

Amity

Community Services Inc



Alcohol and the Territory

Amity's contribution to the Northern Territory Government's Alcohol Policies and Legislation Review

July 2017

“No matter what time of the day or night ... one can find, in and around some of the hotels of Darwin, idlers sitting about, or bar loungers and beer ‘chasers’ quaffing the ‘cup that cheers’, ‘spitting and blaspheming’. ... Darwin hotels are the scenes of orgies that would bring despair to the heart of the bravest temperance reformer. .. I have stood by and heard the maniacal howls of drink distempered men, men in physique only - in all else beasts - yelling curses and imprecations in a babel of tongues. In fact it is a common Darwin cosmopolitan scene.” Extract from Hansard, Thursday, 15 March 1917

Even in the midst of World War 1 problematic alcohol consumption in the Northern Territory was exercising the minds of Politicians.

About Amity and why we view alcohol and harms the way we do

Amity Community Services Inc (Amity) is a Northern Territory community organisation that has been providing alcohol, other drug, gambling and associated mental health services since 1976. Amity has worked with thousands of Territorians to address difficulties experienced in relation to alcohol, other drugs, gambling and associated mental health issues. While we acknowledge the social, tourism and economic benefits associated with the hospitality industry we also note the harms and costs to individuals, the community and businesses arising from problematic alcohol use.

Amity has come to view alcohol problems in three broad groups with overlaps of each group (Thorely's Model of Use). The first group of alcohol issues can be viewed as problems of intoxication. Problems with intoxication can be experienced from any drinking episode and can also flow from regular and dependent alcohol drinking patterns. Problems experienced with intoxication include trips, slips and falls, domestic and family violence, assaults, alcohol related vehicle crashes, road trauma, work injuries and absenteeism.

The second group of alcohol issues come from regular drinking. This pattern of alcohol consumption can be described as daily drinking or any regular pattern of consumption. For example patterns such as every Thursday, Friday, Saturday and Sunday nights, or consuming large amounts in sessions during fly-in fly-out breaks. The issues experienced with regular alcohol consumption can be longer-term health issues such as alcohol related brain damage, fatty liver/cirrhosis, increased risk of heart disease and cancers, relationship concerns and breakdown, spending more time and money to the detriment of work, children, family and community engagement.

The list of harms related to ongoing regular drinking is extensive and well evidenced in the medical literature. The third group of alcohol harm comes from alcohol consumption by people who are experiencing problems with dependence. Dependence is where people experience discomfort because of withdrawal. People often do not know how dependent they are upon alcohol until they take a break from drinking. For people the dependence on alcohol can be psychological, a way to relax and cope with daily stressors in our modern lives. People with dependency issues can still experience problems with intoxication, regular use as well as the gamut of longer-term health, relationship, employment and social issues.

Amity's practice evidence in the last year shows us that 48% of people accessing our counselling service do so for alcohol related issues with 77% of that group identifying as non-Indigenous people.

The cost of alcohol harm has been estimated in the Northern Territory to be \$4197 per adult in comparison to the rest of Australia at \$943 per adult (South Australian Centre for Economic Studies & Menzies School of Health Research, 2009). Clearly there needs to be a way of increasing revenue to cover these costs which are being taken from other areas of health and government and resulting in missed opportunities for Territorians. For example, you cannot invest in tourism infrastructure if hospital costs continue to increase with the demand on resources to respond to alcohol related violence, trauma and harms.

No single approach will address all areas of alcohol harm. The focus cannot solely be upon supply control. A suite of treatment responses will be required to reduce various harms experienced by people, families and our broader community.

Long-term demand reduction campaigns and initiatives underpinned by harm reduction and guided by ethical frameworks need to be established, resourced adequately and at arm's length from political and industry short term agendas or interference. As an indication of the need for long-term commitment and resources to address public health issues, outcomes in addressing tobacco use in Australia can be used as an example. In 1945, 72% of adult males smoked and by 2014-15 only 16.9% of males smoked - a seventy-year effort. Sustained cultural change takes time, commitment, evidence and resources.

Amity espouses a public health view to alcohol harm reduction in the Northern Territory.

