation</b>					
Household					
With partner	67.0	61.0	56.2	1.0	1.0
Alone	14.8	18.5	21.8	1.8 (1.5-2.1)	1.7 (1.3-2.2)
With partner and child	14.8	15.7	6.1	1.3 (1.1-1.6)	1.4 (1.0-1.9)
Single parent	2.8	3.9	4.9	2.1 (1.4-3.0)	2.1 (1.2-3.6)
With parents or other	0.6	0.8	1.0	NS	NS
Level of education					
Comprehensive school	26.9	24.0	22.6	1.0	1.0
Upper secondary school	43.0	39.2	40.8	NS	NS
University education	30.1	36.8	36.6	1.5 (1.2-1.7)	1.5 (1.1-2.0)
Employment					
Full time/part time work	84.9	85.0	76.9	1.0	1.0
Unemployed	4.5	4.2	4.3	NS	NS
Disability pension	6.2	7.6	12.2	2.2 (1.7-2.8)	NS
Long-term sick leave	0.4	1.5	5.3	15.8 (6.9-36.1)	8.8 (3.0-25.5)
Housewife	4.0	1.7	1.3	0.4 (0.2-0.6)	0.3 (0.2-0.8)
Not visiting friends $\geq$ once/month	5.5	7.9	12.6	2.5 (1.9-3.2)	2.1 (1.4-3.0)
Immigrant	6.1	8.0	12.6	2.2 (1.7-2.8)	NS
<b>Physical health</b>					
Current smoker	18.7	21.0	23.0	1.3 (1.1-1.5)	NS
Pre-menopausal	7.9	7.0	6.6	0.8 (0.6-1.1)	-
Hormone replacement therapy	39.4	44.0	49.6	1.5 (1.3-1.8)	1.3 (1.1-1.6)
Physical symptoms					
Absent/Slight	58.9	25.3	7.9	1.0	1.0
Moderate	39.0	59.0	49.2	9.4 (7.6-11.7)	9.2 (7.2-11.7)
Severe	2.2	15.7	42.9	147.8 (100.7-216.8)	136.8 (89.2-209.7)
Hypertension	15.5	16.9	20.4	1.4 (1.2-1.7)	NS
Diabetes	2.1	2.3	2.5	NS	-
Thrombosis	3.9	4.1	4.5	NS	-
Heart attack	0.9	1.0	1.0	NS	-
Cerebral haemorrhage/stroke	0.4	0.9	1.2	2.9 (1.2-6.9)	NS

<sup>1</sup> Odds ratio, 95% confidence interval, of women with severe mental symptoms (n=1471) vs. absent/slight mental symptoms (n=1709)

<sup>2</sup> Multiple logistic regression analysis of factors associated with severe mental symptoms (n=1471) vs. absent/slight mental symptoms (n=1709), in first block adjusted for age, in second block including all significant items presented in table.

### ***Paper III: Mental symptoms, psychotropic drug use and alcohol consumption in immigrated middle-aged women. The Women's Health in Lund Area (WHILA) Study***

#### **Country of birth**

Of the total number of participants, 91.6% (n=6316) were born in Sweden, 1.5% (n=102) in Finland, 1.6% (n=109) in another Nordic country, mainly Denmark, 2.1% (n=145) in Eastern Europe, mainly Poland and Hungary, 2.0% (n=141) in Western Europe, mainly Germany, and 1.2% (n=83) outside Europe.

#### **The immigrants' social situation and health**

Each immigrant group respectively was compared with the women born in Sweden. All groups, except the Nordic immigrants, differed on some items regarding social situation, revealing a more unfavourable situation for the immigrants, such as living alone or as single parent, being granted a disability pension or being unemployed, and not visiting friends. However, Eastern European and non-European immigrants more often had university education. In addition, the women in all immigrant groups, except for the Nordic immigrants, were more often troubled by severe physical symptoms.

#### **Country of birth related to mental symptoms, psychotropic drug use and alcohol consumption**

Comparing each immigrant group with women born in Sweden it was found that severe mental symptoms more often troubled women born in Eastern Europe (39% vs. 21%,  $p<0.001$ ), Western Europe (36% vs. 21%,  $p<0.001$ ) and outside Europe (30% vs. 21%,  $p<0.05$ ). Furthermore, Nordic immigrants more often used hypnotics (5% vs. 1%,  $p<0.01$ ) and antidepressants (9% vs. 5%,  $p<0.05$ ), and non-European immigrants more often were non-drinkers of alcohol (58% vs. 25%,  $p<0.001$ ).

The association between country of birth on one hand and alcohol consumption and mental health on the other hand was further analysed using four separate multivariate logistic regression analyses: severe mental symptoms vs. absent/slight symptoms, use of hypnotics vs. no use, use of antidepressants vs. no use, and non-drinking vs. weekly drinking, controlling for age and possible confounders. Nordic immigrants remained associated with use of hypnotics (OR 4.4, CI 1.5-12.9), Eastern European and non-European immigrants associated



with non-drinking of alcohol (OR 1.6, CI 1.0-2.5 and OR 3.8, CI 2.3-6.5). No immigrant group remained associated with severe mental symptoms or use of antidepressants.

### Age at immigration related to mental symptoms, psychotropic drug use and alcohol consumption

In all groups the women were in their twenties (mean value) when immigrating to Sweden, except the non-European immigrants who were older ( $38.3 \pm 10.7$ ). Age at immigration was divided into three groups: <18 years, 18-34, and  $\geq 35$  years.

When analysing the possible influence of age at immigration, the women were categorised as Nordic, European, and non-European immigrants. For Nordic immigrants, age at immigration was not associated with mental symptoms, psychotropic drug use or alcohol consumption. For European immigrants, those who immigrated before the age of 18 were less often troubled by severe mental symptoms, but they were more often moderate or heavy drinkers, whereas those who were 35 years or older were more often non-drinkers. Among non-European immigrants, subjects 18-34 years old at immigration were more often heavy-drinkers, whereas those 35 years or older were more often non-drinkers (presented in Table 3).

**Table 3: The influence of age at immigration on mental symptoms and alcohol consumption,**

	Nordic			European			non-European		
	<18	18-34	$\geq 35$	<18	18-34	$\geq 35$	<18	18-34	$\geq 35$
	n=56 %	n=108 %	n=24 %	n=63 %	n=150 %	n=57 %	n=2 %	n=27 %	n=50 %
<b>Mental symptoms</b>			NS			<0.05			NS
Absent/Slight	16	29	30	21	14	4	50	23	7
Moderate	54	52	44	54	46	51	50	58	55
Severe	30	19	26	25	40	45	0	19	39
<b>Alcohol consumption</b>			NS			<0.001			<0.01
None	22	31	32	15	33	46	0	35	69
Low	55	52	68	54	56	40	100	46	22
Moderate	24	12	0	18	6	10	0	8	8
Heavy	0	5	0	13	6	4	0	12	0

The chi-square test was used. Age at immigration was compared within Nordic immigrants, European immigrants, and non-European immigrants, respectively.

# ***Paper IV: Abstinence, occasional drinking and binge drinking in middle-aged women. The Women's Health in Lund Area (WHILA) Study.***

## **Abstainers and occasional drinkers**

Of the women who answered the additional questionnaire, 10.4% were abstainers, 22.0% occasional drinkers and 67.5% weekly drinkers. Comparing the three groups, it was found that that abstainers and occasional drinkers more often had comprehensive school as the highest level of education. Furthermore, abstainers more often had disability pension, regular medical control and regular use of psychotropic drugs.

Further information about these findings was obtained using a multinomial logistic regression analysis with all significant items included. Lower level of education and having regular medical control were significantly associated with being an abstainer or an occasional drinker compared to being a weekly drinker. Furthermore, being granted a disability pension was significantly associated with being an abstainer compared to being a weekly drinker (presented in Table 4).

**Table 4: Multinomial logistic regression analysis of abstainers, occasional drinkers and weekly drinkers.**

	Abstainers n=52		Occasional n=110		Weekly n=337
	%	OR (95% CI)	%	OR (95% CI)	%
<b>Social situation <sup>A</sup></b>					
Education					
University education	12.5	1.0	13.6	1.0	31.7
Upper secondary school	16.7	0.6 (0.2-2.0)	35.0	2.0 (0.9-4.3)	42.9
Comprehensive school	70.8	5.0 (1.9-13.3)	51.5	4.9 (2.3-10.3)	25.5
Employment					
Full time/part time work	49.0	1.0	69.5	1.0	77.1
Unemployed	2.0	0.7 (0.1-6.0)	1.1	0.2 (0.0-1.5)	5.2
Disability pension	39.2	2.9 (1.3-6.6)	23.2	1.2 (0.6-2.3)	12.7
Long-term sick leave	5.9	3.0 (0.6-14.1)	6.3	2.1 (0.6-6.9)	2.3
<b>Mental and physical health <sup>A</sup></b>					
Regular medical control	60.8	2.3 (1.1-4.8)	49.1	2.0 (1.2-3.3)	36.3
Regular psychotropic drug use	15.4	2.5 (0.9-7.1)	10.9	1.6 (0.6-4.2)	5.9

The chi-square test was used to compare abstainers, occasional drinkers and weekly drinkers.

<sup>A</sup> No significant differences were found regarding the following items; household, immigrant status, visiting friends  $\geq$  once/month, severity of mental symptoms, severity of physical symptoms, regular medication, current smoker, treatment for mental disorder ever, suicidal thoughts ever, suicidal thoughts last year, suicide attempt ever, suicide attempt last year. The items that were significant were included in the multinomial logistic regression analysis and are presented in the table. In the multinomial logistic regression analysis the reference category was weekly drinkers.

Looking at frequency and quantity of alcohol use among occasional drinkers the majority, 79.1%, drank once a month or less, the others 2-4 times a month. On a typical drinking day nearly all, 91.4%, had 1-2 drinks.

### **Binge drinkers**

Binge drinking during the last year was reported by 56.6% of women drinking alcohol. Among them, the mean number of days of binge drinking last year was  $22.0 \pm 41.3$ , median 6.0 (range 1-330). Binge drinking during the last month was confirmed by 39.4% of women drinking alcohol. In this group, the mean number of days of binge drinking in the last month was  $3.4 \pm 4.0$ , median 2.0 (range 1-31).

