

Are we overlooking alcohol use by younger children?

Vilde Skylstad ¹, Juliet Ndimwibo Babirye,² Juliet Kiguli,² Ane-Marthe Solheim Skar,^{3,4} Melf-Jakob Kühl,¹ Joyce Sserunjogi Nalugya,^{5,6} Ingunn Marie Stadskleiv Engebretsen ¹

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¹Centre for International Health, Department of Global Public Health and Primary Care, Faculty of Medicine, University of Bergen, Bergen, Norway

²School of Public Health, Makerere University College of Health Sciences, Kampala, Uganda

³Global Health Cluster, Norwegian Institute of Public Health, Oslo, Norway

⁴Section for Implementation and Treatment Research, Norwegian Center for Violence and Traumatic Stress Studies, Oslo, Norway

⁵Department of Psychiatry, School of Medicine, Makerere University College of Health Sciences, Kampala, Uganda

⁶Department of Psychiatry, Ministry of Health, Mulago National Referral Hospital, Kampala, Uganda

Correspondence to
Dr Vilde Skylstad; Vilde.skylstad@uib.no

ABSTRACT

Alcohol use is a leading contributor to the burden of disease among youth. Early-onset use is associated with later life dependency, ill health and poor social functioning. Yet, research on and treatment opportunities for alcohol use among younger children are scarce. Despite knowledge that alcohol intake occurs in childhood, and the fact that children understand alcohol related norms and develop alcohol expectancies from age 4, younger children are rarely included in studies on alcohol use. Patterns of early alcohol use vary greatly across the globe and are part of complex interplays between sociocultural, economic and health-related factors. Family influence has proven important, but genetic factors do not seem to play a crucial role at this age. Stressful circumstances, including mental health problems and sociocultural factors can entice alcohol use to cope with difficult situations. The World Health Organization has developed guidelines for effective strategies to reduce the harmful use of alcohol, including preventative and treatment interventions, but important gaps in implementation remain. An increased focus on research, policy and implementation strategies related to early alcohol use is warranted, granted its wide-ranging implications for public health and social functioning. In this summary of literature on alcohol use among younger children and adolescents, we show that younger children (aged 10 and younger) tend to be systematically overlooked. However, research, interventions and policy implementation strategies need to include younger children to mitigate the global burden of harmful alcohol use more effectively.

INTRODUCTION

Alcohol use is a leading contributor to the burden of disease among youth.¹ It is harmful for the brain throughout development,² and it contributes to the burden of a range of diseases such as infections, cancer and injuries.³ Earlier onset of use has been shown to be associated with poor longitudinal outcomes related to alcohol dependency and harmful drinking patterns in later life,^{4 5} as well as impact on social determinants such as education, violent behaviour, criminal involvement, early pregnancy and unemployment.^{3 6}

Despite its importance for public health and social functioning, it has been estimated that 90% of adult patients with past-year

Key messages

- ▶ This review summarises current knowledge on alcohol drinking by children and associated factors.
- ▶ Alcohol use occurs in childhood, but younger children, defined as ages 0–10 years, are rarely included in research.
- ▶ Patterns of early alcohol use vary internationally and the determinants are complex, including family and peer influence, mental health and sociocultural factors.
- ▶ To enhance the comparability between studies globally, we suggest establishing a consensus on definitions and methods of measurement in research on childhood alcohol drinking.
- ▶ Effective strategies to mitigate harmful use of alcohol are known, but national implementation varies globally.

substance use disorders had no access to minimal adequate treatment in high income countries.⁷ This proportion was even higher (99%) in low-income and lower middle-income countries.⁷ While we have not been able to identify a similar estimation of access to treatment for children, the The World Health Organization (WHO) Global Health Observatory repository reports on countries' treatment programmes for children and adolescents with alcohol or substance use disorders.⁸ Their overview shows that 98 of 194 participating countries reported that they had no treatment programmes for children and adolescents, 51 countries had no data for capital cities and only 45 countries had treatment centres in at least the capital city.⁸

It has been shown that children from around age 4 years understand what alcohol is and the social norms related to its use.⁹ We also know that children's self-reports on alcohol use are valid.¹⁰ Despite this, studies on early alcohol use largely focus on adolescents.¹⁰ While adolescence is an important developmental period characterised by a rapid increase of substance experimentation and use,¹ we know that alcohol use by

**Table 1** Age definitions of childhood categories

Child(ren), childhood	0–18 years
Younger child(ren)	0–10 years
Adolescent(s)	10–18 years

younger children occurs, is under-researched and its impact is detrimental. In this review, we will present a summary of the current knowledge relating to the epidemiology and determinants of childhood alcohol use, as well as gaps and opportunities in intervention and policy implementation.

