

How Do Register-Based Studies Contribute to Our Understanding of Alcohol's Harms to Family Members? A Scoping Review of Relevant Literature

JULIE BRUMMER, M.P.H.,^{a,*} MORTEN HESSE, PH.D.,^a KIRSTEN SØNDERGAARD FREDERIKSEN, M.A.,^a
KATHERINE J. KARRIKER-JAFFE, PH.D.,^{b,c,†} & KIM BLOOMFIELD, DR.P.H.,^{a,b,‡}

^aCentre for Alcohol and Drug Research, Aarhus University, Denmark

^bAlcohol Research Group, Public Health Institute, Emeryville, California

^cRTI International, Berkeley, California

ABSTRACT. Objective: This review maps the research literature on register-based studies of alcohol's harms to family members and identifies areas for future research. **Method:** Using a scoping review methodology, the PubMed/MEDLINE, EMBASE, and PsycINFO databases were searched in August 2019 with keywords to identify studies that included register-based outcome sources, a family relationship, and an exposure to heavy drinking. In total, 5,961 records were screened, 403 full-text articles were assessed for eligibility, and 91 studies were included in the final review. **Results:** Register-based research on alcohol's harms to family members has largely drawn on hospital records to identify heavy drinkers and has primarily focused on children of heavy drinkers; 79 of the included studies solely investigated harms to children, whereas 2 focused on partners and 10 on multiple first-degree or unspecified relatives. Register-based studies show that children of heavy

drinkers are at a higher risk for mental disorders, disease and injury hospitalizations, infant and child mortality, criminality, poor employment and educational outcomes, abuse/neglect, and placement in residential/foster care, among other negative outcomes. **Conclusions:** A substantial body of register-based research shows that children of parents with the most severe alcohol problems are at an increased risk for numerous adverse experiences. Register-based studies have investigated diverse, yet precisely defined outcomes, using large samples followed over long periods, and have examined the contribution of genetic, biological, and environmental factors. Our understanding of alcohol's harms to families could be enhanced by further register-based research on other household family members of heavy drinkers. (*J. Stud. Alcohol Drugs*, 82, 445–456, 2021)

IN WHAT WAYS does alcohol cause harm to others than those who drink themselves? Within the last 10 years, there has been an expansion of research on consequences that extend beyond the drinker, with alcohol's harm to others regarded as an umbrella term for a range of long- and short-term effects, of varying degrees of severity, inflicted by both known persons and strangers, and at both the individual and societal levels (Laslett et al., 2019). Although some studies show that harm because of strangers' drinking may be more prevalent (Laslett et al., 2011), harms caused by close relations, such as household family members and friends, may be more severe (Laslett et al., 2011) and distressing (Karriker-Jaffe et al., 2017).

Survey data have been an important source of information about the magnitude of alcohol's harms to others (Rossow, 2015) and can measure outcomes not easily assessed by other means, such as fear of harm (e.g., feeling unsafe because of others' drinking). However, surveys often rely on self-reports of alcohol-related harms, which may be influenced by individual, cultural, or temporal factors (Room et al., 2016; Rossow, 2015). It could be problematic, then, if

our understanding of alcohol's harms to others were based solely on surveys that ask participants to judge whether an undesirable event for oneself or others was attributable to alcohol. There is a need for some reflection on approaches to measure alcohol's harms to others and the sources of data used to describe and quantify these harms.

Some of the limitations of population surveys could be addressed by complementing such research with register-based data (Lund & Bukten, 2015; Rossow, 2015). Until now, however, the contribution of register-based studies has not been adequately reviewed. Register-based studies analyze existing population registers consisting of individual-level data, which have been systematically collected and regularly updated on a complete target population (United Nations Economic Commission for Europe, 2007). Like surveys, register-based research has the advantage of large study populations, and registers' wide population coverage minimizes biases attributable to selection and attrition (Thygesen & Ersbøll, 2014). Furthermore, these data are often available over extended periods, thereby allowing assessment of long-term consequences. Thus, registers are apt for capturing a range of potential harms, including rare but severe outcomes in such areas as mental health and violence (Rossow, 2015).

Register-based studies can establish associations between alcohol and harm in numerous ways. This link may be made directly, such as when alcohol's role in an event is recorded in the same register entry as the assessed outcome. For in-

Received: June 30, 2020. Revision: January 29, 2021.

*Correspondence may be sent to Julie Brummer at the Centre for Alcohol and Drug Research, Emdrup Campus, Aarhus BSS, Aarhus University, Tuborgvej 164, Building A, 2nd Floor, 2400 Copenhagen NV, Denmark, or via email at: jeb.crf@psy.au.dk. †ORCID 0000-0002-2019-0222. ‡0000-0002-9740-126X.

stance, registers of child abuse or protection measures may also record parental heavy drinking. The link may also be made through statistical analyses showing an increased risk of harm (Rossow, 2015). Since register studies can identify relatives and link records via a personal identification number, they are a fruitful source of information for alcohol's harms to family members. Previous reviews have investigated outcomes for the family as a whole (Hutchinson et al., 2014) and for children specifically (Rossow et al., 2016; Staton-Tindall et al., 2013), but we are unaware of reviews that have explored the contribution of register-based research.

The aim of this current review is to map the literature on register-based studies of alcohol's harms to family members. Accordingly, the review addresses the following research questions:

1. Which family members, in terms of relationship to the drinker, are the focus of the studies?
2. How has the exposure been operationalized?
3. What harms/outcomes for family members of heavy drinkers have been investigated?
4. What are the main findings of register-based studies, and how do the findings differ from those of survey-based studies, if at all?
5. What are the gaps in existing register-based research on alcohol's harms to family members?

Method

Study design

We used the scoping review methodology, which, although similar to that of a systematic review, is guided by the unique objective of charting the available literature on a research topic (Pham et al., 2014). The process of identifying and presenting the literature is distinguished by broader coverage and handling of the subject (Pham et al., 2014). Scoping reviews have as their main objectives to broadly describe all available research on a broad topic and identify understudied aspects (Arksey & O'Malley, 2005). This contrasts with systematic reviews, which are more narrowly focused and often aim to summarize results of comparable studies on a highly specific topic (Munn et al., 2018). The scoping review methodology was appropriate for the current review, as it is best suited to providing an overview of the literature and identifying areas where research is lacking. This review was carried out in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) checklist (Tricco et al., 2018).

Information sources and search strategy

The review of records was carried out in August 2019, in which studies were identified by searching three elec-

tronic research literature databases (PubMed/MEDLINE, EMBASE, and PsycINFO), using subject headings and terms related to relationship to the drinker, exposure, and data source (Supplemental Box 1). A final source was the reference lists of all included records. Scoping reviews may include nontraditional information sources, also known as grey literature (Tricco et al., 2018). This review, however, included only peer-reviewed studies; this served to maintain consistency with other reviews on this topic and operated as a rough quality check of included studies.

Eligibility criteria

The following criteria were used:

1. Studies must have investigated alcohol use as an exposure. No constraints were placed on the exposure data source. Studies that combined alcohol and illicit drug use into a category of "substance use" were included. There were several reasons for this decision. First, alcohol is more prevalent than any illicit drug and associated with a larger burden of illness globally (Peacock et al., 2018). This means that when a nonspecific substance use disorder is coded in a register, it is more likely to be an alcohol use disorder than any other substance. Second, people with severe alcohol problems may often have concurrent use of illicit drugs, making the distinction difficult to make, even if an attempt has been made in the original study (Staines et al., 2001).
2. The outcome variable must have been focused on harm to a family member of the drinker. Any familial relationship, immediate or extended, was accepted; however, the search terms reflect that household relations are prioritized given their intense and prolonged exposure.
3. The outcome must have been reported using a centralized register as the data source.
4. Only individual studies were included.
5. Studies published in English were included, with no restrictions on date of publication.
6. Studies that only assessed prenatal exposure or perinatal outcomes were excluded, as were studies with only substance-related outcomes.

The database searches identified 5,134 records, and a review of the included records' reference lists identified an additional 2,737 records. Duplicates from the database searches and reference lists were removed using EndNote X8.2, leaving a total of 5,961 unique records. The titles and abstracts of all unique records were screened by the first author, and based on this initial review, 403 of the records were selected for a review of the full text. Of these, 91 studies were assessed as meeting the inclusion criteria for the scoping review. Figure 1 presents the PRISMA flowchart of the selection process.