Comparing women reporting binge drinking during the last year with other drinkers (i.e. abstainers excluded), no significant differences in social situation, mental or physical health (items specified in Table 4) were found. The same was true for the comparison between women binge drinking during the last month and the other drinkers.

Looking at level of weekly alcohol consumption, not unexpectedly, women binge drinking last year more often were moderate and heavy drinkers (14.4% vs. 3.6% and 7.2% vs. 1.5%,  $p < 0.001$ ), this also was evident in women binge drinking last month (15.0% vs. 7.8% and 12.0% vs. 1.0%,  $p < 0.001$ ).

### **Drinking to relieve tension**

Thirty-eight of the women drinking alcohol affirmed one or more of the four items that may indicate possible problem drinking. Drinking to relieve tension was affirmed by 31 women (7.2%). Very few affirmed any of the other items: 7 worried about drinking consequences, 4 expressed marked resentment when drinking, and 2 drank to overcome feelings of inferiority. Women drinking to relieve tension were compared with other drinkers (i.e. abstainers excluded) in terms of the items specified in Table 4. Women with severe mental symptoms as well as women not visiting friends monthly were more often drinking to relieve tension (40.0% vs. 20.4%,  $p < 0.01$  and 25.8% vs. 5.0%,  $p < 0.001$ , respectively. In a multivariate logistic regression analysis, both these variables remained significant: severe mental symptoms OR 6.1, CI 1.3-29.0; not visiting friends monthly OR 4.2, CI 1.5-11.4.

Level of weekly alcohol consumption and binge drinking were also investigated. Women drinking to relieve tension were more often moderate drinkers (30.0% vs. 8.5%,  $p = 0.001$ ), and they had been binge drinking more often during the last year (81.8% vs. 55.3%,  $p < 0.05$ ) as well as during the last month (65.4% vs. 37.3%,  $p < 0.01$ ).

**Mental illness and suicidal behaviour**

Of all the women in the study, 16.2% affirmed that, during their lives, they had been treated by a doctor for a mental disorder or nervousness, 10.1% reported that they had experienced suicidal thoughts sometime during their lives and 2.4% in the last year, 3.0% had made suicide attempts sometime during their lives, but none within the last year.

None of these items were found to be associated with the women's use of alcohol in the analyses described above.

## DISCUSSION

### ***Methodological considerations***

The WHILA study was primarily designed to study different physical health problems such as cardiovascular diseases, diabetes, osteoporosis, and incontinence. The study was already planned and data collection was in progress when a general discussion arose on analysing items relating to alcohol consumption and mental health. We considered the topic to be of great interest due to the magnitude of the material - nearly 7,000 women participated - and since research in this particular population was scarce. Furthermore, for slightly more than 500 women it was possible to supplement the information with additional questions about alcohol use and mental illness.

It should be emphasised that the study design is cross-sectional, making it possible to look for associations rather than establishing causality.

### ***Representativity***

All women aged 50-59 living in the Lund area of southern Sweden were invited to participate in the WHILA study. The study was conducted between 1995 and 2000. During the study period and since then there have been changes regarding both alcohol use and mental health in the Swedish population. Possible influences will be discussed in conjunction with the findings.

Out of 10,766 women, 6,917 (64.2%) participated. The response rate in health surveys varies substantially. In this study the women were to both answer a postal questionnaire and participate in a medical examination. The response rate in this study was similar to a study that also included both postal questionnaire and medical examination (Harris et al, 1987), but lower than a study that was based on only a postal questionnaire (Krantz & Östergren, 2002). Data pertaining to the women participating in the WHILA study was compared to data from Statistics Sweden of all women aged 50-59 years and living in Sweden in 1999. The figures do not allow exact comparisons but indicate that women participating in the WHILA study more often were married (72.0% vs. 64.1%), had a university education (34.8% vs. 27.6%), and more often were employed (82.3% vs. 77.6%). In addition, women in the WHILA study

less often were immigrants (8.7% vs. 12.5%). These figures indicate that the participants in the present study were not fully representative of Swedish women of the same age.

### **Non-participants**

In several population-based studies, analysis of non-participants shows that they have a higher mortality rate, poorer health, and lower socio-economic status than participants (Drivsholm et al, 2006). Regarding alcohol consumption, some studies do not support the common view that non-respondents drink more than respondents (Gmel, 2000). Regarding alcohol-related problems, most studies show that this is more common among non-participants (Romelsjö, 1989; Rosengren et al, 1987), although there are contradictory findings (Spak & Hällström, 1995).

In the WHILA study, the analysis of characteristics of non-participants (presented in Methods) shows a higher mortality rate and indications of lower socio-economic status and poorer mental health among non-participants. We have no data on alcohol consumption among non-participants, but we can not rule out the possibility that there are more women with alcohol problems among them.

### **Internal attrition**

In the WHILA study, the internal attrition was low, despite a rather comprehensive questionnaire, probably because a specially trained nurse/midwife addressed potential problems in answering the questionnaire at the time of the examination.

The attrition analyses performed (presented in Methods) reveal some indications of poorer social situation and health among those not answering the questions on alcohol consumption (4.3% of the women) and mental symptoms (2.6% of the women). However, due to the small numbers, this probably does not exert a major influence on the findings.

### **Subjects receiving the additional questionnaire**

The additional questionnaire, which forms the basis of Paper IV, was distributed to the final 513 women participating. These women differed in some aspects regarding social situation and they also showed some indications of poorer health compared to the other participants (analysis presented in Methods). It is of course unfortunate that the additional questionnaire was not received by all women or by a representative sample. However, there are no indications that the women receiving the additional questionnaire differ from the others in terms of alcohol consumption or mental health.

## **Measurements**

### **Alcohol consumption**

To investigate alcohol consumption the women were asked “How much alcohol do you drink in an ordinary week?”, and to report the quantity of glass/bottles (specified in centilitres) of different sorts of wine, beer and spirits respectively, or the option “no alcohol”.

Underestimation is a well-known problem in population surveys of self-reported alcohol consumption. Comparisons of different measures show that some result in higher estimates than others (Fonager & Sabroe, 2001; Heeb & Gmel 2005; Lahaut et al, 2003; Stockwell et al, 2004), but no single best way has been established since each measure has strengths and limitations. When estimating consumption during a normal week it has been shown to yield higher coverage rates if the week is divided into units (Monday-Thursday, Friday, Saturday and Sunday) (Kuhlhorn & Leifman, 1993), which was not done in this study. However, asking specifically about intake of beer, wine, and liquor, as in this study, has been found to result in 20% higher estimates of intake (Feunekes et al, 1999). Underreporting of alcohol intake is common for all available methods. However, if each individual underreports to a reasonably similar degree, the level of alcohol intake is underestimated but the ranking is correct. The ranking capacity has been found satisfactory for most methods. Thus, population-based studies can validly identify associations between alcohol, health and disease (Feunekes et al, 1999).

Thus, due to the general underestimation that occurs in population-based studies, and the difficulties relating to the measurement used in this study, the women’s alcohol consumption is probably underestimated. Nevertheless, the associations found to social situation and health can be accurate.

### **Abstinence**

In the additional questionnaire the women were asked about their usual frequency and quantity of drinking, and so the non-weekly drinkers could be divided into abstainers and occasional drinkers (as described in Methods). The importance of separating lifetime abstainers and former drinkers has been stressed (Fillmore et al, 1998a; Stranges et al, 2006), but this could not be done in the present study. Nor was the reason for not drinking alcohol investigated.

## **Binge drinking and problem drinking**

Binge drinking was investigated in the additional questionnaire. Binge drinking was defined as having at least four drinks in one day. The threshold of four drinks has been considered suitable for women (Andréasson & Allebeck, 2005; Wechsler et al, 1995). It is possible that the prevalence of binge drinking and the associations to other characteristics found would have been different if the question had been about four drinks on one occasion. However, we assume such possible differences to be of minor importance.

In the additional questionnaire, questions were asked about some indications of possible problem drinking that have been found to be pertinent to the female problem drinker (Österling, 1997). However, confirming any of these items is not equivalent to establishing problem drinking, and lack of confirmation does not eliminate the possibility of problem drinking. Moreover, in this study, diagnosis of alcohol dependence or alcohol abuse was not investigated.

## **Levels of alcohol consumption**

A problem when comparing study results is that many studies vary in the cut-off levels for drinking categories. The cut-off levels can be expressed as grams of ethanol or, more often, as number of standard drinks/units. The size of a standard drink varies in different countries; e.g. in the United Kingdom 8 g, in Australia 10 g, in the United States 14 g (ICAP, 2003). In Sweden one drink is often defined as containing 12 g (Andréasson & Allebeck, 2005). The cut-off levels in studies are often based on expert reports of risk levels for drinking. In some cases these are expressed as daily limits, in others, as weekly recommendations. In general, values given for men are higher than for women (ICAP, 2003).

According to the WHO (World Health Organisation) <14 units per week is the definition of responsible drinking for women, and this cut-off level is used in several countries, such as Australia, Denmark and the United Kingdom, while in the U.S. the NIAAA (National Institute of Alcohol Abuse and Alcoholism) recommend women not to exceed 7 units a week. However, as the definition of standard drink size varies, 14 units a week corresponds to 112 g according to the WHO and the United Kingdom, but 168 g in Denmark, reducing the difference to the NIAAA level, which is 98 g (ICAP, 2003). In this study heavy drinking was set to  $\geq 14$  drinks/week ( $\geq 168$  g). Drinking below this level was split into low drinking (<7 drinks/week) and moderate drinking (7-13 drinks). The cut-off level used in this study is high according to the most recent recommendations in Sweden, where risk consumption for women is defined as more than 9 drinks a week ( $\geq 109$  g) (Andréasson & Allebeck, 2005).