SCOPE AND DEFINITIONS

The scope of this review was to present a summary of selected relevant literature that we have encountered through our work on childhood alcohol use in the last decade. We did not apply systematic review methods, nor was the review intended to be exhaustive, but it summarises important findings related to alcohol use and its consequences in a neglected age group and raises important questions for further research. We focused on childhood use of alcohol and have therefore not included prenatal exposure or unintentional intake. Ages and stages of childhood include a myriad of definitions, with inconsistent age ranges divided into infancy, early, middle, and late childhood, preteens, adolescence and youth. In this review, we have adhered to the definitions applied by the WHO-UNICEF-Lancet commission 'A future for the world's children?',¹¹ where 'children' were defined to be 0–18 years, and 'adolescents' were defined to be 10–18 years. We applied the term 'younger children' to those aged 0–10 years (see [table 1](#)). However, we acknowledge that different studies use varying and overlapping age categories that may not fit these definitions. Similarly, there is no consistent cut-off for 'early initiation' or 'early use' of alcohol. Therefore, we have not applied a definition for what is considered 'early' but adhered to what was used by the respective studies.

THE EPIDEMIOLOGY OF CHILDHOOD ALCOHOL USE

Worldwide, there are large recurring cross-sectional studies in school-going children that monitor the prevalence of alcohol and substance use, time trends and associated factors among adolescents. These include the Global School-Based Student Health Survey (GSHS),¹² Health Behaviour in School-Aged Children (HBSC),¹³ and others. These large surveys are important, but the inconsistency in definitions and reporting of questions used to measure alcohol use complicates comparisons of the prevalence estimates they yield. The GSHS has defined a drink to be 'a drink other than a few sips'¹² and the HBSC has defined it as 'more than a small amount',¹³ without further specification. In some studies, children were asked whether they have had a drink or not without

specifying a cut-off,¹⁴ and others have focused specifically on the sips and tastes of alcohol.¹⁵ Moreover, the recall time frame varies between weekly, monthly, yearly and lifetime use. The inconsistent use of definitions hampers the comparability of studies, and the opportunity for undertaking meaningful systematic reviews. While some systematic reviews have investigated the epidemiology among specific subgroups, such as street-connected children,¹⁶ comparing youth within and outside foster care¹⁷ and migrant adolescents in Europe compared with native peers,¹⁸ a consistent challenge has been the heterogeneity imposed by inconsistent definitions and measurements, making it difficult to execute and interpret meta-analyses. To improve comparability between studies, a consensus is needed for terminologies and measurements of alcohol use. To achieve this, one can explore existing tools, such as the publicly available GSHS questionnaire,¹² or the shorter Car-Relax-Alone-Forget-Family and Friends-Trouble (CRAFFT) screening tool,¹⁹ as well as their relevance and validity across different contexts and age-groups.

In addition to the noted epidemiological challenges, there is a need for age-specific clinical screening methods and cut-offs. Donovan and colleagues have been important contributors to research on alcohol use involving younger children, termed 'really underage drinkers', aged 12 and below.^{10 15} As a response to a lack of age-appropriate definitions and screening instruments for children, Donovan used estimated blood alcohol concentration to suggest age-specific and gender-specific cut-offs for 'binge drinking': ≥ 3 drinks for 9–13 years old boys, ≥ 4 for 14–15 years old boys, ≥ 5 for 16–17 years old boys and ≥ 3 for 9–17 years old girls.²⁰ Such attempts at establishing clinically meaningful cut-offs are welcome, and more research is needed to inform valid screening methods and establish thresholds for levels of concern for younger children, although any alcohol use in this age can be argued to be of concern.