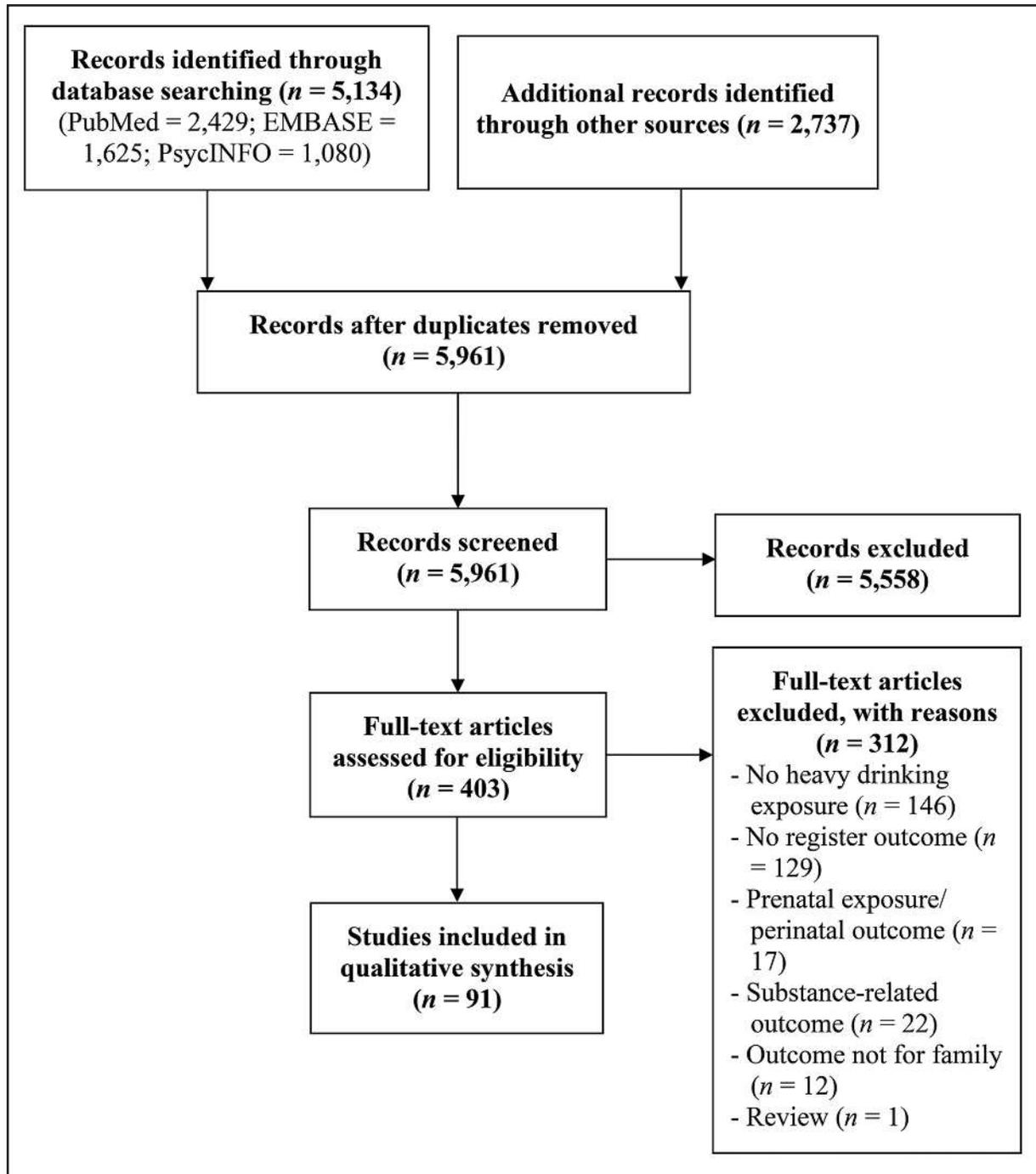


FIGURE 1. Flow diagram of records screened, assessed, and included in the review. *Note:* Some articles were excluded for multiple reasons.

Data charting and extraction

The following descriptive characteristics were extracted from each record: author(s), publication year, title, study focus, study population, length of follow-up, exposure measure (including data source and definition of heavy drinking), relationship between the drinker and family member, outcome

measures (including data source and definition), and main findings. “Exposure” refers to exposure to a heavy-drinking family member. We applied a broad definition of “heavy drinking” because we wanted to include a range of ways in which problematic use of alcohol was operationalized. The extracted data were grouped into overarching categories, and the number of studies that fell into each category was totaled

and reported in tables. Some studies used multiple sources to define heavy drinking and/or included multiple outcome measures.

A vote-counting procedure, also known as a box-score method, was used to summarize the main findings of the subset of studies in which substance use of a family member was the primary explanatory variable. This procedure, chosen because of the heterogeneity of the studies, involved totaling the number of studies with significant positive, significant negative, and nonsignificant findings (Light & Smith, 1971). Substance use was defined as heavy drinking, solely, or in combination with problematic illicit substance use. In reporting our findings, we have used the terms “heavy drinking” and “substance use” broadly to cover the various ways in which the exposures were defined, although these were not necessarily the terms used by the authors of the studies.

Results

Study characteristics

The 91 studies were conducted in seven countries, with the vast majority ($n = 78$) carried out in the Nordic region. Studies were published between 1976 and 2019. Nearly two thirds were published since 2010 ($n = 60$), and, of these, 44 were published since 2015. Approximately 87% of the studies ($n = 79$) had a sole focus on outcomes of children of heavy drinkers. Spouses/partners were the sole focus of two studies. More than one first-degree relative (i.e., children, siblings, parents) was the focus of seven studies, and unspecified family members were the focus of three studies. In 23 of the 91 studies, familial substance use was the primary explanatory variable under investigation, as opposed to one of several risk factors (Supplemental Table A). Heavy drinking was considered a unique exposure in 49 studies, and the remaining 42 studies combined heavy drinking and illicit drug use into a single exposure category (Supplemental Table B).

Exposure measures

There was considerable heterogeneity in the sources used to assess heavy drinking. The majority of studies, however, used at least one register-based measure. Hospital registers as the sole information source were used by 41 studies. These studies defined a heavy drinker as an individual with a hospital admission for an alcohol-related diagnosis, including, for example, alcohol abuse, alcohol dependence, accidental alcohol poisoning, and/or alcoholic cirrhosis of the liver. Informant reports as the sole information source were used by 13 studies; for example, respondents were asked to report whether a family member was a heavy drinker. The various combinations of information sources are presented in Supplemental Table C.

Outcome measures

The register-based outcomes for family members of heavy drinkers covered a range of areas (Supplemental Table D). Mental health outcomes were the most common, followed by mortality (including suicide) and criminal activity. Studies operationalized mental health outcomes as a diagnosis of a mental disorder recorded in an inpatient or outpatient care register or as a purchase of medication intended for the treatment of mental disorders as recorded in a register of prescription medicines. Mortality was defined based on a recorded death in a cause-of-death register. Criminal activity was operationalized as a conviction recorded in a criminal offenses register. Some studies distinguished between categories of crime, such as violent crimes, and others investigated recidivism.

Employment/financial outcomes, physical health conditions, and out-of-home placements were less common, but still comprised approximately 10% of the studies. Employment/financial outcomes consisted of registrations related to periods of unemployment, receipt of social benefits, and disability pensions recorded in registers of labor market participation and social insurance. Outcomes related to physical health were defined as a hospitalization for an injury or disease, based on the International Classification of Diseases (ICD) diagnosis codes and recorded in a patient register, a registration in a clinical disease register, or by sick leave registrations in a national health insurance register. Other outcomes are summarized and described in Supplemental Tables B and D.

Main findings: Studies with substance use as primary explanatory variable

This section summarizes findings in selected outcome areas of the subgroup of 23 studies in which familial substance use was the primary explanatory variable (Table 1) (results and additional outcomes available in Supplemental Table E).