## **Mental symptoms**

The subject's mental health was investigated with the Göteborg Quality of Life instrument (GQL), in which the respondent answers "yes" or "no" to whether any of ten separate mental symptoms have troubled her during the past three months. The GQL instrument is based on the WHO definition of health. It has been validated to provide a reliable and stable assessment of symptoms, as a useful descriptive tool, to assist in evaluating treatment, and to have predictive power (Tibblin et al, 1990b). It has been used in several population-based studies (Al-Windi et al, 1999; Al-Windi et al, 2002; Bardel et al, 2002; Bengtsson et al, 1987; Ekström & Hovelius, 2000; Ekström et al, 2003; Tibblin et al, 1990a). In this study, the assessment of symptom severity was based on the sum of confirmed mental symptoms. It could be argued that instead of "severe" the terms "many" or "multiple" would be more appropriate. Unfortunately, the subject could not state to what degree the symptom had troubled her (i.e. whether it was mild or more severe), nor could she state how often the symptom had troubled her (i.e. never, seldom, sometimes, often, or almost always). Furthermore, mental diagnosis was not investigated.

## **Psychotropic drug use**

The subject was asked "Do you use any medication/s regularly?". If answering affirmatively, she was asked to list what sort of medications. Medical records were not reviewed. The concordance between information on drug use obtained from questionnaires and from medical records has been found to be fairly good, but also to vary with type of drug (van den Brandt et al, 1991). In particular, it is assumed that the use of psychotropic drugs is underreported, possibly due to the stigma of mental illness. However, substantial agreement between self-reported and physician-reported use of antidepressants has been found (Cotterchio et al, 1999).

In this study only regular use was investigated. Antidepressants are often prescribed for regular use, while anxiolytics and hypnotics could be prescribed for occasional use. In a Swedish study, the prevalence rate of regular use of sedatives or hypnotics was found to be about one-quarter of the rate of current use. Among those who stated regular use, most (75%) were long-term users, compared to 27% of the current users (Blennow et al, 1994).

In our study the number of women using psychotropic drugs regularly is probably underestimated as some may have forgotten or withheld medications used. However, those who stated psychotropic drug use may be long-term users.

## **Immigrant status**

In this study, country of birth and age at immigration were analysed. Second-generation immigrants could not be identified. Due to the small number of immigrants from any specific country (except from Finland) rather broad categorisations had to be made, which increases the risk of inaccurate generalisations.

In addition, the woman's reason for immigration was not asked for. The major types of immigration to Sweden are labour migration and forced migration. These characteristics have varied between countries and over time, as described in the Introduction section (Migrationsverket). Poorer mental health has been found among refugees compared to labour migrants (Sundquist, 1994). In this study, it can be assumed that Finnish, Nordic and Western European immigrants were mainly labour migrants (in the WHILA study only three women from former Yugoslavia had immigrated after the outbreak of war), whereas Eastern European and non-European immigrants were mainly refugees.

Regarding age at immigration, the three categories can be regarded to illustrate different phases in life. A woman in the youngest age group (<18 years) came to Sweden as a minor and maybe together with her siblings and parents, a woman in the intermediate group (18-34) came in her young adulthood when many start to establish a family and a career, and a woman in the oldest age group ( $\geq 35$  years) probably came with a husband and children, and with role expectations based on women's living conditions and social position in her native country.

## **Main findings**

### **Mostly low level of alcohol consumption, but binge drinking is common**

Three out of four middle-aged women drink alcohol weekly. Among the women not drinking weekly, one-third never drink alcohol. The others drink occasionally, in general reporting a very low consumption.

Among all Swedish women, wine constitutes slightly more than half (52%) of the total consumption (CAN, 2006). In the present population of women aged 50-59 wine is even more dominant, representing 71.2% of the total consumption. In contrast to intake of beer and spirits, a low to moderate intake of wine has in some studies been reported to be associated with a reduced total mortality and better self-reported health (Gronbaek et al, 1995; Theobald et al, 2000; 2003). However, conflicting findings exist (Rimm et al, 1996). In the present study, associations between various health parameters and the use of different kinds of beverages were not investigated. Whether or not the large share of wine drinking in the sample studied is of any importance for the results can therefore not be determined.

Most women (57.4%) are low drinkers, defined as having less than 7 drinks/week, and few (4.2%) are heavy drinkers, defined as having  $\geq 14$  drinks/week. According to the most recent definition, consumption of more than 9 drinks a week should probably be regarded as hazardous for women (Andréasson & Allebeck, 2005). In this study 11.4% of the subjects reported their drinking to be of that magnitude.

Despite the fact that most of the women stated their average alcohol consumption to be low, many reported binge drinking, more than half during the last year and 40% during the last month.

When comparing the data on alcohol use in this study with results from other studies, interpretations must be performed with caution due to differences in methodology. According to Statistics Sweden's annual investigation of living conditions (ULF), the mean self-reported alcohol consumption in 1996 among women aged 50-64 could be converted into 2.6 drinks/week (Anders Leifman, personal communication 2007), which is somewhat lower than the 3.8 drinks/week reported by the women in our study. Furthermore, in a representative study carried out in 1998, 17.4% of women aged 50-64 affirmed binge drinking at least once a year, a frequency that is much lower than in our study. The latter difference may at least

partly be explained by a higher cut-off for binge drinking (measured as at least 5 drinks) in the other study (Leifman, 2005). Further, sample selection may also be of importance.

If the present study had been carried out today, it is possible that the figures concerning alcohol consumption would have been higher, due to the increase of alcohol consumption in Sweden since the latter part of the 1990s, not least among women aged 50 or older, and in Skåne County, where these women live (CAN, 2006; Leifman, 2003; 2005). In recent years there has also been some increase in binge drinking among middle-aged women (Leifman, 2005).

### **Non-drinkers have a poorer social situation**

Regarding social situation, several differences were found between non-drinkers and weekly drinkers, all implying a more unfavourable situation among the former. When comparing low, moderate and heavy drinkers, the only difference found was that low drinkers had a lower level of education.

In this population of middle-aged women a strong association between educational level and alcohol consumption was found. Non-drinkers had a lower level of education than women drinking alcohol, a finding also reported from prior studies (Bengtsson et al, 1998; Grant, 1997; Neve et al, 1996; Selin, 2004). In the present study the association between alcohol consumption and level of education is clearly illustrated through a range of drinking categories. Among non-weekly drinkers, one-quarter had university education while the same was true for almost half of the moderate and heavy drinkers. When non-weekly drinkers were separated into abstainers and occasional drinkers, it was clear that abstainers had the lowest educational level.

Alcohol use disorders were not identified in this study. It has been shown that, although the more highly educated are more likely to use alcohol than those with less education, those with least education are more likely to develop alcohol dependence and to persist in dependence once it has developed (Grant, 1997).

Another significant finding in our study was that women not drinking alcohol weekly were more often granted a disability pension or were on long-term sick leave. When non-weekly drinkers were divided into abstainers and occasional drinkers, abstainers only were more often granted a disability pension. Having a disability pension/being on sick leave is based on the person's health situation, but it also has a considerable impact on the social situation, most often negatively, e.g. by impaired economy and reduced social network, that could reduce

drinking opportunities. In this cross-sectional study, causality could not be established, but it seems highly improbable that potentially beneficial health effects of alcohol could explain the finding. Few prospective studies have been carried out on these issues. In one Swedish study of middle-aged men the relative risk for acquiring a disability pension was 1.8 among abstainers and 1.3 among men with high alcohol consumption, compared to men with low alcohol consumption (Månsson et al, 1999). In another longitudinal Swedish study, including both men and women, an increased relative risk was noted for abstainers in general, although sometimes not statistically significant, of having high frequency of absence due to sickness and of receiving a disability pension. For female abstainers no greater risk was found, when adjustment was made for age, socioeconomic group, smoking habits and self-rated health, compared to low drinkers, while an increased risk was found for high consumers and those with indications of problem drinking (Upmark et al, 1999).

In this study, binge drinkers did not differ in terms of social situation compared to other drinkers. In another Swedish study, associations between binge drinking (defined as having  $\geq 5$  drinks on one occasion) and social situation were found, similar for men and women.

Binge drinking was more common among those with upper secondary school education than those with comprehensive school or university education, and among those with high income compared to those with low or average income, but was less common among those not employed (pensioners, students, etc.) compared to manual workers (Selin, 2004). This lack of agreement with our findings may be due to differences in characteristics of the study populations. E.g. we only investigated middle-aged women. Further, the definition of binge drinking used in the present study is lower.

### **Many women are troubled by mental symptoms**

In this population of middle-aged women, many were troubled by mental symptoms, i.e. general fatigue, depression, difficulty in relaxing, sleeping disturbance, irritability and exhaustion. More than 40% reported to be bothered by such symptoms.

The frequencies of mental symptoms found in this study were higher than in other population-based studies of Swedish middle-aged women using the GQL instrument carried out in the 1970s and 80s (Tibblin et al, 1990a; Bengtsson et al, 1987), but similar to a contemporary study (Ekström & Hovelius, 2000). This may be seen as indicating a deteriorating subjective mental health among middle-aged women during the last decades. The prevalence of mental symptoms may be rather similar today as when the WHILA study was performed. There has been an increase in mental health problems in recent years, but mainly involving younger

women (Stefansson, 2006).

### **Severe mental symptoms strongly associated with severe physical symptoms**

Physical symptoms were common, particularly different forms of “pain symptoms”, i.e. backache, headache, and pain in the joints. The association between mental and physical symptoms was very strong. There may be several reasons for this. Some women can simultaneously be troubled by mental and physical health problems, some can have a physical health problem that includes mental symptoms or negatively affects their mental health, and likewise some can have a mental health problem that includes physical symptoms or negatively affects their physical health.

In the Swedish population-based PART study, it was found that among persons in need of mental health care and who have visited a health professional, those with coexisting somatic problems less often received appropriate psychiatric treatment (Forsell, 2006). Thus, the fact that many women with severe mental symptoms also reported severe physical symptoms may have an influence on the finding, discussed below, about psychotropic drugs.

### **Few women with severe mental symptoms use psychotropic drugs**

Few (15.4%) of the women with severe mental symptoms regularly used psychotropic drugs, and even fewer (4.1%) had medical control for mental reasons.