Public Health

Public health is the science and art of prevention and of promoting health through the organised efforts and informed choices of society, public and private organisations, communities and people. Public health is a term applied across broad areas of health of diverse populations. Public health is viewed as the science and art of protecting and improving the health of communities through the promotion of healthy habits and lifestyles.

Empirical and practice evidence shows us that problematic alcohol use can no longer be solely explained as an individual problem. UNESCO (1993) argued that alcohol and other drug abuse is one of the indicators of the degree of social wellbeing of a society. Therefore, the recommendations for supply and demand initiatives to address excessive alcohol consumption by our community need to be broadly focused on whole of community rather than only on individuals.

The Harm Minimisation Approach

Harm minimisation acknowledges that people will engage in substance use regardless of the legality status. The framework is built on the three pillars of harm minimisation - demand, harm and supply reduction. Each pillar is equally important to the success of the overarching strategy. Prevention is an integral component across all three pillars. The National Drug Strategy provides a framework for action to work to minimise harms for individuals, families and the wider community from tobacco, alcohol and other drug use.

Harm reduction recognises the realities of poverty, class, racism, social isolation, trauma, gender based discrimination and other social inequalities which affect both people's vulnerability to and capacity for effectively dealing with alcohol related harm (Wodak, 2011).

Amity acknowledges the devastating effects that alcohol use can have for individuals, families, friends and our community. We advocate for alcohol issues to be viewed as both a health issue and as a result of bio-psycho-social factors.

There is overwhelming evidence on what will work to change consumption and thus harms experienced by people, families and community. Amity views alcohol and other drug issues as

primarily a health issue rather than an exclusive criminal justice approach and advocates for responses that are solidly founded in evidence that focus on health outcomes.

Amity supports and advocates for a comprehensive plan to address alcohol in the Territory with prevention as an integral component across all three pillars of harm minimisation.

Demand/ Culture

Demand reduction is more than reducing people's desire to engage with alcohol at harmful levels. At the core of demand reduction it is about changing the social and cultural norms currently embedded in long-held views of social experiences of alcohol.

Political, Structural, and Social Determinants of Health

Health inequality results from the activities of actors with different interests and degrees of power in the policy arena. Hawkins and Cambridge (2013) argued "corporate actors seek to influence alcohol policies through various means, including attempts to shape the evidential content of policy debate" (p. 1363). It may be touted that actions of vested interests are not designed to harm health of people and communities but for a long time the actions and policies regarding alcohol in the Territory have had negative impacts felt by individuals, families and our broader community.

The norms, policies and practices that arise from political interaction across all sectors are the political determinants of health. McCambridge and colleagues (2014) discuss alcohol harm and corporate concepts in their research and found that the alcohol industry has an ability to shape alcohol policy nationally and globally and this needs to be "curtailed because of a fundamental conflict of interest with reducing alcohol harms". This research also found that the alcohol industry are likely to lobby against evidence-based whole-population measures that public health has found to be useful in reducing harms from alcohol.

Miller and colleagues (2011) in their article in *Addiction – Vested Interest Series* - suggest that industry led social initiatives are employed to "create an impression of corporate social responsibility while promoting interventions that maintain profits and campaigning against effective interventions such as higher taxes on alcohol" (p. 1560). The Global Strategy to reduce the harmful use of alcohol argues that public policies and interventions to prevent and reduce alcohol-related harm should be guided and formulated by public health interests and based on clear public health goals and the best available evidence (World Health Organisation). Further arguing that all involved parties have the responsibility to act in ways that do not undermine the implementation of public policies and interventions to prevent and reduce harmful use of alcohol. Donovan from Curtin University has argued that having alcohol industry on advisory boards and such is a conflict of interest and in breach of the WHO standards.

Amity recommends the purpose of alcohol policy should be to reduce harms for people, families and communities from alcohol while to a lesser extent acknowledge tourism, economics and recreational drivers of alcohol.

Amity recommends that submissions and information from industry be carefully scrutinised against empirical evidence and used only to inform decision-making not as a driver of policy formation.

Further to this Amity recommends that political donations from industry bodies should be publically scrutinised to ensure there are transparent processes in place regarding donations and influence of vested interests into the policy arena of highly politicised debates.