Mental disorders. Of the five studies that assessed risk of nonspecific mental disorders, four studies found that parental substance use was associated with some measure of increased risk (Jääskeläinen et al., 2016; Martikainen et al., 2018; Raitasalo & Holmila, 2017; Raitasalo et al., 2019); however, in two of these studies, the results were mixed. Jääskeläinen et al. (2016) found that parental substance use increased the odds of adolescent mental disorders, but not mental disorders in mid-childhood. Raitasalo et al. (2019) found that both less severe and severe heavy drinking in mothers increased the risk of mental and behavioral disorders in their children compared with children of non-heavy-drinking mothers; but, for fathers, there was only an increased risk for severe heavy drinking. Findings for specific mental disorders are presented in Table 1 and Supple-

TABLE 1. Summary of main findings of 23 studies with substance use as main exposure, grouped by outcome area

Area of harm	Number of studies included (alcohol only/ alcohol + other substances)	Countries	Analysis type (Bivariate Multivariate)	Main findings
Nonspecific psychological illness	5 (2/3)	Denmark (1) Finland (4)	Multivariate	Four of five studies found some significant association between parental substance use and offspring psychiatric morbidity (Jääskeläinen et al., 2016; Martikainen et al., 2018; Raitasalo & Holmila, 2017; Raitasalo et al., 2019).
Mood disorders	1 (1/0)	Finland	Multivariate	Maternal severe heavy drinking increased children's risk of mood disorders; no significant increased risk for paternal heavy drinking (Raitasalo et al., 2019).
Neurotic disorders	1 (1/0)	Finland	Multivariate	Maternal severe heavy drinking increased children's risk of neurotic, stress-related, and somatoform disorders; no significant increased risk for paternal heavy drinking (Raitasalo et al., 2019).
Disorders of psychological development	2 (2/0)	Finland Sweden	Multivariate	Mixed results, with one study showing no significant increased risk for disorders of psychological development among children of heavy drinkers (Raitasalo et al., 2019) and one showing significant increased risk of autism (Sundquist et al., 2014).
Behavioral and emotional disorders	3 (3/0)	Finland (1) Sweden (2)	Multivariate	All studies showed some increased risk of behavioral and emotional disorders, such as attention deficit/hyperactivity disorder, for children of parents with heavy drinking (Long et al., 2018; Raitasalo et al., 2019; Sundquist et al., 2014).
Infant and child mortality	2 (2/0)	Australia United States	Multivariate	Maternal heavy drinking increased risk for sudden infant death syndrome and other causes of infant mortality (O'Leary et al., 2013) and child death (McCutcheon et al., 2019).
Adult and young adult mortality	4 (4/0)	Denmark (2) Sweden (1) United States (1)	Multivariate	Mixed findings depending on cause of death.
Criminality	6 (6/0)	Denmark (1) Australia (1) Sweden (4)	Multivariate (3) Bivariate (3)	Five studies found significant differences in recorded convictions between children exposed to parental heavy drinking and controls (Christoffersen & Soothill, 2003; Hafekost et al., 2017c; Long et al., 2018; Müitzell, 1994; Rydelius, 1981).
Employment	4 (4/0)	Denmark (1) Sweden (3)	Multivariate (1) Bivariate (3)	Parental heavy drinking associated with increased risk of youth unemployment (Christoffersen & Soothill, 2003).
Abuse/neglect	2 (2/0)	Denmark Australia	Multivariate	Parental heavy drinking associated with increased risk of child being a victim of violence (Christoffersen & Soothill, 2003) and of maltreatment (Hafekost et al., 2017).
Placement in residential or foster care	6 (6/0)	Denmark (1) Australia (1) Finland (1) Sweden (3)	Multivariate (3) Bivariate (3)	Parental heavy drinking associated with increased risk of child's placement in residential or foster care (Christoffersen & Soothill, 2003; Hafekost et al., 2017a; Müitzell, 1994; Müitzell, 1995; Raitasalo et al., 2015; Rydelius, 1981).
Education	3 (3/0)	Sweden (1) Australia (2)	Multivariate	Parental heavy drinking associated with poorer school performance and attendance among offspring (Berg et al., 2016; Hafekost et al., 2017b; Johnson et al., 2017)
Disease and injury hospitalizations	4 (3/1)	Finland (3) Australia (1)	Multivariate	Increased risk of hospital admission among the children of substance-using parents (O'Leary & Slack-Smith, 2013; Raitasalo & Holmila, 2017; Raitasalo et al., 2015; Winqvist et al., 2007)
Teenage pregnancy	1 (1/0)	Denmark	Multivariate	Parental heavy drinking associated with increased risk of teenage motherhood (Christoffersen & Soothill, 2003).
Child welfare	3 (3/0)	Sweden	Bivariate	Significant differences between offspring of heavy drinking parents and controls in terms of registrations for child welfare (Müitzell, 1994, 1995; Rydelius, 1981).
Suicide attempts	1 (1/0)	Denmark	Multivariate	Parental heavy drinking not associated with increased risk of suicide attempts (Christoffersen & Soothill, 2003).

mental Table E; these results generally show a similar trend to nonspecific mental disorders.

Mortality. Two studies that investigated infant and child mortality found that maternal heavy drinking was associated with an increased risk of offspring death (McCutcheon et al., 2019; O'Leary et al., 2013). Among the four studies that examined young adult or adult mortality, two found a higher risk of death during the follow-up period among family members of heavy drinkers (Christoffersen & Sothill, 2003; Rogers et al., 2016). One study found no significant association between father's alcohol consumption and risk of suicide or other types of violent mortality, and, for total mortality, found mixed results depending on paternal drinking frequency (Landberg et al., 2018).

Of note, Rogers et al. (2016) was the only study among the 23 studies with substance use as the primary explanatory variable that was not restricted to the parent-child relationship. By including various relationships (i.e., a parent, sibling, or other relative), this study assessed different forms of dose-response and showed elevated risk regarding number of heavy drinkers lived with, years lived with the heavy drinker, and relationship to the drinker, with parental heavy drinking exerting a larger influence than the heavy drinking of other relatives (Rogers et al., 2016).

Criminality. Regarding recorded convictions, five of the six studies that investigated criminality found some significant difference between children exposed to parental heavy drinking and those who were not (Christoffersen & Sothill, 2003; Hafekost et al., 2017c; Long et al., 2018; Müitzell, 1994; Rydelius, 1981). One of these studies found significant differences only among male offspring (Rydelius, 1981).

Education. Three studies investigated educational attainment and found poorer outcomes for children of heavy drinkers in terms of school performance or attendance (Berg et al., 2016; Hafekost et al., 2017b; Johnson et al., 2017). However, in one study (Berg et al., 2016), most of the effects were attributed to co-occurring family psychosocial circumstances.

Abuse and/or neglect and placement in residential or foster care. Both studies that looked at abuse/neglect found a significant association, with one showing that parental heavy drinking was associated with an increased risk of a child being a victim of violence (Christoffersen & Sothill, 2003) and the other showing a significantly increased risk of maltreatment (Hafekost et al., 2017a).

Six studies investigated risk of placement in residential or foster care, and all found significant differences between children of heavy drinking parents and controls (Christoffersen & Sothill, 2003; Hafekost et al., 2017a; Müitzell, 1994, 1995; Raitasalo et al., 2015; Rydelius, 1981). In two early studies, however, the difference was only significant among male offspring (Müitzell, 1995; Rydelius, 1981). Raitasalo et al. (2015) investigated risk of heavy drinking and illicit drug use as separate and combined exposures and found the high-

est risk among children of mothers with combined substance use.

Disease and injury hospitalizations. All four studies of physical illness and injury hospitalizations showed an increased risk among the children of substance-using parents (O'Leary & Slack-Smith, 2013; Raitasalo & Holmila, 2017; Raitasalo et al., 2015; Winqvist et al., 2007). Again, when looking at parental use of different substance categories independently and in combination, Raitasalo et al. (2015) found the highest risk for combined parental alcohol and illicit drug use.

Discussion

This review shows that, overall, register-based research on alcohol-related harms to family members has focused mainly on children of heavy drinkers, with only a small proportion having examined other household relations. Much of this research has drawn upon hospital records to identify heavy drinkers, and most studies have investigated a range of risk factors rather than having heavy drinking as a primary focus.

The fact that nearly all research focused on children as victims of family members' heavy drinking is somewhat surprising, given that prior survey research indicates that having a spouse with an alcohol problem is associated with an increased risk for psychological disorders, mental distress, victimization, and injury (Dawson et al., 2007; Rognmo et al., 2013) and that alcohol is a risk factor for intimate partner violence (Abramsky et al., 2011). On the other hand, this result makes sense in that conducting survey research on children is challenging (Einarsdóttir, 2007), making register-based research an attractive alternative. Because register-based studies use existing data and do not require active participation of the research subject, they may be particularly apt for exploring alcohol's harms to children.