Alcohol use by adolescents

Patterns of adolescent alcohol use vary across the globe. GSHS data from 68 low- and middle-income countries (LMICs) has showed that alcohol use in the past month among 12–15 years old ranged from 0.4% of girls in Tajikistan to 59.7% of boys in the Seychelles.²¹ HBSC data has showed a declining trend for weekly intake by 15-years old in most countries in Europe between 2002 and 2014.²² The earliest recall possible for age of initiation in these surveys was '7 years old or younger' in the GSHS and '11 years old or less' in the HBSC, but we have been unable to identify reports of 'early onset' that include a lower cut-off than 10–11 years (GSHS) or 13 years (HBSC). Although most European countries have observed a decline in early initiation, an average of 28% of youth initiated alcohol intake before age 13 in 2014.²² GSHS data have showed that in 45 LMIC, 4.1%–43.5% of youth started their intake of alcohol before age 10 or 11.²³

Table 2 Findings from a selection of studies on alcohol use among children

Country	Context/population	Age in years	Definition of intake and cut-off	Prevalence, rounded to the closest whole number
Uganda ²⁴	Children with a high score (≥ 14) on the Strengths and Difficulties Questionnaire	5–8	Alcohol dependence and abuse according to The Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition criteria	8%
Argentina ²⁵	Elementary school children	8–12	Alcohol taste and repeated drinking (no distinction between taste and whole drink)	Taste: 66% at 8 years, 47% at 9 years, 82% at 12 years Repeated drinking: 28% at 8 years, 23% at 9 years, 55% at 12 years
Vietnam, ¹⁴ also includes data from Indonesia, the Philippines, and Thailand	Non-migrant vs migrant households where one or both parents were transnational migrants	9–11	Alcohol, 'Have you ever had a drink of beer, wine, or liquor—not just a sip or a taste of someone else's drink— more than two or three times in your life?'	Indonesia: 0.2% Philippines: 6% Thailand: 4% Vietnam: 17% (21% at 9 years, 14% at 10 years 15% at 11 years)
Vietnam ²⁷	Population survey, urban, rural, mountain	10–19	Alcohol intake, cut-off was not specified	6% at age 10–11 11% at 12–13 11% at 14–15 28% at 16–17 30% at 18–19
USA ¹⁵	Random sampling of child–parent dyads for a longitudinal study	8–10	If they ever had a sip or a taste of beer, wine or liquor and if they ever had a drink of alcohol (not just a sip or a taste of someone else's drink) in their life.	Sips/tastes only: 35% at 8 years 48% at 10 years A drink of alcohol: 5% at 8 years 7% at 10 years
Peru ²⁸	Rural	5–12	Parent report of child consumption of the local alcoholic brews Chicha de Jora and Clarito, made from fermented maize. The cut-off for amount was not specified.	61% Chicha de Jora 31% Clarito
England ²⁶	Birth cohort	10	Child report of alcohol use past 6 months, binary yes/no assessment, no specified cut-off.	1% of girls 3% of boys (Before and after imputation)
Resource-constrained settings ¹⁶	Systematic review of substance use (including alcohol) among street-connected children	0–24	Pooled prevalence of alcohol use from 29 of the included studies. Quantity and frequency of intake were not specified, but the systematic review included studies on lifetime use and current use, defined as intake within the past 30 days.	Pooled prevalence of alcohol use: 41%

Alcohol use by younger children

While the information on adolescent alcohol use and the age of initiation from these surveys are important, we lack reports on current use by younger children. Recall in later adolescence is problematic, as 'forward telescoping', i.e., reporting something as more recent than it actually was, has resulted in older children consistently reporting a higher age of initiation compared to when being asked at an earlier age, potentially masking an actual earlier age of onset.⁶ While data is scarce, some reports of current use among younger children do exist, and examples include 5–8-year-olds in Uganda,²⁴ 8-year-olds in Argentina,²⁵ 10-year-olds in England,²⁶ 9–11-year-olds in Vietnam,^{14 27} elementary school students in the USA,¹⁵ and rural 5–12-year-olds in Peru.²⁸ Street-connected children have been the focus in multiple studies of substance use, since this population live under exceptional conditions where substance use is rampant.¹⁶ Table 2 presents prevalence estimates from a selection of studies that have

reported on the use of alcohol by younger children and describes variations in context and measurement techniques between the studies.

DETERMINANTS OF EARLY ALCOHOL USE

Initiation of alcohol use is a complex process with multiple determinants that vary over time and by geographical location. A full exploration of these factors and their interplay is beyond the scope of this paper, but identified key determinants include family environment, genetic factors, mental stressors, sociocultural factors and policy. These often occur in combination. A summary of the determinants of early alcohol use discussed in this review can be found in table 3.