It is well known that a minority of those in need of psychiatric treatment seek help for their problems (Bourdon et al, 1992; Forsell, 2006). The most common reason for this is a feeling of shame (Forsell, 2006). Additionally, having consulted a health professional is not the same as having received appropriate treatment (Forsell, 2006; Ohayon et al, 1999; Ormel et al, 1991). It cannot be excluded, of course, that in some cases the women may have rejected or discontinued suggested treatment.

It may be that somewhat more women with severe mental symptoms use psychotropic drugs today, since there has been an increase in prescriptions of antidepressants to middle-aged women in recent years according to sales statistics (Apoteksbolaget, 2007).

It may also be that some women do not need medical treatment but instead help for psychosocial problems. A large number of symptoms can be an expression of psychosocial stress caused by conditions of life (Krantz, 2000). In Sweden approximately one-third of patients seeking primary health care do so for diffuse or complex symptoms, estimated by the general practitioner as being attributed to psychosocial causes (Karlsson, 2004).

Although this study shows that few women with severe mental symptoms use psychotropic

drugs, we cannot draw the conclusion that *too few* use such drugs. Having severe mental symptoms does not necessarily mean that psychotropic drugs or other treatment is needed. It is not equivalent to having a mental disorder and its clinical significance could not be established in this study. It should be noted, however, that considerable disablement has been associated with symptom levels indicating distress but not reaching levels for formal diagnosis (Korten & Henderson, 2000). Possibly, if mental symptoms could be identified and treated at an early stage, this might prevent cases from developing into mental disorders (Horwath et al, 1994), as well as preventing future sickness absence/disability pension (Krantz & Östergren, 2002).

### **Immigrants do not differ regarding mental health compared to Swedish-born**

In this study it was found that immigrated women were not troubled by severe mental symptoms more often than the women who were born in Sweden, when controlling for social situation and health. This finding is in contrast to several studies that have found poorer mental health among immigrants compared to native Swedes (Bayard-Burfield et al, 2001; Iglesias et al, 2003; Sundquist, 1994; Westman et al, 2003). Furthermore, in contrast to previous studies, non-European immigrants did not have a higher use of psychotropic drugs (Bayard-Burfield et al, 2001; Hjern, 2001; Bayard-Burfield, 1999). Differences between populations studied might explain some of the lack of agreement. The immigrated women in this study were socially well-established, 75% were employed and more than 40% had a university education. In addition, most of the immigrants in this study were young when they came to Sweden, i.e. they have had a long stay in the new country, something that has been found to be favourable for mental health (Angel et al, 2001). Not unexpectedly, Eastern Europeans and non-Europeans were more often non-drinkers, and this was most evident among those who immigrated later in life.

### **Few associations between alcohol use and mental health**

The association between alcohol consumption and health is complex and multidimensional (Room et al, 2005). It is evident that people who drink alcohol heavily are at increased risk for a number of health problems, but it has also been shown that not drinking alcohol can be associated with increased mortality and poorer physical health (NIAAA, 2000; Poikolainen, 1995; Poikolainen et al, 1996; White et al, 2002). However, the literature is not consistent and other differences between drinkers and non-drinkers than use of alcohol may account for some of the results (Backhans & Leifman, 2001; Fillmore et al, 1998a, 1998b; Mortensen et

al, 2001). In the present study most associations of alcohol use to poorer health vanish in the multivariate logistic regression analysis, while most associations to poorer social situation remain.

In recent years, the association between alcohol consumption and mental health has received increased attention. A high co-morbidity between alcohol use disorders and psychiatric disorders has been convincingly established, while, more generally, the association between alcohol consumption and mental health is difficult to interpret (Chick, 1999; Pascall et al, 2005; Peele & Brodsky, 2000; Stranges et al, 2006). Concerning middle-aged and older populations, one study indicates fewer mental symptoms among moderate drinkers than among non-drinkers, while another study does not report this to be the case (Lang et al, 2007; Rodgers et al, 2000).

In the present population of middle-aged women, non-drinkers and weekly drinkers did not differ on any of the items regarding mental health problems; i.e. severity of mental symptoms, use of psychotropic drugs, having been treated for a mental disorder, or lifelong and previous year suicidal behaviour.

Contrary to what has been reported from other studies, in the present study binge drinkers did not differ regarding mental or physical health compared to other drinkers. Binge drinking or episodic heavy drinking is considered at-risk drinking, and has in several studies been found associated with social harm, poorer mental and physical health (Gmel et al, 2001; Graham et al, 2007; Kuntsche, 2004; Manninen et al, 2006; Rehm et al, 1996; Room et al, 2005; Stranges et al, 2006; Tolstrup et al, 2004). The lack of associations in this study between binge drinking and health problems may be due to characteristics of the study population, i.e. middle-aged women and a socially rather well-established population. In addition, the cut-off for binge drinking was set to four drinks, which is the cut-off today recommended for women, but higher levels have been used in some studies. The study was also performed during a time period when many women increased their consumption. Thus binge drinking may be a rather “new” way of drinking for some, with consequences yet to come. Finally, the context of drinking was not studied and may be of importance, e.g. whether the alcohol was consumed during a dinner party lasting several hours or without food, e.g. “after work drinking”.

In this study, drinking to relieve tension was reported by 7.2%. A similar prevalence was found in a Swedish population of women aged 20-45 (Österling, 1997). We found that women drinking to relieve tension more often reported severe mental symptoms, and less often had contact with friends, compared to other drinkers. Further, they were more often binge drinkers. These women may be at risk of developing more severe alcohol problems, since



subjects who suffer psychological distress and rely on alcohol to relieve their stress have been found to be more likely to develop alcohol abuse and dependence (NIAAA, 2000). Furthermore, higher rates of alcohol dependence and abuse have been found in women having only one or no friends for support (Thundal et al, 1999).

# GENERAL CONCLUSIONS

## *Summary of main findings*

- Three out of four middle-aged women drink alcohol weekly. Most of the women report a low level of consumption, but one out of ten drinks at a level today considered potentially hazardous for women. Despite an on average low alcohol consumption, binge drinking is common.
- Women not drinking alcohol weekly have a lower level of education and are more often granted a disability pension or are on long-term sick leave. This is more pronounced among those who never drink alcohol. Binge drinkers do not differ regarding social situation.
- Mental symptoms are common, and are strongly associated with physical symptoms.
- Of women with severe mental symptoms, 15.4% report using psychotropic drugs, and 4.1% have medical control for mental reasons.
- Immigrants were not more often troubled by severe mental symptoms than Swedish-born women.
- Women not drinking alcohol showed some indications of a poorer physical health, but no associations to mental health were found. Binge drinking was not found to be associated to signs of an impaired physical or mental health.
- Women drinking to relieve tension had poorer mental health than other drinkers, and they were more often binge drinkers.

## ***Future research***

The increase in middle-aged women's alcohol consumption stresses the importance of future research into alcohol use and health in this group. It would certainly be of interest to make a follow-up study of the present study population to investigate what characterizes those who may later have changed their consumption, e.g. regarding prior alcohol use, health and social situation, but also to investigate whether, e.g. the lack of associations found between binge drinking and adverse health is at least partly due to the cross-sectional nature of the study. Previous studies have mainly investigated binge drinking in younger populations. However, as this study showed that binge drinking is common in middle-aged women, further research is needed to explore both health and social consequences of this drinking pattern in women of this age. To further elucidate the more unfavourable social situation for abstainers and occasional drinkers studies with a longitudinal design may be needed. Studies with this design would also be appropriate to better capture the complex relationships between alcohol consumption, mental health and social adjustment.

This study also points out poor subjective health among middle-aged women. Whether or not, to any extent, the rather low frequency of psychotropic drug use and medical control for mental reason found in this study is due to underestimation, misinterpretation or negligence by health professionals of the symptoms reported by these women, thus possibly indicating a health service problem, cannot be answered by this type of study. To find ways of promoting the well-being of these women, but also from a health insurance perspective, more attention should be paid to women with severe mental symptoms. Future research, with a multidisciplinary perspective, could focus on causes of the high prevalence of symptoms, and what kind of help the women need.

## ***Clinical implications***

The study shows that most of the women report their average consumption to be low, but one out of ten drinks at a level that today is considered to be potentially hazardous, and binge drinking is found to be common. Women are more sensitive to alcohol than men (Bradley et al, 1998). Among the middle-aged many experience health problems and use medications, which may increase the risk related to alcohol consumption. Thus, in middle-aged women

seeking health-care, it is appropriate to ask about alcohol use, not least among socially well-established women.

In addition, mental symptoms were common, and were found to be strongly associated with physical symptoms. This indicates that both mental and physical health may need to be investigated in women seeking health care for various symptoms. Furthermore, the social situation in women with severe mental symptoms should be investigated and possible psychosocial problems lifted.

A minority of the women of the study affirm drinking to relieve tension. Drinking alcohol for this reason was found to be associated with poorer mental health as well as with binge drinking. Women with this motive for drinking alcohol need to be identified in health care, as they may need intervention both regarding their mental health and regarding their alcohol use.

## ***Epilogue***

This study has focused on alcohol use and mental health in a population of women born between 1935 and 1945. Several changes have occurred during their lives regarding women's living conditions and social position, and these changes have probably affected both their lifestyle and health. They can be regarded as the first generation of women with multiple roles. When they turned adult it was becoming more common for women in general to be employed, receive higher education and aim for a career of their own. The influence of multiple roles was not investigated in this study. However, the results of the study show that middle-aged women's alcohol use and mental health have several associations to their social situation.

In recent years there has been an increase in both alcohol consumption and mental health problems in the Swedish population. On the whole, the findings that one out of ten drinks at a level today considered as potentially hazardous, and that binge drinking is common, along with the high frequencies of mental symptoms point to the need of vigilance concerning middle-aged women's future psychosocial health.