Record linkage, in which a register-based measure of exposure is linked with another register-based outcome, was used overwhelmingly by the studies. This means that the alcohol problems of the drinker needed to be sufficiently large to produce, for example, a record of a hospitalization, death, or criminal offense due to an alcohol-related cause. This approach captures mainly the more extreme end of the spectrum of harmful and hazardous alcohol use (Babor et al., 2001; Saha et al., 2006), and thus studies that rely solely on register-based definitions of exposure will capture a fraction of the total cases (Miettunen et al., 2011). Furthermore, alcohol-related disorders are particularly stigmatized conditions (Schomerus et al., 2011) and therefore may be underreported in administrative data, for example, as a cause of death (Cipriani et al., 2001; Rehm et al., 2017).

General population surveys investigating alcohol's harms to children have captured some of the same domains covered by studies included in this review, such as physical health and abuse/neglect. These areas have been probed using

survey questions, such as, “In the last 12 months, has one or more of the children who you are responsible for . . . been left in an unsupervised or unsafe situation/been yelled at, criticized or otherwise verbally abused/been physically hurt/witnessed serious violence in the home . . . because of someone’s drinking?” (Laslett et al., 2019). In addition to assuming attribution of a causal link between heavy drinking and harm inherent in such survey items, the questions require some level of interpretation of the outcome on the part of the adult respondent. Surveys investigating alcohol’s harms to family members also include sensitive questions and therefore may risk underreporting by participants (Tourangeau & Yan, 2007). On the other hand, register-based studies have addressed these domains by targeting highly specific and precisely defined harms. For instance, hospitalizations because of injuries, illness, or psychiatric disorder diagnoses are recorded in healthcare registers (Raitasalo & Holmila, 2017), and the association with heavy drinking is made by linking registers.

The findings from the current review are generally consistent with previous reviews of largely non-register-based studies, which demonstrate increased psychosocial problems among children exposed to parental substance use (Harter, 2000; Kuppens et al., 2020; Rossow et al., 2016). However, the present focus on register-based studies offers a unique contribution. As demonstrated in this review, register-based studies can inform on specific harms, such as precise diagnostic categories in the areas of physical and mental health (O’Leary & Slack-Smith, 2013; Raitasalo et al., 2015, 2019). The large sample sizes in most register-based studies also ensure adequate power to detect a hypothesized effect, which may be lacking when using other study designs (Harter, 2000).

The use of registers allows for tracking children from birth through adolescence and beyond. Studies included in previous reviews tended to focus on the adolescent period, or, when young children were included, they had a narrow emphasis on externalizing and internalizing problems (Kuppens et al., 2020; Rossow et al., 2016). In contrast, studies included in the current review cover a range of physical and mental health outcomes also among very young children (e.g., O’Leary & Slack-Smith, 2013; Raitasalo & Holmila, 2017). The use of register data also allows for testing theory-based hypotheses regarding the contribution of biological factors, for example, by looking at effects of timing of alcohol use disorder diagnoses in relation to pregnancy, or by separating socialization from genetic mechanisms by examining “lived with” versus “not lived with” immediate family members (Hafekost et al. 2017b; Long et al., 2018; O’Leary et al., 2013; Raitasalo & Holmila, 2017).

Although the causal pathways connecting alcohol and adverse outcomes for family members will likely include both genetic and environmental mechanisms, the relative strengths of influence of such mechanisms may differ de-

pending on the outcome. Therefore, using register data to separate the effects of living with heavy drinkers from those of being genetically related to them represents an important contribution (Kendler et al., 2015b; Khemiri et al., 2020).

Limitations

To provide an overview of existing register-based research, this scoping review has covered a heterogeneous group of studies with varying population sizes, follow-up periods, definitions of exposures and outcomes, and covariates. However, this heterogeneity limited us to using a vote-counting procedure, which is not ideal for summarizing findings across studies (Higgins et al., 2019). Furthermore, as this review aimed to cast a wide net to identify all register-based studies of alcohol’s harms to family members, studies were included that did not distinguish between heavy drinking and illicit drug use.

Other than a recent meta-analysis of longitudinal studies investigating the association between parental substance use and various domains of child well-being (Kuppens et al., 2020), we are unaware of a substantial body of research comparing effects of alcohol and drug use on family members. Differences in the legal status of the substances could have an influence on the harms to family members; for instance, Kuppens et al. (2020) found a stronger association for illicit drug use compared with heavy drinking. Thus, there could be some concern about our ability to draw conclusions about heavy drinking as a unique exposure. However, 87% of the studies for which specific findings were presented included heavy drinking as a single exposure. Moreover, heavy drinking was an independent study exposure in 14 of the 16 areas of harm described in Table 1.

Since our search strategy prioritized household family members, some studies investigating harms to extended family members may have been missed. Such studies could have permitted a dose-response analysis—an examination of whether there is a gradation of the effect, such that family members more immediately connected to the drinker experience a greater degree of harm (Rogers et al., 2016).

Conclusions and future research

Survey- and register-based methodologies can be seen as complementary. Whereas surveys can cover less severe, less tangible, and perhaps shorter term outcomes, register-based methods address more serious, persistent, and rare outcomes. Consideration of findings from these diverse methodologies represents an opportunity for a triangulation of data, wherein multiple data sources are used to verify and complement findings or point to inconsistencies in existing research.

This review demonstrates that a large body of register-based research has been produced on the topic of alcohol’s harms to children of parents with the most severe alcohol

problems. Findings demonstrate increased risk in areas such as hospitalizations for illness and injuries (Raitasalo et al., 2015), mental health diagnoses (Long et al., 2018; Raitasalo et al., 2019; Sundquist et al., 2014), convictions (Christoffersen & Soothill, 2003; Hafekost et al., 2017c; Long et al., 2018), and poor school performance and attendance (Berg et al., 2016; Hafekost et al., 2017b; Johnson et al., 2017).

Future research could assess the impact of alcohol use on household relations other than children of heavy drinkers. Whereas it may be burdensome to assess the experiences of both drinkers and family members using survey methods, population registers allow for the linking of parents, children, partners, and siblings, providing relatively easy access to existing data on relatives. In this way, researchers may explore the extent to which alcohol's harms to others has permeated family life.