Racism and discrimination are considered to be part of the structural determinants of health. The Joint United Nations statement on ending discrimination in health care settings puts forward practical ways to ensure we are working to remove discrimination in health services by removing: involuntary treatment, breaches of confidentiality and/or denial of autonomous decision-making; reviewing and repealing punitive laws that have shown to have negative public health outcomes and are counter to public health evidence and reviewing, strengthening and monitoring health professional policies, regulations, standards, working conditions and ethics.

Amity recommends that alcohol policy and legislation be non-discriminatory and be sensitive to issues surrounding race, ethnicity, culture, world-view, disability, age and gender diversity.

There is good evidence for the engagement and completion of general schooling and education. This has shown to increase opportunities and employment prospects which impacts on the social determinants of health in the long-term. There is limited support for alcohol and drug education in the classroom and some research in this area has shown that there is no long-term effect on consumption (Babor et al., 2010).

The Territory does not stand alone in our experiences of alcohol and drug issues. There is a plethora of local, national and international evidence on what will work. For example we draw attention to the Icelandic Experience – Iceland today tops the European table for the cleanest-living teenagers. The percentage of 15 and 16 year olds who had been drunk in the past month dropped from a massive 42% to just 5 per cent from 1998 – 2016. For cannabis use it was down from 17% to just 7% and young people smoking cigarettes every day fell from 23% to just 3% in the same period of time. Harvey Milkman, an American Psychology Professor, argues “clearly the Icelandic model could benefit the general psychological and physical wellbeing of millions of children not to mention the coffers of healthcare and broader society” (see attached paper).

The Icelandic model is evidence that investment into long-term prevention models can work to change behaviour and cultural norms. It is broader than isolated diversionary activities and programs and is underpinned by social inclusion and resilience building through sports, music, education, art, traditional culture and meaningful engagement.

There is a well-known study in psychology – Rat Park – that hypothesised that drugs do not cause addiction rather the environment and living conditions are what underpin addiction. Further studies have uncovered various findings, however essentially it is commonly accepted that alcohol and other drug use is viewed through a bio-psycho-social lens.

Therefore Amity recommends a community development approach focusing on housing, education, community safety, policing, economic participation and employment to build community resilience to address the social determinants of health and be undertaken by whole of

government and be inter-sectoral similar to the Living with Alcohol Program and the Icelandic Model.

Demand reduction at its core is about prevention. Preventing the uptake of harmful consumption. Health information, marketing messaging, mass media campaigns and warning labels alone do not have good evidence for changing behaviour. There is evidence that social marketing supports the acceptance of public health initiatives such as Random Breath Testing and the Slip Slop Slap campaigns. Advertising does work to increase awareness and in sales and marketing there are clear links to advertising increasing consumption and changing behaviour.

There is some evidence that employing social marketing principles may contribute to changing community's culture of the acceptability of drinking as a social norm (Babor et al., 2010). For example, engaging with these principles have been found to produce effective communication strategies to inform the public of the costs to health, productivity, relationships and the legal system of harmful products and behaviours. Raising awareness of the magnitude of public health problems caused by harmful use of alcohol requires consistency, scientific soundness and clarity of key messages about preventing and reducing harmful consumption (Babor et al., 2010).

Amity recommends awareness-raising campaigns to support demand reduction initiatives. They need to be founded in good evidence and guided by an ethical framework to reduce shame and stigma associated with alcohol harms. Campaigns and interventions need to be developed, disseminated and independently evaluated on their purpose to support alcohol use culture change.

Harm / Care

While the Territory has certain commonalities with other jurisdictions it also has significant differences. Approaches to service delivery, community input and community control of these services needs to be culturally and linguistically competent and consistent with the needs of the population services are engaging with. These services also need to meet best practice and sector standards in alcohol and other drug quality service provision for people, family, friends and the community.

Alcohol and drug use is commonly associated with trauma and other mental health conditions including depression, anxiety, post-traumatic stress and loss and grief. In addition to these issues and concerns there is a need for services to be available for people experiencing or at risk of alcohol related brain damage and Foetal Alcohol Spectrum Disorder.

Therefore availability and access to evidence based, non-judgemental and non-coercive practices in harm reduction are required in prevention, early intervention and through the continuum of care. This continuum can be through community information and education, brief interventions by primary health professionals including general practitioners, counselling, residential rehabilitation, withdrawal and emergency care and shelter for intoxicated people.