Family influence is an important determinant for early alcohol initiation, especially by younger children.²⁹ A systematic review of longitudinal studies found a consistent positive association between parental and child

Table 3 Summary of determinants of early alcohol use

Family and parents	<ul style="list-style-type: none"> ▶ Parent and child drinking are associated, but mechanisms and pathways are complex. ▶ Genetic factors are less important in childhood than in later life. ▶ Social learning contributes to childhood drinking, where parental intake models acceptable behaviour for their children. ▶ Access to alcohol in the home and parental permissiveness of alcohol use are factors associated with higher intake and frequency of drinking by children. ▶ Parental alcohol use is also associated with increased exposure to mental stressors for children, which in turn is associated with alcohol intake.
Mental health and stressors	<ul style="list-style-type: none"> ▶ Alcohol use is positively associated with mental illness, including depression, conduct disorders and suicidality, as well as mental stressors, such as neglect and post-traumatic stress. ▶ The pattern is inconsistent among subgroups of vulnerable children that experience mental stress. <ul style="list-style-type: none"> – Youth in foster care initiated earlier and had a higher lifetime use, but past year use was comparable with that of their peers outside foster care. – Migrant adolescents in Europe reported lower use, despite hardships related to socioeconomic status and exposure to discrimination.
Wider environmental aspects	<ul style="list-style-type: none"> ▶ Context matters, and wider environmental factors related to cultural norms influence alcohol use in societies, including the use by children. ▶ Within-country differences, such as urban and rural residence, are observed in certain contexts. This pattern is not necessarily consistent between countries but demonstrates an example of how local norms influence family practices and child exposure to alcohol. ▶ Peer norms and positive social markers of alcohol use further prompt initiation to 'fit in'. Social media and other media platforms contribute to these positive social associations with alcohol use and accentuate norm generation.

drinking, but concluded that causal inferences could not yet be established.³⁰ While genetics can play a role, the variance in drinking initiation and drinking patterns attributable to genetic factors has been found consistently lower in childhood and early adolescence, and increasing into adulthood.³¹ Social pathways have shown more promising results in explaining the link between parental and child drinking, and important concerns have been raised related to the increased exposure to parental drinking during the Covid-19 pandemic, where parents and children have spent more time at home.³² The link is sometimes indirect, through mechanisms of social learning, but also direct, by provision of alcohol in a family setting. One study investigating GSHS data from 45 LMIC found that familial alcohol supply was associated with earlier onset of alcohol intake and a higher frequency of drinking.²³ Furthermore, a 2011 Australian secondary school survey found that 33% of last-week-drinkers received their latest drink from their parents and 23% from friends; only 10% took the alcohol from home or purchased it themselves.³³ Studies have shown that parents' own alcohol use is associated with early childhood drinking as well as an increased chance of experiencing negative alcohol-related consequences. A study on 7000 European pupils aged 12–14 years, found a strong relationship between parents' permissiveness and adolescent alcohol use.³⁴ Perceived parent approval of sipping, parental drinking status and frequency, and child attitude toward sipping was associated with sipping alcohol by 8–10-year-olds in the USA.³⁵ In a birth-cohort from England, almost 7000 children were followed up at age 10, finding that maternal drinking in early childhood was the most important influence on child alcohol-use in the past 6 months, while paternal drinking was

associated with a lower risk for child drinking (possibly due to residual confounding).²⁶ A study from Burkina Faso, Ghana, Uganda and Malawi found a relationship between living with someone before age 10 who had an alcohol use disorder and self-reported drunkenness in adolescence.³⁶ Adding to the influence of learning from a family member that drinks, one also has to keep in mind that parental drinking is related to less family support, reduced parental monitoring and increased risk of experiencing mental stressors, such as domestic violence³ and neglect.^{17 37}

Harmful alcohol use is closely related to mental stressors and disorders,³ including in younger age groups. This can be related to coping with hardship, or part of a symptom picture, with for example reduced impulse control or conduct issues. In the aforementioned English birth cohort, drinking at age 10 had a weaker association with conduct problems compared with depression, but the relationship was stronger in adjusted analysis.²⁶ In a small study from Uganda (n=148), 10 out of the 11 children aged 5–8 years diagnosed with harmful alcohol use and dependence had psychiatric comorbidities, including conduct disorder, suicidality, panic disorder and depression.²⁴ In a study from the USA, investigating suicidal ideation among more than a thousand 8-year-olds at risk for or victims of maltreatment, 21% had used substances, including alcohol. Further, children that used substances were four times more likely to report suicidal ideation, and this association was stronger among maltreated children.³⁸ However, some studies that have compared community samples with subgroups that are vulnerable for mental stressors show inconsistent results. One example is a systematic review that compared non-foster care youth and current and former foster care