References

- Abramsky, T., Watts, C. H., Garcia-Moreno, C., Devries, K., Kiss, L., Ellsberg, M., . . . Heise, L. (2011). What factors are associated with recent intimate partner violence? Findings from the WHO multi-country study on women's health and domestic violence. *BMC Public Health, 11*, 109. doi:10.1186/1471-2458-11-109
- Ahrén, J. C., Chiesa, F., Af Klinteberg, B., & Koupil, I. (2012). Psychosocial determinants and family background in anorexia nervosa—Results from the Stockholm Birth Cohort Study. *International Journal of Eating Disorders, 45*, 362–369. doi:10.1002/eat.20953
- Alm, S., Brodin Låftman, S., & Bohman, H. (2019). Poor family relationships in adolescence and the risk of premature death: Findings from the Stockholm Birth Cohort Study. *International Journal of Environmental Research and Public Health, 16*, E1690. doi:10.3390/ijerph16101690
- Appelqvist-Schmidlechner, K., Upanne, M., Henriksson, M., Parkkola, K., & Stengård, E. (2010). Young men exempted from compulsory military or civil service in Finland—A group of men in need of psychosocial support? *Scandinavian Journal of Public Health, 38*, 168–176. doi:10.1177/1403494809357103
- Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology, 8*, 19–32. doi:10.1080/1364557032000119616
- Arola, R., Antila, H., Riipinen, P., Hakko, H., Riala, K., & Kantojärvi, L. (2016). Borderline personality disorder associates with violent criminality in women: A population based follow-up study of adolescent psychiatric inpatients in Northern Finland. *Forensic Science International, 266*, 389–395. doi:10.1016/j.forsciint.2016.06.028
- Babor, T. F., de la Fuente, J. R., Saunders, J., & Grant, M. (2001). *The Alcohol Use Disorders Identification Test: Guidelines for use in primary care*. Geneva, Switzerland: World Health Organization.
- Berg, L., Bäck, K., Vinnerljung, B., & Hjern, A. (2016). Parental alcohol-related disorders and school performance in 16-year-olds—A Swedish national cohort study. *Addiction, 111*, 1795–1803. doi:10.1111/add.13454
- Björkenstam, C., Björkenstam, E., Hjern, A., Bodén, R., & Reutfors, J. (2014). Suicide in first episode psychosis: A nationwide cohort study. *Schizophrenia Research, 157*, 1–7. doi:10.1016/j.schres.2014.05.010
- Björkenstam, C., Kosidou, K., & Björkenstam, E. (2017a). Childhood adversity and risk of suicide: Cohort study of 548 721 adolescents and young adults in Sweden. *BMJ, 357*, j1334. doi:10.1136/bmj.j1334
- Björkenstam, E., Björkenstam, C., Jablonska, B., & Kosidou, K. (2018a). Cumulative exposure to childhood adversity, and treated attention deficit/hyperactivity disorder: A cohort study of 543 650 adolescents and young adults in Sweden. *Psychological Medicine, 48*, 498–507. doi:10.1017/S0033291717001933
- Björkenstam, E., Burström, B., Hjern, A., Vinnerljung, B., Kosidou, K., & Berg, L. (2019). Cumulative childhood adversity, adolescent psychiatric disorder and violent offending in young adulthood. *European Journal of Public Health, 29*, 855–861. doi:10.1093/eurpub/ckz089
- Björkenstam, E., Burström, B., Vinnerljung, B., & Kosidou, K. (2016a). Childhood adversity and psychiatric disorder in young adulthood: An analysis of 107,704 Swedes. *Journal of Psychiatric Research, 77*, 67–75. doi:10.1016/j.jpsychires.2016.02.018
- Björkenstam, E., Dalman, C., Vinnerljung, B., Weitoft, G. R., Walder, D. J., & Burström, B. (2016b). Childhood household dysfunction, school performance and psychiatric care utilisation in young adults: A register study of 96 399 individuals in Stockholm County. *Journal of Epidemiology and Community Health, 70*, 473–480. doi:10.1136/jech-2015-206329
- Björkenstam, E., Hjern, A., Björkenstam, C., & Kosidou, K. (2018b). Association of cumulative childhood adversity and adolescent violent offending with suicide in early adulthood. *JAMA Psychiatry, 75*, 185–193. doi:10.1001/jamapsychiatry.2017.3788
- Björkenstam, E., Hjern, A., Mittendorfer-Rutz, E., Vinnerljung, B., Hallqvist, J., & Ljung, R. (2013). Multi-exposure and clustering of adverse childhood experiences, socioeconomic differences and psychotropic medication in young adults. *PLoS One, 8*, e53551. doi:10.1371/journal.pone.0053551
- Björkenstam, E., Kosidou, K., & Björkenstam, C. (2016c). Childhood household dysfunction and risk of self-harm: A cohort study of 107 518 young adults in Stockholm County. *International Journal of Epidemiology, 45*, 501–511. doi:10.1093/ije/dyw012
- Björkenstam, E., Vinnerljung, B., & Hjern, A. (2017b). Impact of childhood adversities on depression in early adulthood: A longitudinal cohort study of 478,141 individuals in Sweden. *Journal of Affective Disorders, 223*, 95–100. doi:10.1016/j.jad.2017.07.030
- Bohman, M. (1978). Some genetic aspects of alcoholism and criminality. A population of adoptees. *Archives of General Psychiatry, 35*, 269–276. doi:10.1001/archpsyc.1978.01770270019001
- Bould, H., Koupil, I., Dalman, C., DeStavola, B., Lewis, G., & Magnusson, C. (2015). Parental mental illness and eating disorders in offspring. *International Journal of Eating Disorders, 48*, 383–391. doi:10.1002/eat.22325
- Byrne, M., Agerbo, E., & Mortensen, P. B. (2002). Family history of psychiatric disorders and age at first contact in schizophrenia: An epidemiological study. *British Journal of Psychiatry, 181*, Supplement 43, s19–s25. doi:10.1192/bjp.181.43.s19
- Christoffersen, M. N. (2000). Growing up with unemployment: A study of parental unemployment and children's risk of abuse and neglect based on national longitudinal 1973 birth cohorts in Denmark. *Childhood, 7*, 421–438. doi:10.1177/0907568200007004003
- Christoffersen, M. N., Francis, B., & Soothill, K. (2003a). An upbringing to violence? Identifying the likelihood of violent crime among the 1966 birth cohort in Denmark. *Journal of Forensic Psychiatry & Psychology, 14*, 367–381. doi:10.1080/1478994031000117830
- Christoffersen, M. N., Poulsen, H. D., & Nielsen, A. (2003b). Attempted suicide among young people: Risk factors in a prospective register based study of Danish children born in 1966. *Acta Psychiatrica Scandinavica, 108*, 350–358. doi:10.1034/j.1600-0447.2003.00165.x
- Christoffersen, M. N., & Soothill, K. (2003). The long-term consequences of parental alcohol abuse: A cohort study of children in Denmark. *Journal of Substance Abuse Treatment, 25*, 107–116. doi:10.1016/S0740-5472(03)00116-8
- Cipriani, F., Landucci, S., & Bloomfield, K. (2001). Alcohol-related mortality in Europe: A tentative analysis from the EU project "Alcohol Consumption and Alcohol Problems among Women in European Countries." *Substance Abuse, 22*, 55–67. doi:10.1080/08897070109511445