## REFERENCES

- Allamani A, Voller F, Kubicka L, Bloomfield K (2000). *Drinking Cultures and the Position of Women in Nine European Countries*. Subst. Abus.; 21:231-247.
- Al-Windi A, Elmfeldt D, Tibblin G, Svärdsudd K (1999). *The influence of sociodemographic characteristics on well-being and symptoms in a Swedish community. Results from a postal questionnaire survey*. Scand. J. Prim. Health Care; 17:201-209.
- Al-Windi A, Dag E, Kurt S (2002). *The influence of perceived well-being and reported symptoms on health care utilization: a population-based study*. J. Clin. Epidemiol.; 55:60-66.
- Amore M, Di Donato P, Berti A, Palareti A, Chirico C, Papalini A, Zucchini S (2007). *Sexual and psychological symptoms in the climacteric years*. Maturitas; 56:303-311.
- Andréasson S, Allebeck P (Eds.) (2005). *Alkohol och hälsa. En kunskapsöversikt om alkoholens positiva och negativa effekter på vår hälsa. Rapport R 2005:11*. Statens Folkhälsoinstitut, Stockholm, Sweden.
- Angel JL, Buckley CJ, Sakamoto A (2001). *Duration or disadvantage? Exploring nativity, ethnicity, and health in midlife*. J. Gerontol. B. Psychol. Sci. Soc. Sci.; 56:275-284.
- Apoteksbolaget, Statistikenhet (2003). [Pharmacy, Statistics]. Apotekets försäljning av humanläkemedel på recept 2000-2002. [www.apoteket.se](http://www.apoteket.se)
- Apoteksbolaget, Statistikenhet (2007). [Pharmacy, Statistics]. Försäljningsutveckling av läkemedel för Nervsystemet 2006 [www.apoteket.se](http://www.apoteket.se)
- Backhans M, Leifman H (2001). *Vem blir nykterist? Om nykteristen som avvikare*. Sociologisk forskning; 1:58-91.
- Bardel A, Wallander MA, Svärdsudd K (2002). *Hormone replacement therapy and symptom reporting in menopausal women: a population-based study of 35-65-year-old women in mid-Sweden*. Maturitas; 41:7-15.
- Barnett RC (2004). *Women and multiple roles: myths and reality*. Harv. Rev. Psychiatry; 12:158-164. Review.
- Bayard-Burfield L (1999). *Migration and Mental Health: Epidemiological Studies of Immigrants in Sweden*. Doctoral dissertation. Department of Community Medicine, Lund University, Sweden.
- Bayard-Burfield L, Sundquist J, Johansson SE, Träskman-Bendz L (1999). *Attempted suicide among Swedish-born people and foreign-born migrants*. Arch. Suicide Res.; 5:43-55.
- Bayard-Burfield L, Sundquist J, Johansson SE (2001). *Ethnicity, self reported psychiatric illness, and intake of psychotropic drugs in five ethnic groups in Sweden*. J. Epidemiol. Community Health; 55:657-664.

- Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J (1961). *An inventory for measuring depression*. Arch. Gen. Psychiatry; 4:561-571.
- Bengtsson C, Edström K, Furunes B, Sigurdsson JA, Tibblin G (1987). *Prevalence of subjectively experienced symptoms in a population sample of women with special reference to women with arterial hypertension*. Scand. J. Prim. Health Care; 5:155-162.
- Bengtsson C, Allebeck P, Lissner L, Björkelund C, Hallström T, Sigurdsson JA (1998). *Alcohol habits in Swedish women: observations from the population study of women in Gothenburg, Sweden 1968-1993*. Alcohol Alcohol; 33:533-540.
- Berglund M, Bergman H, Swenelius T (1988). *The Swedish Alcohol Use Inventory (AVI), a self-report inventory for differentiated diagnosis in alcoholism*. Alcohol Alcohol; 23:173-178.
- Berglund M, Öjehagen A (1998). *The influence of alcohol drinking and alcohol use disorders on psychiatric disorders and suicidal behavior*. Alcohol Clin Exp Res; 22:333-345. Review.
- Berglund M, Öjehagen A. Depression och självmord (2005). In Andréasson S, Allebeck P (Eds.): Alkohol och hälsa. En kunskapsöversikt om alkoholens positiva och negativa effekter på vår hälsa. Rapport R:2005. Statens Folkhälsoinstitut, Stockholm, Sweden, pp 73-79
- Bijl RV, Ravelli A, van Zessen G (1998). *Prevalence of psychiatric disorder in the general population: results of The Netherlands Mental Health Survey and Incidence Study (NEMESIS)*. Soc. Psychiatry Psychiatr. Epidemiol.; 33:587-595.
- Bjelland I, Dahl AA, Haug TT, Neckelmann D (2002). *The validity of the Hospital Anxiety and Depression Scale. An updated literature review*. J. Psychosom .Res.; 52:69-77.
- Blennow G, Romelsjö A, Leifman H, Leifman A, Karlsson G (1994). *Sedatives and hypnotics in Stockholm: social factors and kinds of use*. Am. J. Public Health; 84:242-246.
- Blow FC, Barry KL (2002). *Use and misuse of alcohol among older women*. Alcohol Res. Health; 26:308-315. Review.
- Bourdon KH, Rae DS, Locke BZ, Narrow WE, Regier DA (1992). *Estimating the prevalence of mental disorders in U.S. adults from the Epidemiologic Catchment Area Survey*. Public Health Rep; 107:663-668.
- Brace M, McCauley E (1997). *Oestrogens and psychological well-being*. Ann. Med.; 29:283-290.
- Bradley KA, Badrinath S, Bush K, Boyd-Wickizer J, Anawalt B (1998). *Medical risks for women who drink alcohol*. J Gen Intern Med;13:627-639.
- Brown MJ, Dobson AJ, Bryson L, Byles JE (1999). *Women's Health Australia: on the progress of the main cohort studies*. J. Womens Health Gend. Based Med.; 8:681-688.
- Caetano R, Clark CL, Tam T (1998). *Alcohol consumption among racial/ethnic minorities: theory and research*. Alcohol Health Res. World; 22:233-241. Review.

CAN: Centraförbundet för alkohol- och narkotikaupplysning (2006) [The Swedish Council for Information on Alcohol and other Drugs]. Drogutvecklingen i Sverige 2006. [English summary: Drug trends in Sweden 2006]. Rapport no 98. Stockholm, Sweden.

Carlstedt G, Forssén A (1999). Mellan ansvar & makt. En diskussion om arbete, hälsa och ohälsa utifrån tjugo kvinnors livsberättelser. [Between responsibility and power. A discussion of work, health and ill health from the life-histories of twenty women]. Doctoral dissertation. Luleå University of Technology. Department of Work Science, Division of Gender and Technology, Luleå, Sweden.

Chick J (1999). *Can light or moderate drinking benefit mental health?* Eur. Addict. Res.; 5:74-81. Review.

Cotterchio M, Kreiger N, Darlington G, Steingart A (1999). *Comparison of self-reported and physician-reported antidepressant medication use.* Ann. Epidemiol.; 9:283-289.

Dawson DA, Room R (2000). *Towards agreement on ways to measure and report drinking patterns and alcohol-related problems in adult general population surveys: the Skarpo conference overview.* J. Subst. Abuse; 12:1-21. Review.

Del Boca FK, Darkes J (2003). *The validity of self-reports of alcohol consumption: state of the science and challenges for research.* Addiction; 98:1-12.

Derogatis LR, Lipman RS, Covi L (1973). *SCL-90: an outpatient psychiatric rating scale--preliminary report.* Psychopharmacol. Bull.; 9:13-28.

Drivsholm T, Eplov LF, Davidsen M, Jorgensen T, Ibsen H, Hollnagel H, Borch-Johnsen K (2006). *Representativeness in population-based studies: a detailed description of non-response in a Danish cohort study.* Scand. J. Public Health; 34:623-631.

Ekström H, Hovellius B (2000). *Quality of life and hormone therapy in women before and after menopause.* Scand. J. Prim. Health Care; 18:115-121.

Ekström H, Esseveld J, Hovellius B (2003). *Associations between attitudes toward hormone therapy and current use of it in middle-aged women.* Maturitas; 46:45-57.

Ferrada-Noli M (1997). *A cross-cultural breakdown of Swedish suicide.* Acta Psychiatr. Scand.; 96:108-116.

Feunekes GI, van't Veer P, van Staveren WA, Kok FJ (1999). *Alcohol intake assessment: the sober facts.* Am. J. Epidemiol.; 150:105-112. Review.

Fillmore KM, Golding JM, Graves KL, Knip S, Leino EV, Romelsjö A, Shoemaker C, Ager CR, Allebeck P, Ferrer HP (1998a). *Alcohol consumption and mortality. I. Characteristics of drinking groups.* Addiction; 93:183-203.

Fillmore KM, Golding JM, Graves KL, Knip S, Leino EV, Romelsjö A, Shoemaker C, Ager CR, Allebeck P, Ferrer HP (1998b). *Alcohol consumption and mortality. III. Studies of female populations.* Addiction; 93:219-229.