youth aged 12 years and older.¹⁷ While experiences of mental stressors, including neglect and post-traumatic stress disorder, were among the identified predictors of use, also among foster youth, the effect of being in foster care was not uniform. Overall, foster care youth initiated alcohol use earlier, and had higher lifetime use, but past year use was comparable between foster care youth and non-foster care peers, where youth outside foster care sometimes reported higher intake.¹⁷ Moreover, among migrant adolescents aged 11–29 years in Europe, a systematic review found consistently lower rates of substance use among migrants compared with native European peers. This was explained by cultural factors and religious beliefs, as well as the ‘migration paradox’, where recent immigrants tend to do better than their native peers in health, education and other outcomes, despite poorer socioeconomic conditions, exposure to discrimination and other stressors.¹⁸ This demonstrates how patterns of substance use and risk factors, even in younger age groups, are complex and multifaceted.

In addition to individual-level explanatory factors, we must take into consideration environmental and anthropological aspects. In some contexts, traditional forms of home brewing has made alcoholic brews affordable and available also to young children.^{28 37} Family location has been reported to be part of the social environments that influence alcohol consumption among adolescents. One study compared adolescents aged 12–17 years from urban and rural areas in Australia, finding that adolescents from rural areas were at higher odds of receiving their first alcohol from parents, receiving their current alcohol of use from parents, and drinking at home.³⁹ Additionally, children from rural areas were more likely to engage in harmful drinking patterns, with heavy drinking and weekly drinking, and their parents were also more likely to have harmful drinking patterns.³⁹ This does not mean that rural residence always predicts more harmful drinking patterns, but that where you live matters, and drinking patterns vary between and within countries depending on sociocultural and economic factors. Further, cultural norms, social influences from peers and social media intersect to create an environment around alcohol use during mid-adolescence and the early years, driving consumption at this stage. A qualitative exploration of sociocultural influences of adolescent alcohol use found that alcohol consumption was associated with being cool, mature and popular, while enabling escape from reality and boosting confidence and enjoyment.⁴⁰ Positive expectancies, alongside opportunity, contributed to motivating initiation, but social influences were paramount, with participants describing a need to ‘fit in’ with friends to avoid social exclusion. Such influences positioned drinking at parties as a normative social practice, providing opportunities for social learning and the strengthening of peer norms. Social media presented young people with positive alcohol-associated depictions of social status, enjoyment and maturity. This intersection of influences and norms generated a pressurised

environment and a sense of unease around resisting pressures, which could elicit stigmatising insults.⁴⁰

INTERVENTIONS, POLICY GAPS AND OPPORTUNITIES

Interventions for childhood alcohol use can target different stages of drinking, namely: (1) initiation of alcohol use, (2) problematic drinking and (3) chronic or clinical alcohol use disorders. A large proportion of the research on interventions for harmful alcohol use among adults focus on clinical alcohol use disorders, requiring treatment and rehabilitation within health facilities. However, the complexity of childhood alcohol use demands multidisciplinary interventions, and it is imperative to provide systemic interventions to prevent alcohol use at the primary level, i.e., the initiation stage. To encompass the needed focus on parenting, social support, coping skills, and emotional functioning family-based and school-based intervention and prevention programmes have proven promising.⁴¹ In an overview of systematic reviews on interventions for adolescent substance use, eight systematic reviews on alcohol use were included.⁴¹ While the findings from the interventions had mixed results, they showed that school-based interventions and prevention efforts were overall associated with a reduction of alcohol consumption. Family-based interventions, focusing on parenting and nurturing behaviours, had small but long-lasting effects.⁴¹ While these studies focused mostly on older adolescents, positive results have been found regarding the feasibility and acceptability of a programme for screening, brief intervention, and referral to treatment of substance use among youth in a school-setting as early as in sixth grade.⁴² In settings where access to treatment for alcohol use disorders is scarce, innovative interventions are needed. One example is mobile facilities for inpatient treatment and psychoeducation for adults which have shown promising results in Uganda, demonstrating the need for accessible treatment options close to the community.⁴³ Age-appropriate and context-appropriate interventions for preventive and treatment purposes for younger ages are needed, both integrated within child mental health services and within children’s contexts. Rigorous research that identifies effective interventions and their implementation strategies is necessary to enable governments to counter early childhood alcohol use.