- Curman, H., & Nylander, I. (1976). A 10-year prospective follow-up study of 2 268 cases at the child guidance clinics in Stockholm. *Acta Paediatrica Scandinavica*, *65*, Supplement 260, 1–71.
- Daniels, J. L., Forssen, U., Hultman, C. M., Cnattingius, S., Savitz, D. A., Feychting, M., & Sparen, P. (2008). Parental psychiatric disorders associated with autism spectrum disorders in the offspring. *Pediatrics*, *121*, e1357–e1362. doi:10.1542/peds.2007-2296
- Dawson, D. A., Grant, B. F., Chou, S. P., & Stinson, F. S. (2007). The impact of partner alcohol problems on women's physical and mental health. *Journal of Studies on Alcohol and Drugs*, *68*, 66–75. doi:10.15288/jsad.2007.68.66
- Einarsdóttir, J. (2007). Research with children: Methodological and ethical challenges. *European Early Childhood Education Research Journal*, *15*, 197–211. doi:10.1080/13502930701321477
- Estrada, F., & Nilsson, A. (2012). Does it cost more to be a female offender? A life-course study of childhood circumstances, crime, drug abuse, and living conditions. *Feminist Criminology*, *7*, 196–219. doi:10.1177/1557085111429783
- Falk, O., Wallinius, M., Lundström, S., Frisell, T., Anckarsäter, H., & Kerekes, N. (2014). The 1% of the population accountable for 63% of all violent crime convictions. *Social Psychiatry and Psychiatric Epidemiology*, *49*, 559–571. doi:10.1007/s00127-013-0783-y
- Hafekost, K., Lawrence, D., O'Leary, C., Bower, C., O'Donnell, M., Semmens, J., & Zubrick, S. R. (2017a). Maternal alcohol use disorder and subsequent child protection contact: A record-linkage population cohort study. *Child Abuse & Neglect*, *72*, 206–214. doi:10.1016/j.chiabu.2017.08.010
- Hafekost, K., Lawrence, D., O'Leary, C., Bower, C., Semmens, J., & Zubrick, S. R. (2017b). Maternal alcohol use disorder and child school attendance outcomes for non-Indigenous and Indigenous children in Western Australia: A population cohort record linkage study. *BMJ Open*, *7*, e015650. doi:10.1136/bmjopen-2016-015650
- Hafekost, K., Lawrence, D., O'Leary, C., Bower, C., Semmens, J., & Zubrick, S. R. (2017c). Maternal alcohol use disorder and risk of child contact with the justice system in Western Australia: A population cohort record linkage study. *Alcoholism: Clinical and Experimental Research*, *41*, 1452–1460. doi:10.1111/acer.13426
- Halonen, J. I., Kivimäki, M., Vahtera, J., Pentti, J., Virtanen, M., Ervasti, J., . . . Lallukka, T. (2017). Childhood adversity, adult socioeconomic status and risk of work disability: A prospective cohort study. *Occupational and Environmental Medicine*, *74*, 659–666. doi:10.1136/oemed-2017-104319
- Hamann, C. R., Egeberg, A., Silverberg, J. I., Gislason, G., Skov, L., & Thyssen, J. P. (2019). Exploring the association between parental psychiatric disease and childhood atopic dermatitis: A matched case-control study. *Journal of the European Academy of Dermatology and Venereology*, *33*, 725–734. doi:10.1111/jdv.15321
- Harter, S. L. (2000). Psychosocial adjustment of adult children of alcoholics: A review of the recent empirical literature. *Clinical Psychology Review*, *20*, 311–337. doi:10.1016/S0272-7358(98)00084-1
- Higgins, J. P., Thomas, J., Chandler, J., Cumpston, M., Li, T., Page, M. J., & Welch, V. A. (2019). *Cochrane handbook for systematic reviews of interventions*. New York, NY: John Wiley & Sons.
- Hutchinson, D., Mattick, R., Braunstein, D., Maloney, E., & Wilson, J. (2014). *The impact of alcohol use disorders on family life: A review of the empirical literature*. Sydney, Australia: National Drug & Alcohol Research Centre. Retrieved from <https://ndarc.med.unsw.edu.au/resource/impact-alcohol-use-disorders-family-life-review-empirical-literature>
- Jääskeläinen, M., Holmila, M., Notkola, I. L., & Raitasalo, K. (2016). Mental disorders and harmful substance use in children of substance abusing parents: A longitudinal register-based study on a complete birth cohort born in 1991. *Drug and Alcohol Review*, *35*, 728–740. doi:10.1111/dar.12417
- Johnson, S. E., O'Leary, C., Bower, C., Lawrence, D., Cunningham, N., Semmens, J., & Zubrick, S. R. (2017). Maternal alcohol disorders and school achievement: A population cohort record linkage study in Western Australia. *BMJ Open*, *7*, e014599. doi:10.1136/bmjopen-2016-014599
- Joutsenniemi, K., Moustgaard, H., Koskinen, S., Ripatti, S., & Martikainen, P. (2011). Psychiatric comorbidity in couples: A longitudinal study of 202,959 married and cohabiting individuals. *Social Psychiatry and Psychiatric Epidemiology*, *46*, 623–633. doi:10.1007/s00127-010-0228-9
- Karriker-Jaffe, K. J., Greenfield, T. K., & Kaplan, L. M. (2017). Distress and alcohol-related harms from intimates, friends, and strangers. *Journal of Substance Use*, *22*, 434–441. doi:10.1080/14659891.2016.1232761
- Kendler, K. S., Larsson Lönn, S., Morris, N. A., Sundquist, J., Långström, N., & Sundquist, K. (2014). A Swedish national adoption study of criminality. *Psychological Medicine*, *44*, 1913–1925. doi:10.1017/S0033291713002638
- Kendler, K. S., Ohlsson, H., Maes, H. H., Sundquist, K., Lichtenstein, P., & Sundquist, J. (2015a). A population-based Swedish Twin and Sibling Study of cannabis, stimulant and sedative abuse in men. *Drug and Alcohol Dependence*, *149*, 49–54. doi:10.1016/j.drugalcdep.2015.01.016
- Kendler, K. S., Ohlsson, H., Sundquist, J., & Sundquist, K. (2015b). Triparental families: A new genetic-epidemiological design applied to drug abuse, alcohol use disorders, and criminal behavior in a Swedish national sample. *American Journal of Psychiatry*, *172*, 553–560. doi:10.1176/appi.ajp.2014.14091127
- Kendler, K. S., Ohlsson, H., Sundquist, J., & Sundquist, K. (2020). Maternal half-sibling families with discordant fathers: A contrastive design assessing cross-generational paternal genetic transmission of alcohol use disorder, drug abuse and major depression. *Psychological Medicine*, *50*, 973–980. doi:10.1017/S0033291719000874
- Khemiri, L., Larsson, H., Kuja-Halkola, R., D'Onofrio, B. M., Lichtenstein, P., Jayaram-Lindström, N., & Latvala, A. (2020). Association of parental substance use disorder with offspring cognition: A population family-based study. *Addiction*, *115*, 326–336. doi:10.1111/add.14813
- King-Hele, S. A., Abel, K. M., Webb, R. T., Mortensen, P. B., Appleby, L., & Pickles, A. R. (2007). Risk of sudden infant death syndrome with parental mental illness. *Archives of General Psychiatry*, *64*, 1323–1330. doi:10.1001/archpsyc.64.11.1323
- Kjelsberg, E., Neegaard, E., & Dahl, A. A. (1994). Suicide in adolescent psychiatric inpatients: Incidence and predictive factors. *Acta Psychiatrica Scandinavica*, *89*, 235–241. doi:10.1111/j.1600-0447.1994.tb01507.x
- Klinterberg, B., Almquist, Y., Beijer, U., & Rydelius, P.-A. (2011). Family psychosocial characteristics influencing criminal behaviour and mortality—Possible mediating factors: A longitudinal study of male and female subjects in the Stockholm Birth Cohort. *BMC Public Health*, *11*, 756. doi:10.1186/1471-2458-11-756
- Knop, J., Penick, E. C., L Mortensen, E., Nickel, E. J., Gabrielli, W. F., Jensen, P., & Mednick, S. A. (2004). Prediction of mortality at age 40 in Danish males at high and low risk for alcoholism. *Acta Psychiatrica Scandinavica*, *110*, 476–482. doi:10.1111/j.1600-0447.2004.00393.x
- Korpimäki, S. K., Sumanen, M. P., Sillanmäki, L. H., & Mattila, K. J. (2010). Cancer in working-age is not associated with childhood adversities. *Acta Oncologica*, *49*, 436–440. doi:10.3109/02841860903521103
- Kotch, J. B., Browne, D. C., Dufort, V., Winsor, J., & Catellier, D. (1999). Predicting child maltreatment in the first 4 years of life from characteristics assessed in the neonatal period. *Child Abuse & Neglect*, *23*, 305–319. doi:10.1016/S0145-2134(99)00003-4
- Kuppens, S., Moore, S. C., Gross, V., Lowthian, E., & Siddaway, A. P. (2020). The enduring effects of parental alcohol, tobacco, and drug use on child well-being: A multilevel meta-analysis. *Development and Psychopathology*, *32*, 765–778. doi:10.1017/S0954579419000749
- Landberg, J., Danielsson, A. K., Falkstedt, D., & Hemmingsson, T. (2018). Fathers' alcohol consumption and long-term risk for mortality in offspring. *Alcohol and Alcoholism*, *53*, 753–759. doi:10.1093/alcal/agy058