- Fonager K, Sabroe S (2001). *A comparative analysis of different methods for obtaining estimates of alcohol consumption in a Danish population survey*. Scand. J. Public Health; 29:256-262.
- Forsell Y (2006). *The pathway to meeting need for mental health services in Sweden*. Psychiatr. Serv.; 57:114-119.
- Forssén A, Carlstedt G (2003). Varsågod och var stark. Om kvinnors liv, arbete och hälsa under 1900 talet. Studentlitteratur, Lund, Sweden.
- Frans Ö (2003). Posttraumatic stress disorder (PTSD) in the general population. Doctoral dissertation. Department of Social Medicine. Uppsala University, Uppsala, Sweden.
- Gmel G (2000). *The effect of mode of data collection and of non-response on reported alcohol consumption: a split-sample study in Switzerland*. Addiction; 95:123-134.
- Gmel G, Klingemann S, Muller R, Brenner D (2001). *Revising the preventive paradox: the Swiss case*. Addiction; 96:273-284.
- Goldberg DP, Gater R, Sartorius N, Ustun TB, Piccinelli M, Gureje O, Rutter C (1997). *The validity of two versions of the GHQ in the WHO study of mental illness in general health care*. Psychol. Med; 27:191-197.
- Graham K, Vidal-Zeballos D (1998). *Analyses of use of tranquilizers and sleeping pills across five surveys of the same population (1985-1991): the relationship with gender, age and use of other substances*. Soc. Sci. Med.; 46:381-395.
- Graham K, Massak A, Demers A, Rehm J (2007). *Does the association between alcohol consumption and depression depend on how they are measured?* Alcohol Clin. Exp. Res.; 31:78-88.
- Grant BF (1997). *Prevalence and correlates of alcohol use and DSM-IV alcohol dependence in the United States: results of the National Longitudinal Alcohol Epidemiologic Survey*. J. Stud. Alcohol; 58:464-473.
- Grant BF, Stinson FS, Dawson DA, Chou SP, Dufour MC, Compton W, Pickering RP, Kaplan K (2004). *Prevalence and co-occurrence of substance use disorders and independent mood and anxiety disorders: results from the National Epidemiologic Survey on Alcohol and Related Conditions*. Arch. Gen. Psychiatry; 61:807-816.
- Gronbaek M, Deis A, Sorensen TI, Becker U, Schnohr P, Jensen G (1995). *Mortality associated with moderate intakes of wine, beer, or spirits*. BMJ; 310:1165-1169.
- Harris MI, Hadden WC, Knowler WC, Bennett PH (1987). *Prevalence of diabetes and impaired glucose tolerance and plasma glucose levels in U.S. population aged 20-74 yr*. Diabetes; 36:523-534.
- Hartmann S, Aradottir S, Graf M, Wiesbeck G, Lesch O, Ramskogler K, Wolfersdorf M, Alling C, Wurst FM (2007). *Phosphatidylethanol as a sensitive and specific biomarker:*



*comparison with gamma-glutamyl transpeptidase, mean corpuscular volume and carbohydrate-deficient transferrin. Addict. Biol.*; 12:81-84.

Haynes JC, Farrell M, Singleton N, Meltzer H, Araya R, Lewis G, Wiles NJ (2005). *Alcohol consumption as a risk factor for anxiety and depression: results from the longitudinal follow-up of the National Psychiatric Morbidity Survey. Br. J. Psychiatry*; 187:544-551.

Heeb JL, Gmel G (2005). *Measuring alcohol consumption: a comparison of graduated frequency, quantity frequency, and weekly recall diary methods in a general population survey. Addict. Behav.*; 30:403-413.

Hjern A (2001). *High use of sedatives and hypnotics in ethnic minorities in Sweden. Ethn. Health*; 6:5-11.

Hjern A, Allebeck P (2004). *Alcohol-related disorders in first- and second-generation immigrants in Sweden: a national cohort study. Addiction*; 99:229-236.

Horwath E, Johnson J, Klerman GL, Weissman MM (1994). *What are the public health implications of subclinical depressive symptoms? Psychiatr. Q.*; 65:323-337.

Hunter MS (1992). *The Women's Health Questionnaire: a measure of mid-aged women's perceptions of their emotional and physical health. Psychol. & Health*; 7:45-54.

ICAP: International Center for Alcohol Policies (2003). International drinking guidelines. ICAP Reports 14. [www.icap.org](http://www.icap.org)

Iglesias E, Robertson E, Johansson SE, Engfeldt P, Sundquist J (2003). *Women, international migration and self-reported health. A population-based study of women of reproductive age. Soc. Sci. Med.*; 56:111-124.

Johansson LM, Sundquist J, Johansson SE, Bergman B, Qvist J, Träskman-Bendz L (1997). *Suicide among foreign-born minorities and Native Swedes: an epidemiological follow-up study of a defined population. Soc. Sci. Med.*; 44:181-187.

Johnson TP, VanGeest JB, Cho YI (2002). *Migration and substance use: evidence from the U.S. National Health Interview Survey. Subst. Use Misuse*; 37:941-972.

Karlsson, K (2004). Psychosocial illness. Community, primary health care and individual perspectives. Doctoral dissertation. Department of Psychology, Division of Personality and Social Psychology. Lund University, Lund, Sweden.

Korten A, Henderson S (2000). *The Australian National Survey of Mental Health and Well-Being. Common psychological symptoms and disablement. Br. J. Psychiatry*; 177:325-330.

Krantz G (2000). Living conditions and women's health. Doctoral dissertation. Department of Social Medicine, Sahlgrenska Academy, Gothenburg, Sweden.

Krantz G, Östergren PO (2002). *Do common symptoms in women predict long spells of sickness absence? A prospective community-based study on Swedish women 40 to 50 years of age. Scand. J. Public Health*; 30:176-183.

- Kuhlhorn E, Leifman H (1993). *Alcohol surveys with high and low coverage rate: a comparative analysis of survey strategies in the alcohol field*. J. Stud. Alcohol; 54:542-554.
- Kuntsche E, Rehm J, Gmel G (2004). *Characteristics of binge drinkers in Europe*. Soc. Sci. Med.; 59:113-127. Review.
- Lahaut V, Jansen H, van de Mheen D, Garretsen H (2003). *Comparison of two formats of the weekly recall and quantity-frequency alcohol measures*. Journal of Substance Use; 8:164-169.
- Lang I, Wallace RB, Huppert FA, Melzer D (2007). *Moderate alcohol consumption in older adults is associated with better cognition and well-being than abstinence*. Age Ageing; 36:256-261.
- Leifman H (2001). *Homogenisation in alcohol consumption in the European Union*. Nordic Studies on Alcohol and Drugs; 18:15-30.
- Leifman H (2003). *Vilka dricker mer alkohol i Sverige?* Nordisk Alkohol- & Narkotikatidskrift; 20:159-180.
- Leifman H (2005). *Alkoholen i Sverige – konsumtion och dryckesmönster*. In: Andréasson S, Allebeck P (Eds.): *Alkohol och hälsa. En kunskapsöversikt om alkoholens positiva och negativa effekter på vår hälsa*. Rapport R 2005:11. Statens Folkhälsoinstitut, Stockholm, Sweden, pp 15-35.
- Li C, Wilawan K, Samsioe G, Lidfeldt J, Agardh CD, Nerbrand C (2002). *Health profile of middle-aged women: The Women's Health in the Lund Area (WHILA) study*. Hum. Reprod.; 17: 1379-1385.
- Lidfeldt J, Nyberg P, Nerbrand C, Öjehagen A, Samsioe G, Schersten B, Agardh CD (2002). *Biological factors are more important than socio-demographic and psychosocial conditions in relation to hypertension in middle-aged women. The Women's Health in the Lund Area (WHILA) study*. Blood Press; 11:270-278.
- Lidfeldt J, Nyberg P, Nerbrand C, Samsioe G, Schersten B, Agardh CD (2003). *Socio-demographic and psychosocial factors are associated with features of the metabolic syndrome. The Women's Health in the Lund Area (WHILA) study*. Diabetes Obes. Metab.; 5:106-112.
- Maclean H, Glynn K, Ansara D (2004). *Multiple Roles and Women's Mental Health in Canada*. BMC Womens Health; 4 Suppl 1:S3.
- Manninen L, Poikolainen K, Vartiainen E, Laatikainen T (2006). *Heavy drinking occasions and depression*. Alcohol Alcohol; 41:293-299.
- Marklund H (2007). *Finländarna fortfarande flest*. Välfärd; 1:1-4. SCB: Statistiska Centralbyrån [Statistics Sweden]. [www.scb.se](http://www.scb.se)
- Mayfield D, McLeod G, Hall P (1974). *The CAGE questionnaire: validation of a new alcoholism screening instrument*. Am. J. Psychiatry; 131:1121-1123.

Migrationsverket [the Swedish Migration Board]. History of the Swedish migration (available in English). [www.migrationsverket.se](http://www.migrationsverket.se)

Mortensen EL, Jensen HH, Sanders SA, Reinisch JM (2001). *Better psychological functioning and higher social status may largely explain the apparent health benefits of wine: a study of wine and beer drinkers in young Danish adults*. Arch. Intern. Med.; 161:1844–1848.

Månsson NO, Råstam L, Eriksson KF, Israelsson B (1999). *Alcohol consumption and disability pension among middle-aged men*. Ann Epidemiol; 9:341–348.

NASP: Nationellt och Stockholms läns landstings centrum för suicidforskning och prevention av psykisk ohälsa [National Centre for Suicide Research and Prevention of Mental Ill-Health]. [www.ki.se/suicide/statistik.html](http://www.ki.se/suicide/statistik.html)

Nazeri K, Khatibi A, Nyberg P, Agardh CD, Lidfeldt J, Samsioe G (2006). *Colorectal cancer in middle-aged women in relation to hormonal status: a report from the Women's Health in the Lund Area (WHILA) study*. Gynecol. Endocrinol.; 22:416–422.

Neve RJ, Drop MJ, Lemmens PH, Swinkels H (1996). *Gender differences in drinking behaviour in the Netherlands: convergence or stability?* Addiction; 91:357–373.

NIAAA: National Institute on Alcohol Abuse and Alcoholism (2000). Measuring the health risks and benefits of alcohol. Alcohol Research & Health; 24:3–27.

Nilsson E, Bogren M, Mattisson C, Nettelbladt P (2007). *Point prevalence of neurosis in the Lundby Study 1947–1997*. Nord. J. Psychiatry; 61:33–39.

Norusis MJ (1995). SPSS 6.1 guide to data analysis. Englewood Cliffs, N.J: Prentice Hall.

Ohayon MM, Priest RG, Guilleminault C, Caulet M (1999). *The prevalence of depressive disorders in the United Kingdom*. Biol Psychiatry; 1;45:300–307.

Ormel J, Koeter MW, van den Brink W, van de Willige G (1991). *Recognition, management, and course of anxiety and depression in general practice*. Arch Gen Psychiatry; 48:700–706.

Paschall MJ, Freisthler B, Lipton RI (2005). *Moderate alcohol use and depression in young adults: findings from a national longitudinal study*. Am. J. Public Health; 95:453–457.

Peele S, Brodsky A (2000). *Exploring psychological benefits associated with moderate alcohol use: a necessary corrective to assessments of drinking outcomes?* Drug Alcohol Depend.; 60:221–247. Review.