Beyond the immediate environment of family and school, prevention of access to alcohol by children needs attention on a wider societal level. While narcotic substances are illegal in most countries, political priority and regulations are necessary to protect children from the harm related to the alcohol available to them in communities. The WHO has defined the most cost-effective strategies to prevent harmful alcohol use across country income levels, termed ‘best buys’³ (see table 4). These include regulating alcohol availability by implementing and enforcing a minimum legal drinking age and restricting hours, days and places of sale, restricting and enforcing bans on alcohol marketing, and regulating

**Table 4** Opportunities for interventions and public policy to address alcohol use by children

Interventions	<ul style="list-style-type: none"> ▶ Multidisciplinary interventions are needed across the continuum of childhood alcohol drinking, spanning initiation of use, problematic use, and clinical alcohol use disorder. ▶ Family-based and school-based interventions are needed to encompass the complex and contextual determinants of childhood alcohol use, including parenting, social support and coping skills. ▶ Innovative alternatives need to be developed for resource-constrained settings, where access to treatment is limited.
Policies	<ul style="list-style-type: none"> ▶ The WHO's 'best buys' provide guidance on the most cost-effective policies and strategies to prevent harmful alcohol use³: <ul style="list-style-type: none"> – Regulate the availability of alcohol, including defining and enforcing a minimum legal drinking age and enforce bans on selling alcohol in schools and at events that attract children. – Restrict and enforce bans on marketing of products that contain alcohol, including on social media and internet-based advertising. – Increase taxes on alcohol and regulate prices.

prices and taxes.³ Among countries reporting to the 2018 WHO Global Status Report on Alcohol and Health, 93% had implemented a minimum age for on-premises alcohol purchase, where 18 years was the most common, while some reported limits as low as 13, 14 and 15 years, and some LMICs had no formal age limit.³ Regulation of days for sales and alcohol outlet density, however, was reported by less than a third of reporting countries. Relevant targeted restrictions on public drinking included a total ban on intake in educational buildings (60%) and sporting events (30%).³ Children and youth are especially sensitive to marketing, and the need to regulate commercial marketing of harmful products to children has been emphasised in the WHO-UNICEF-Lancet commission 'A future for the world's children?', where social media and the internet were considered increasingly important platforms.¹¹ Yet, social media and internet regulations were the least common form of market and advertising regulation in the 2018 WHO Global Status Report on Alcohol and Health, and LMICs were most commonly reporting to have no restrictions across media platforms.³ Overall, the report revealed large disparities across the globe relating to the political priority and the available resources for implementing effective measures to prevent early alcohol exposure. Table 4 summarises key opportunities and characteristics of needed interventions, as well as established recommendations for relevant public health policy.

CONCLUSION

Childhood alcohol use is an important global public health issue with implications for social, economic and health consequences throughout the life course. Research on early alcohol use mainly focuses on and includes adolescents, while research on the use by younger children is often limited to recall of age of initiation. This potentially misses the correct initiation time and overlooks the current use by younger children—despite their valid self-reports and understanding of alcohol expectancies and norms. The prevalence estimates vary globally and methods for assessments are not uniform. To enhance comparability of study results there is a need to establish

a consensus on how alcohol use should be defined and measured within and across age groups.

Childhood alcohol use happens in a complex interplay with factors related to the family situation, mental health stressors and the wider environmental contexts and norms. However complex and multifaceted, there are clear international guidelines for preventing and managing harmful use of alcohol, also by children. Political priority and resources need to be allocated towards implementing and enforcing minimum age limits and regulating access to alcohol and exposure to marketing. Treatment alternatives need to be improved and scaled up, and research needs to include younger age groups. Alcohol use is among the leading contributors to the burden of disease among youth and deserves proportionate attention. Overlooking early childhood drinking in research, interventions, and policy implementation strategies hampers effective mitigation of the global burden of harmful alcohol use.

Twitter Ingunn Marie Stadskleiv Engebretsen @ingunnengebret1

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ORCID iDs

Vilde Skylstad <http://orcid.org/0000-0002-2811-6457>Ingunn Marie Stadskleiv Engebretsen <http://orcid.org/0000-0001-5852-3611>

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