- Larsen, J. T., Munk-Olsen, T., Bulik, C. M., Thornton, L. M., Koch, S. V., Mortensen, P. B., & Petersen, L. (2017). Early childhood adversities and risk of eating disorders in women: A Danish register-based cohort study. *International Journal of Eating Disorders, 50*, 1404–1412. doi:10.1002/eat.22798
- Larsson, H. J., Eaton, W. W., Madsen, K. M., Vestergaard, M., Olesen, A. V., Agerbo, E., . . . Mortensen, P. B. (2005). Risk factors for autism: Perinatal factors, parental psychiatric history, and socioeconomic status. *American Journal of Epidemiology, 161*, 916–925, discussion 926–928. doi:10.1093/aje/kwi123
- Laslett, A. M., Room, R., Ferris, J., Wilkinson, C., Livingston, M., & Mugavin, J. (2011). Surveying the range and magnitude of alcohol's harm to others in Australia. *Addiction, 106*, 1603–1611. doi:10.1111/j.1360-0443.2011.03445.x
- Laslett, A.-M., Room, R., Waleewong, O., Stanesby, O., Callinan, S., & World Health Organization. (2019). *Harm to others from drinking: Patterns in nine societies*. Geneva, Switzerland: World Health Organization. Retrieved from <https://apps.who.int/iris/handle/10665/329393>
- Light, R., & Smith, P. (1971). Accumulating evidence: Procedures for resolving contradictions among different research studies. *Harvard Educational Review, 41*, 429–471. doi:10.17763/haer.41.4.437714870334w144
- Lindberg, L., & Hjern, A. (2003). Risk factors for anorexia nervosa: A national cohort study. *International Journal of Eating Disorders, 34*, 397–408. doi:10.1002/eat.10221
- Lindblad, F., Ringbäck Weitof, G., & Hjern, A. (2011). Maternal and paternal psychopathology increases risk of offspring ADHD equally. *Epidemiology and Psychiatric Sciences, 20*, 367–372. doi:10.1017/S2045796011000564
- Long, E. C., Lönn, S. L., Sundquist, J., Sundquist, K., & Kendler, K. S. (2018). The role of parent and offspring sex on risk for externalizing psychopathology in offspring with parental alcohol use disorder: A national Swedish study. *Social Psychiatry and Psychiatric Epidemiology, 53*, 1381–1389. doi:10.1007/s00127-018-1563-5
- Lund, I. O., & Bukten, A. (2015). Harm to others from substance use and abuse: The underused potential in nationwide registers. *Substance Abuse: Research and Treatment, 9, Supplement 2*, 33–38. doi:10.4137/SART.S23545
- Lund, T., Andersen, J. H., Winding, T. N., Biering, K., & Labriola, M. (2013). Negative life events in childhood as risk indicators of labour market participation in young adulthood: A prospective birth cohort study. *PLoS One, 8*, e75860. doi:10.1371/journal.pone.0075860
- Maclean, M. J., Sims, S. A., & O'Donnell, M. (2019). Role of pre-existing adversity and child maltreatment on mental health outcomes for children involved in child protection: Population-based data linkage study. *BMJ Open, 9*, e029675. doi:10.1136/bmjopen-2019-029675
- Mannerfelt, C., & Håkansson, A. (2018). Substance use, criminal recidivism, and mortality in criminal justice clients: A comparison between men and women. *Journal of Addiction, 2018*, Article ID 1689637. doi:10.1155/2018/1689637
- Martikainen, P., Korhonen, K., Moustgaard, H., Aaltonen, M., & Remes, H. (2018). Substance abuse in parents and subsequent risk of offspring psychiatric morbidity in late adolescence and early adulthood: A longitudinal analysis of siblings and their parents. *Social Science & Medicine, 217*, 106–111. doi:10.1016/j.socscimed.2018.09.060
- McCutcheon, V. V., Bucholz, K. K., Houston-Ludlam, A. N., & Heath, A. C. (2019). Elevated maternal and child mortality among women with multiple DUI convictions compared with socio-demographically matched controls. *Addiction, 114*, 1981–1991. doi:10.1111/add.14762
- Meltzer-Brody, S., Larsen, J. T., Petersen, L., Guintivano, J., Florio, A. D., Miller, W. C., . . . Munk-Olsen, T. (2018). Adverse life events increase risk for postpartum psychiatric episodes: A population-based epidemiologic study. *Depression and Anxiety, 35*, 160–167. doi:10.1002/da.22697
- Miettunen, J., Suvisaari, J., Haukka, J., & Isohanni, M. (2011). Use of register data for psychiatric epidemiology in the Nordic countries. In M. T. Tsuang, M. Tohen, & P. B. Jones (Eds.), *Textbook of psychiatric epidemiology* (3rd ed.). Chichester, England: John Wiley & Sons, Ltd.
- Mittendorfer-Rutz, E., Rasmussen, F., & Wasserman, D. (2008). Familial clustering of suicidal behaviour and psychopathology in young suicide attempters. A register-based nested case control study. *Social Psychiatry and Psychiatric Epidemiology, 43*, 28–36. doi:10.1007/s00127-007-0266-0
- Mützell, S. (1994). Mortality, suicide, social maladjustment and criminality among male alcoholic parents and men from the general population and their offspring. *International Journal of Adolescence and Youth, 4*, 305–328. doi:10.1080/02673843.1994.9747743
- Mützell, S. (1995). Are children of alcoholic mothers more psychologically damaged compared with children of mothers from the general population? *Early Child Development and Care, 109*, 159–173. doi:10.1080/0300443951090112
- Munn, Z., Peters, M. D. J., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology, 18*, 143. doi:10.1186/s12874-018-0611-x
- Musliner, K. L., Munk-Olsen, T., Laursen, T. M., Eaton, W. W., Zandi, P. P., & Mortensen, P. B. (2016). Heterogeneity in 10-year course trajectories of moderate to severe major depressive disorder: A Danish national register-based study. *JAMA Psychiatry, 73*, 346–353. doi:10.1001/jamapsychiatry.2015.3365
- Mustonen, A., Ahokas, T., Nordström, T., Murray, G. K., Mäki, P., Jääskeläinen, E., . . . Niemela, S. (2018a). Smokin' hot: Adolescent smoking and the risk of psychosis. *Acta Psychiatrica Scandinavica, 138*, 5–14. doi:10.1111/acps.12863
- Mustonen, A., Niemelä, S., McGrath, J. J., Murray, G. K., Nordström, T., Mäki, P., . . . Scott, J. G. (2018b). Adolescent inhalant use and psychosis risk—A prospective longitudinal study. *Schizophrenia Research, 201*, 360–366. doi:10.1016/j.schres.2018.05.013
- Nilsson, S. F., Laursen, T. M., Hjorthøj, C., Thorup, A., & Nordentoft, M. (2017). Risk of psychiatric disorders in offspring of parents with a history of homelessness during childhood and adolescence in Denmark: A nationwide, register-based, cohort study. *The Lancet Public Health, 2*, e541–e550. doi:10.1016/S2468-2667(17)30210-4
- O'Donnell, M., Maclean, M. J., Sims, S., Morgan, V. A., Leonard, H., & Stanley, F. J. (2015). Maternal mental health and risk of child protection involvement: Mental health diagnoses associated with increased risk. *Journal of Epidemiology and Community Health, 69*, 1175–1183. doi:10.1136/jech-2014-205240
- O'Leary, C. M., Jacoby, P. J., Bartu, A., D'Antoine, H., & Bower, C. (2013). Maternal alcohol use and sudden infant death syndrome and infant mortality excluding SIDS. *Pediatrics, 131*, e770–e778. doi:10.1542/peds.2012-1907
- O'Leary, C. M., & Slack-Smith, L. M. (2013). Dental hospital admissions in the children of mothers with an alcohol-related diagnosis: A population-based, data-linkage study. *Journal of Pediatrics, 163*, 515–520.e1. doi:10.1016/j.jpeds.2013.02.020
- Peacock, A., Leung, J., Larney, S., Colledge, S., Hickman, M., Rehm, J., . . . Degenhardt, L. (2018). Global statistics on alcohol, tobacco and illicit drug use: 2017 status report. *Addiction, 113*, 1905–1926. doi:10.1111/add.14234
- Petersen, S. M., Toftdahl, N. G., Nordentoft, M., & Hjorthøj, C. (2019). Schizophrenia is associated with increased risk of subsequent substance abuse diagnosis: A nation-wide population-based register study. *Addiction, 114*, 2217–2226. doi:10.1111/add.14746
- Pham, M. T., Raji, A., Greig, J. D., Sargeant, J. M., Papadopoulos, A., & McEwen, S. A. (2014). A scoping review of scoping reviews: Advancing the approach and enhancing the consistency. *Research Synthesis Methods, 5*, 371–385. doi:10.1002/jrsm.1123