Pietraru C, Barbui C, Poggio L, Tognoni G (2001). *Antidepressant drug prescribing in Italy, 2000: analysis of a general practice database*. Eur. J. Clin. Pharmacol.; 57: 605–609.

Poikolainen K (1995). *Alcohol and mortality: a review*. J. Clin. Epidemiol.; 48:455–465. Review.

Poikolainen K, Vartianinen E, Korhonen HJ (1996). *Alcohol intake and subjective health*. Am. J. Epidemiol; 144:346-350.

Rehm J, Ashley MJ, Room R, Single E, Bondy S, Ferrence R, Giesbrecht N (1996). *On the emerging paradigm of drinking patterns and their social and health consequences*. Addiction; 91:1615-1621.

Renberg ES (2001). *Self-reported life-weariness, death-wishes, suicidal ideation, suicidal plans and suicide attempts in general population surveys in the north of Sweden 1986 and 1996*. Soc. Psychiatry Psychiatr. Epidemiol.; 36:429-436.

RFV: Riksförsäkringsverket (2000) [The National Social Insurance Board]. Långtidssjukskrivna – bakgrund, diagnos och återgång i arbete. RFV Redovisar 2000:11. Stockholm, Sweden.

Richter P, Werner J, Heerlein A, Kraus A, Sauer H (1998). *On the validity of the Beck Depression Inventory. A review*. Psychopathology; 31:160-168. Review.

Rimm EB, Klatsky A, Grobbee D, Stampfer MJ (1996). *Review of moderate alcohol consumption and reduced risk of coronary heart disease: is the effect due to beer, wine, or spirits*. BMJ; 312:731-736. Review.

Robins LN, Helzer JE, Croughan JL, Ratcliff KS (1981). *National Institute of Mental Health Diagnostic Interview Schedule: Its history, characteristics and validity*. Arch. Gen. Psychiatry; 38:381-389.

Robins LN, Wing J, Wittchen J-U, Helzer JE, Babor TF, Burke JD, et al (1988). *The Composite International Diagnostic Interview: An epidemiologic instrument suitable for use in conjunction with different diagnostic systems and in different cultures*. Arch. Gen. Psychiatry; 45:1069-1077.

Rodgers B, Korten AE, Jorm AF, Jacomb PA, Christensen H, Henderson AS (2000). *Non-linear relationships in associations of depression and anxiety with alcohol use*. Psychol. Med.; 30:421-432.

Romelsjö A (1989). *The relationship between alcohol consumption and social status in Stockholm. Has the social pattern of alcohol consumption changed?* Int. J. Epidemiol.; 18:842-851.

Room R, Babor T, Rehm J (2005). *Alcohol and public health*. Lancet; 365:519-530. Review.

Rosengren A, Wilhelmsen L, Berglund G, Elmfeldt D (1987). *Non-participants in a general population study of men, with special reference to social and alcoholic problems*. Acta Med. Scand.; 221:243-251.

Saunders JB, Aasland OG, Babor TF, de la Fuente JR, Grant M (1993). *Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption--II*. Addiction; 88:791-804.

SBU: Statens beredning för medicinsk utvärdering (2003) [The Swedish Council on Technology Assessment in Health Care]. Rapport: Sjukskrivning – orsaker, konsekvenser och praxis. En systematisk litteraturöversikt, 1 volym. SBU: Stockholm, Sweden.

SBU: Statens beredning för medicinsk utvärdering (2004) [The Swedish Council on Technology Assessment in Health Care]. Rapport: Behandling av depressions sjukdomar, 3 volymer. SBU: Stockholm, Sweden.

SBU: Statens beredning för medicinsk utvärdering (2005) [The Swedish Council on Technology Assessment in Health Care]. Rapport: Behandling av ångestsyndrom. En systematisk litteraturöversikt, 2 volymer. SBU: Stockholm, Sweden.

SCB: Statistiska Centralbyrån (2006) [Statistics Sweden]. På tal om kvinnor och män 2006. SCB Tryck, Örebro, Sweden.

Selin, K H (2004). Dryckesvanor i den svenska befolkningen. In: Selin KH (Ed.): Svenska dryckesvanor och deras konsekvenser i början av det nya millenniet. SoRAD, Stockholms universitet. Forskningsrapport nr 20. Stockholm, Sweden, pp 75-94.

Selzer ML (1971). *The Michigan alcoholism screening test: the quest for a new diagnostic instrument*. Am. J. Psychiatry; 127:1653-1658.

Shakir YA, Samsioe G, Khatibi E A, Nyberg P, Lidfeldt J, Agardh CD, Nerbrand C (2007). *Health hazards in middle-aged women with cardiovascular disease: a case-control study of Swedish women. The women's health in the Lund area (WHILA) study*. J. Womens Health; 16:406-414.

Simpura J, Karlsson T (2001). *Trends in drinking patterns among adult population in 15 European countries, 1950 to 2000: a review*. Nordic Studies on Alcohol and Drugs; 18:31-53.

SoU: Statens offentliga utredningar (1994) [Swedish Government Official Reports]. Kvinnor och alkohol. Delbetänkande av alkoholpolitiska kommissionen. SoU 1994:28. Stockholm, Sweden.

Spak F, Hällström T (1995). *Prevalence of female alcohol dependence and abuse in Sweden*. Addiction; 90:1077-1088.

Spak F, Hällström T (1996). *Screening for alcohol dependence and abuse in women: description, validation, and psychometric properties of a new screening instrument, SWAG, in a population study*. Alcohol Clin. Exp. Res.; 20:723-731.

Spak L, Spak F, Allebeck P (2000). *Alcoholism and depression in a Swedish female population: co-morbidity and risk factors*. Acta Psychiatr. Scand.; 102:44-51.

Stefansson CG (2006). *Major public health problems - mental ill-health*. Scand. J. Public Health; Suppl, 67:87-103.

Stockwell T, Donath S, Cooper-Stanbury M, Chikritzhs T, Catalano P, Mateo C (2004). *Under-reporting of alcohol consumption in household surveys: a comparison of quantity-frequency, graduated-frequency and recent recall*. Addiction; 99:1024-1033.

- Stranges S, Notaro J, Freudenheim JL, Calogero RM, Muti P, Farinaro E, Russell M, Nochajski TH, Trevisan M (2006). *Alcohol drinking pattern and subjective health in a population-based study*. *Addiction*; 101:1265-1276.
- Sundquist J (1994). *Refugees, labour migrants and psychological distress. A population-based study of 338 Latin-American refugees, 161 south European and 396 Finnish labour migrants, and 996 Swedish age-, sex- and education-matched controls*. *Soc. Psychiatry Psychiatr. Epidemiol.*; 29:20-24.
- Teleman PM, Lidfeldt J, Nerbrand C, Samsioe G, Mattiasson A (2004). *WHILA study group Overactive bladder: prevalence, risk factors and relation to stress incontinence in middle-aged women*. *BJOG*; 111:600-604.
- Theobald H, Bygren LO, Carstensen J, Engfeldt P (2000). *A moderate intake of wine is associated with reduced total mortality and reduced mortality from cardiovascular disease*. *J. Stud. Alcohol*; 61:652-656.
- Theobald H, Johansson SE, Engfeldt P (2003). *Influence of different types of alcoholic beverages on self-reported health status*. *Alcohol Alcohol*; 38:583-588.
- Thundal KL, Granbom S, Allebeck P (1999). *Women's alcohol dependence and abuse: the relation to social network and leisure time*. *Scand. J. Public Health*; 27:30-37.
- Thundal KL, Spak F, Allebeck P (2000). *Drinking patterns among Swedish women: results from a 5-year follow-up of a population-based study*. *Alcohol Alcohol*; 35:520-524.
- Tibblin G, Bengtsson C, Furunes B, Lapidus L (1990a). *Symptoms by age and sex. The population studies of men and women in Gothenburg, Sweden*. *Scand. J. Prim. Health Care*; 8:9-17.
- Tibblin G, Tibblin B, Peciva S, Kullman S, Svärdsudd K (1990b). *"The Göteborg quality of life instrument"--an assessment of well-being and symptoms among men born 1913 and 1923. Methods and validity*. *Scand. J. Prim. Health Care*; 1:33-38.
- Tolstrup JS, Jensen MK, Tjønneland A, Overvad K, Gronbaek M (2004). *Drinking pattern and mortality in middle-aged men and women*. *Addiction*; 99:323-330.
- Upmark M, Möller J, Romelsjö A (1999). *Longitudinal, population-based study of self reported alcohol habits, high levels of sickness absence, and disability pensions*. *J. Epidemiol. Community Health*; 53:223-229.
- van den Brandt PA, Petri H, Dorant E, Goldbohm RA, Van de Crommert S (1991). *Comparison of questionnaire information and pharmacy data on drug use*. *Pharm. Weekbl. Sci*; 13:91-96.
- Wanberg KW, Horn JL, Foster FM (1977). *A differential assessment model for alcoholism. The scales of the Alcohol Use Inventory*. *J. Stud. Alcohol*; 38:512-543.

- Wechsler H, Dowdall GW, Davenport A, Rimm EB (1995). *A gender-specific measure of binge drinking among college students*. Am. J. Public Health; 85:982-985.
- Westman J, Hasselström J, Johansson SE, Sundquist J (2003). *The influences of place of birth and socioeconomic factors on attempted suicide in a defined population of 4.5 million people*. Arch. Gen. Psychiatry; 60:409-414.
- White IR, Altmann DR, Nanchahal K (2002). *Alcohol consumption and mortality: modelling risks for men and women at different ages*. BMJ; 325:191-197.
- Wiklund I, Karlberg J, Lindgren R, Sandin K, Mattsson LA (1993). *A Swedish version of the Women's Health Questionnaire. A measure of postmenopausal complaints*. Acta Obstet. Gynecol. Scand.; 72:648-655.
- Wilhelm K, Mitchell P, Slade T, Brownhill S, Andrews G (2003). *Prevalence and correlates of DSM-IV major depression in an Australian national survey*. J. Affect. Disord.; 75:155-162.
- Wilsnack SC, Wilsnack RW (1995). *Drinking and problem drinking in US women. Patterns and recent trends*. Recent Dev. Alcohol; 12:29-60.
- Österling A, Berglund M (1996). *Alcohol consumption and regular benzodiazepine use in 55-year-old female Malmö residents: results of a health screening*. Acta Psychiatr. Scand.; 94:141-148.
- Österling, A (1997). *Alcohol problems in women: gender characteristics relevant for identification in clinical and health screenings settings*. Doctoral dissertation. Department of Clinical Alcohol Research, Lund University, Malmö, Sweden.