- Raitasalo, K., & Holmila, M. (2017). Parental substance abuse and risks to children's safety, health and psychological development. *Drugs: Education, Prevention & Policy*, *24*, 17–22. doi:10.1080/09687637.2016.1232371
- Raitasalo, K., Holmila, M., Autti-Rämö, I., Notkola, I. L., & Tapanainen, H. (2015). Hospitalisations and out-of-home placements of children of substance-abusing mothers: A register-based cohort study. *Drug and Alcohol Review*, *34*, 38–45. doi:10.1111/dar.12121
- Raitasalo, K., Holmila, M., Jääskeläinen, M., & Santalahti, P. (2019). The effect of the severity of parental alcohol abuse on mental and behavioural disorders in children. *European Child & Adolescent Psychiatry*, *28*, 913–922. doi:10.1007/s00787-018-1253-6
- Ranta, J., & Raitasalo, K. (2015). Disorders of cognitive and emotional development in children of mothers with substance abuse and psychiatric disorders. *Nordisk Alkohol- & Narkotikatidskrift*, *32*, 591–604. doi:10.1515/nsad-2015-0056
- Rehm, J., Gmel, G. E., Sr., Gmel, G., Hasan, O. S. M., Imtiaz, S., Popova, S., . . . Shuper, P. A. (2017). The relationship between different dimensions of alcohol use and the burden of disease—An update. *Addiction*, *112*, 968–1001. doi:10.1111/add.13757
- Ringbäck Weitoft, G., Hjern, A., Batljan, I., & Vinnerljung, B. (2008). Health and social outcomes among children in low-income families and families receiving social assistance—A Swedish national cohort study. *Social Science & Medicine*, *66*, 14–30. doi:10.1016/j.socscimed.2007.07.031
- Rogers, R. G., Lawrence, E. M., & Montez, J. K. (2016). Alcohol's collateral damage: Childhood exposure to problem drinkers and subsequent adult mortality risk. *Social Forces*, *95*, 809–836. doi:10.1093/sf/sow074
- Rognmo, K., Torvik, F. A., Røysamb, E., & Tambs, K. (2013). Alcohol use and spousal mental distress in a population sample: The Nord-Trøndelag Health Study. *BMC Public Health*, *13*, 319. doi:10.1186/1471-2458-13-319
- Room, R., Laslett, A.-M., & Jiang, H. (2016). Conceptual and methodological issues in studying alcohol's harm to others. *Nordisk Alkohol- & Narkotikatidskrift*, *33*, 455–478. doi:10.1515/nsad-2016-0038
- Rosow, I. (2016, January 20). How well do survey studies capture alcohol's harm to others? *Substance Abuse: Research and Treatment*, *9*, Supplement 2, 99–106. doi:10.4137/sart.S23503
- Rosow, I., Felix, L., Keating, P., & McCambridge, J. (2016). Parental drinking and adverse outcomes in children: A scoping review of cohort studies. *Drug and Alcohol Review*, *35*, 397–405. doi:10.1111/dar.12319
- Runyan, D. K., Gould, C. L., Trost, D. C., & Loda, F. A. (1982). Determinants of foster care placement for the maltreated child. *Child Abuse & Neglect*, *6*, 343–350. doi:10.1016/0145-2134(82)90039-4
- Rydellius, P. A. (1981). Children of alcoholic fathers. Their social adjustment and their health status over 20 years. *Acta Paediatrica Scandinavica*, *286*, Supplement, 1–89.
- Saha, T. D., Chou, S. P., & Grant, B. F. (2006). Toward an alcohol use disorder continuum using item response theory: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Psychological Medicine*, *36*, 931–941. doi:10.1017/S003329170600746X
- Schomerus, G., Lucht, M., Holzinger, A., Matschinger, H., Carta, M. G., & Angermeyer, M. C. (2011). The stigma of alcohol dependence compared with other mental disorders: A review of population studies. *Alcohol and Alcoholism*, *46*, 105–112. doi:10.1093/alcac/agg089
- Sørensen, H. J., Mortensen, E. L., Reinisch, J. M., & Mednick, S. A. (2009). Parental psychiatric hospitalisation and offspring schizophrenia. *World Journal of Biological Psychiatry*, *10*, 571–575. doi:10.1080/15622970701472078
- Staines, G. L., Magura, S., Foote, J., Deluca, A., & Kosanke, N. (2001). Polysubstance use among alcoholics. *Journal of Addictive Diseases*, *20*, 57–73. doi:10.1300/J069v20n04_06
- Staton-Tindall, M., Sprang, G., Clark, J., Walker, R., & Craig, C. D. (2013). Caregiver substance use and child outcomes: A systematic review. *Journal of Social Work Practice in the Addictions*, *13*, 6–31. doi:10.1080/1533256X.2013.752272
- Stattin, H., & Romelsjö, A. (1995). Adult mortality in the light of criminality, substance abuse, and behavioural and family-risk factors in adolescence. *Criminal Behaviour and Mental Health*, *5*, 279–311. doi:10.1002/cbm.1995.5.4.279
- Steinhausen, H. C., Foldager, L., Perto, G., & Munk-Jørgensen, P. (2009). Family aggregation of mental disorders in the nationwide Danish three generation study. *European Archives of Psychiatry and Clinical Neuroscience*, *259*, 270–277. doi:10.1007/s00406-008-0865-0
- Steinhausen, H. C., Jakobsen, H., Helenius, D., Munk-Jørgensen, P., & Strober, M. (2015). A nation-wide study of the family aggregation and risk factors in anorexia nervosa over three generations. *International Journal of Eating Disorders*, *48*, 1–8. doi:10.1002/eat.22293
- Steinhausen, H. C., Jakobsen, H., Meyer, A., Jørgensen, P. M., & Lieb, R. (2016). Family aggregation and risk factors in phobic disorders over three-generations in a nation-wide study. *PLoS One*, *11*, e0146591. doi:10.1371/journal.pone.0146591
- Stenager, K., & Qin, P. (2008). Individual and parental psychiatric history and risk for suicide among adolescents and young adults in Denmark: A population-based study. *Social Psychiatry and Psychiatric Epidemiology*, *43*, 920–926. doi:10.1007/s00127-008-0385-2
- Stenbacka, M., & Jokinen, J. (2015). Violent and non-violent methods of attempted and completed suicide in Swedish young men: The role of early risk factors. *BMC Psychiatry*, *15*, 196. doi:10.1186/s12888-015-0570-2
- Sundquist, J., Sundquist, K., & Ji, J. (2014). Autism and attention-deficit/hyperactivity disorder among individuals with a family history of alcohol use disorders. *eLife*, *3*, e02917. doi:10.7554/eLife.02917
- Thygesen, L. C., & Ersbøll, A. K. (2014). When the entire population is the sample: Strengths and limitations in register-based epidemiology. *European Journal of Epidemiology*, *29*, 551–558. doi:10.1007/s10654-013-9873-0
- Tourangeau, R., & Yan, T. (2007). Sensitive questions in surveys. *Psychological Bulletin*, *133*, 859–883. doi:10.1037/0033-2909.133.5.859
- Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., . . . Straus, S. E. (2018). PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Annals of Internal Medicine*, *169*, 467–473. doi:10.7326/M18-0850
- United Nations Economic Commission for Europe. (2007). *Register-based statistics in the Nordic countries: Review of best practices with focus on population and social statistics*. Retrieved from <https://digitallibrary.un.org/record/609979?ln=en>
- Upmark, M., Hemmingsson, T., Romelsjö, A., Lundberg, I., & Allebeck, P. (1997). Predictors of disability pension among young men: The role of alcohol and psychosocial factors. *European Journal of Public Health*, *7*, 20–28. doi:10.1093/eurpub/7.1.20
- Upmark, M., Lundberg, I., Sadigh, J., & Bigert, C. (2001). Conditions during childhood and adolescence as explanations of social class differences in disability pension among young men. *Scandinavian Journal of Public Health*, *29*, 96–103. doi:10.1177/14034948010290020601
- Upmark, M., & Thundal, K. L. (2002). An explorative, population-based study of female disability pensioners: The role of childhood conditions and alcohol abuse/dependence. *Scandinavian Journal of Public Health*, *30*, 191–199. doi:10.1177/140349480203000305
- Vinnerljung, B., Brannstrom, L., & Hjern, A. (2015). Disability pension among adult former child welfare clients: A Swedish national cohort study. *Children and Youth Services Review*, *56*, 169–176. doi:10.1016/j.childyouth.2015.07.001
- Vinnerljung, B., Hjern, A., & Lindblad, F. (2006). Suicide attempts and severe psychiatric morbidity among former child welfare clients—A national cohort study. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *47*, 723–733. doi:10.1111/j.1469-7610.2005.01530.x
- von Borczyskowski, A., Lindblad, F., Vinnerljung, B., Reintjes, R., & Hjern, A. (2011). Familial factors and suicide: An adoption study in a Swedish

- National Cohort. *Psychological Medicine*, 41, 749–758. doi:10.1017/S0033291710001315
- Wang, C. S., & Chou, P. (1999). Risk factors for adolescent primigravida in Kaohsiung county, Taiwan. *American Journal of Preventive Medicine*, 17, 43–47. doi:10.1016/S0749-3797(99)00035-5
- Webb, R. T., Abel, K. M., Pickles, A. R., Appleby, L., King-Hele, S. A., & Mortensen, P. B. (2006). Mortality risk among offspring of psychiatric inpatients: A population-based follow-up to early adulthood. *American Journal of Psychiatry*, 163, 2170–2177. doi:10.1176/ajp.2006.163.12.2170
- Winqvist, S., Jokelainen, J., Luukinen, H., & Hillbom, M. (2007). Parental alcohol misuse is a powerful predictor for the risk of traumatic brain injury in childhood. *Brain Injury*, 21, 1079–1085. doi:10.1080/02699050701553221