# POPULÄRVETENSKAPLIG SAMMANFATTNING

(Summary in Swedish)

Omfattningen av såväl alkoholkonsumtion som psykiska besvär hos befolkningen är av stor betydelse för folkhälsan och samhällsekonomin. Under 1990-talet har det skett förändringar av svenskarnas alkoholkonsumtion och psykiska hälsa. Alkoholkonsumtionen har ökat kraftigt. Ökningstakten har varit större bland kvinnor än bland män och särskilt bland kvinnor i åldrarna 50 och över. Det har också skett en ökning av den psykiska ohälsan och vad gäller andelen sjukskrivna för psykiska besvär.

Syftet med denna avhandling var att studera medelålders kvinnors alkoholkonsumtion, psykiska hälsa och användning av psykofarmaka, satt i relation till deras sociala situation och hälsa. En särskild analys har gjorts av de kvinnor som invandrat till Sverige.

Avhandlingen baseras på material från en hälsoundersökning kallad WHILA-studien som genomfördes under 1995-2000. Alla kvinnor i åldern 50-59 år, födda mellan 1935 och 1945, och som var boende i Lund med kranskommuner, inbjöds till WHILA-studien. Av dessa 10 766 kvinnor valde 6 917 (64%) att delta.

Avhandlingen består av 4 delstudier. Dessa baseras på ett omfattande frågeformulär som kvinnorna besvarade i samband med hälsoundersökningen.

I den första studien undersöktes kvinnornas veckokonsumtion av alkohol. Det framkom att 3 av 4 kvinnor dricker alkohol under en såkallad "vanlig vecka". För majoriteten rör det sig om en låg konsumtion och vin är den klart dominerande alkoholsorten framför öl och sprit.

Kvinnorna kategoriserades som icke-konsumenter (dvs de som inte drack alkohol under en "vanlig vecka"), lågkonsumenter, måttlighetskonsumenter och högkonsumenter. Jämförelser gjordes mellan dessa grupper vad gäller social situation och hälsa.

Få skillnader framkom mellan låg-, medel-, och högkonsumenter. Däremot framkom ett flertal skillnader mellan icke-konsumenterna och alkoholkonsumenterna. Icke-konsumenterna hade flera indikationer på sämre social situation och sämre fysisk hälsa. De var oftare ensamstående, hade lägre utbildningsnivå, var oftare förtidspensionärer eller långtidssjukskrivna och de hade oftare regelbunden sjukdomskontroll. Däremot framkom inga skillnader vad gäller den psykiska hälsan.



I det andra arbetet undersöktes kvinnornas förekomst av psykiska symtom samt regelbundna bruk av psykofarmaka. Psykiska symtom var mycket vanliga. Besvär av symtom som allmän trötthet, nedstämdhet, svårigheter att koppla av, sömnproblem, irritation och utmattning rapporterades av mer än 40% av kvinnorna.

Den fjärdedel som angett flest symtom jämfördes med den fjärdedel som angett minst symtom. Det framkom inga skillnader vad gäller alkoholkonsumtion. Däremot framgick tydligt att de kvinnor som hade många psykiska symtom också ofta besvärades av många fysiska symtom. Vidare var de oftare ensamstående eller hade hemmavarande barn, var långtidssjukskrivna, högt utbildade samt hade mindre kontakt med vänner än kvinnorna med minst symtom.

I genomsnitt använde 7% av hela populationen regelbundet någon form av psykofarmaka. Bland kvinnorna med många psykiska symtom var det 15% som regelbundet använde psykofarmaka och 4% som hade regelbunden sjukdomskontroll för psykiska besvär.

I det tredje arbetet analyserades alkoholkonsumtion, förekomst av psykiska symtom, respektive bruk av psykofarmaka hos de kvinnor som immigrerat till Sverige utifrån födelseland och ålder vid immigration. Födelseland indelades i följande kategorier – Sverige, Finland, övriga Norden, Östeuropa, Västeuropa samt övriga världen. För alla invandrargrupper utom dem från ”övriga Norden” fanns indikationer på en sämre social situation och fysisk hälsa än för de svenskfödda, däremot var utbildningsnivån högre för vissa invandrargrupper.

Efter hänsyn taget till social situation och hälsa kvarstod att kvinnor födda i Östeuropa och övriga världen oftare var icke-konsumenter av alkohol än de svenskfödda. Det fanns inget samband mellan psykiska symtom och födelseland. De kvinnor som invandrat från ”övriga Norden” använde oftare sömnmedel än de svenskfödda, men i praktiken rörde sig detta om ett litet antal kvinnor.

Analysen av ålder vid immigration visade att de som invandrat från Europa i unga år oftare hade få psykiska symtom men också oftare en hög alkoholkonsumtion. De som invandrat senare i livet var oftare icke-konsumenter av alkohol.

Det fjärde arbetet baserades på 513 kvinnor som besvarat ytterligare frågor om alkoholvanor, psykiatrisk sjukvård och suicidalt beteende.

I detta arbete blev det möjligt att differentiera dem som är nykterister från dem som dricker alkohol men inte under en ”vanlig” vecka. Både nykteristerna och de som drack sporadiskt

hade lägre utbildningsnivå och oftare sjukdomskontroll än veckokonsumenterna, och nykteristerna var därtill oftare förtidspensionärer. Inga associationer till psykiska symtom eller suicidalt beteende kunde konstateras.

Det framkom också att intensivdrickande (även kallat berusningsdrickande, här definierat som att dricka 4 glas vin eller motsvarande per dag) var mycket vanligt. Mer än hälften av kvinnorna hade druckit på det sättet någon gång under det senaste året och 40% under den senaste månaden. Kvinnor med detta dryckesmönster skiljde sig inte från övriga vare sig vad gällde social situation, psykisk eller fysisk hälsa.

Ett fåtal kvinnor svarade jakande på någon av de frågor som ställts för att identifiera ett eventuellt problemdrickande. Vanligast var att kvinnorna drack för att känna sig mindre spända, vilket 7% gjorde. De kvinnor som drack av denna anledning hade i större utsträckning besvär av många psykiska symtom och de hade mindre kontakt med vänner, än kvinnorna som inte angav detta. De angav också oftare intensivkonsumtion av alkohol.

Det finns få studier om medelålders kvinnors alkoholvanor. Denna studie visar att även om flertalet uppger en låg alkoholkonsumtion, så dricker en av tio på en nivå som idag anses riskfylld för kvinnor och intensivkonsumtion är vanligt förekommande.

Vidare kunde påvisas att den subjektiva ohälsan är hög bland medelålders kvinnor. Besvär av psykiska symtom har ett starkt samband med fysiska symtom och också med social situation. Det medicinska vårdbehovet hos kvinnor med många psykiska symtom behöver undersökas vidare och även deras eventuella behov av psykosociala insatser.

Relativt få kvinnor dricker för att känna sig mindre spända, men dessa kvinnor behöver identifieras i vården eftersom de kan vara i behov av insatser både vad gäller sin psykiska hälsa och sina alkoholvanor.

## ACKNOWLEDGEMENTS

I am forever grateful to Professor Agneta Öjehagen, for introducing me to the world of research, and for excellent guidance in this world. Thanks for your support and encouragement with the work of this thesis, and for your warmth as a person.

A huge thank you to Professor Anders Romelsjö, SoRAD, Stockholm University, my co-supervisor, for your excellent advice and constructive criticism and support!

I am also grateful to Professor Lil Träskman Bendtz, head of the division. Thank you for providing access to the facilities of the Department of Psychiatry, and thanks to all my colleagues in that department. I would like to express special thanks to Ulla Persson for helping me with everything from literature searching and references to linguistic matters, to Anders Niméus for your knowledge and advice about mental symptoms and psychotropic drug use, and to Göran Nordström for most valuable comments on the manuscript.

Another huge thank you to Mats Berglund for your advice on the papers and for generously providing me with a room at the Department of Clinical Alcohol Research. Thanks to all my colleagues in that department for creating an inspiring environment to work in. A special thanks to Agneta Österling for sharing your great knowledge on the topic of women and alcohol, Eva Skagert for your practical support with the thesis, and Helena Hansson for joining me on this sometimes rough road toward finishing a thesis - without your support and friendship it would have been much harder to do.

I am also most grateful to Per Nyberg for advice on statistics, and for providing this advice in understandable terms and with great patience.

My co-authors Jonas Lidfeldt, Göran Samsioe and Christina Nerbrandt for your valuable comments on the papers.

Finally, I would like to thank my family and friends who have supported me in so many ways. Thank you, dearest ones: my husband Sten and our daughter Rebecca. Sten for your love, support and patience during the last months, I am so looking forward to be able to spend time with you again! Rebecca with your total lack of interest in my work but full passion for exploring life and the world you make every day fun, challenging and beautiful!

Paper I was published in *European Addiction Research* and is printed here with permission from S Karger AG, Basel.

Paper II was published in *Scandinavian Journal of Public Health* and is printed here with permission from Informa Health Care. The Journal's web site: <http://www.informaworld.com>

Paper III is a preprint of an article whose final and definitive form has been published in the *Nordic Journal of Psychiatry* ©2006 Taylor & Francis; Nordic Journal of Psychiatry is available online at <http://www.informaworld.com/nordicjpsychiatry.com>

This study was supported by the Ax:son Johnsons Foundation and the Foundation of Söderström-Königska sjukhemmet, the Swedish Council for Working life and Social research (2001-2861) and the Swedish Research Council (521-2003-5853 and 521-2006-4515).