Amity's recommendation for harm reduction is to provide services on a continuum of care to address alcohol issues across the Territory.

Amity recommends that current practices and services in alcohol and other drugs sector are evaluated for meaningful outcomes. And people working in the sector have access to ongoing workforce development.

Amity recommends that any new and innovative approaches or pilot projects are well designed, resources and independently evaluated.

Previously the Territory had court diversion programs, most recently, from 2011, the Substance Misuse Assessment and Referral for Treatment Court (SMART Court). This specialist court was able to hear criminal matters in the Magistrate or Youth Justice Court in the Northern Territory where offenders had committed an offence and a history of serious alcohol and/or other drug use. The Smart Court was able to issue bans on the consumption of alcohol and other drugs and to mandate treatment orders. Essentially the court, monitored by qualified court clinicians, becomes the case manager for people in diversionary courts. This specialist court is no longer operating and no evaluation of the program is in the public domain.

Prior to the SMART Court the Territory had alcohol and illicit drug specialist courts. These specialist courts were a court diversion program targeting individuals whose offences were alcohol and/or drug related. Treatment type is determined on the identified needs of the client as assessed by qualified court clinicians. Court clinicians become the case manager of the person in the diversion program.

Drug courts around the world have been evaluated and despite differences in the drug court structures, jurisdictional compositions, methods employed in evaluation, these courts have been found to be “more successful than other forms of community supervision” (p. 12) and to generally reduce recidivism while offenders are in the program (National Drug Court Review, 2008)

In a report on drug courts in Texas, Martinez and Eisenberg (2002) discuss the goals of drug courts are to provide court-supervised treatment to reduce drug usage, arrests and recidivism and to lower costs in the criminal justice system. In general, research has found “lower recidivism rates for drug court participants” (p. 8) and savings in criminal justice costs.

Leven (2006) in his review of drug courts suggested being the ‘right prescription for Texas’ that instead of isolating people in prison, drug courts force people to confront their addiction and repair the damage they have done to themselves, their families and their community. He further stated “drug courts are not soft on crime” (p. 3) and they are “the right prescription for Texas” (p. 3).

The National Drug and Alcohol Research Centre (2008) suggest that best practice principles of diversion need to include a broad range of diversion programs with different levels of interventions and access for all offenders. Mitchell (2012) suggested that there were better and cheaper ways of reducing drug-related offending than prison. In the research of drug courts’ effect on criminal offending for adults and juveniles it was found that court programs that work to reduce drug related offending through rehabilitation with supervised drug treatment programs and support services have been shown to be cost effective ways of reducing re-offending. An independent evaluation of the NSW Drug Court Completion Program found participants to be 37% less likely to be reconvicted during the follow-up period.

Amity supports the reinvestment into evidence-informed specialist alcohol and other drug courts for the Territory.

Supply / Control

Risk-based licensing and licensing fees according to risk

Both internationally and nationally there are examples of risk-based licensing approaches and fees for harmful products. The Alcohol and Gaming Commission of Ontario, for example, employs a risk-based approach when regulating liquor sales. They argue that this allows for the alcohol and gaming commission to encourage good business practices throughout industry and to strategically focus regulatory resources where they will make the most difference.

Clearly there are some risks attached to the sale and service of alcohol. There is a plethora of evidence for harms and the association with particular types of establishments, their location, the past history and the skills and experience of the licensee and staff. Some establishments pose a greater risk to public safety and non-compliance with laws than others. In other Australian jurisdictions licensing commissions consider risk-based structure and fees. Venues can be charged an annual fee based on trading hours, capacity and license type. For example a small licensed restaurant or bar with no history of breaches or the generation of community issues, that trades until midnight is less risky than a venue with a higher capacity, trades until the early hours of the morning and has a history of behavioural issues that generate community concerns. These specific types of venue would be a higher risk and therefore attract higher licensing fees.

Amity recommends risk-based licensing and licensing fees according to risk.

Availability and accessibility

Trading hours that meaningfully reduce the availability to alcohol have shown to have some harm reduction effectiveness in the evidence (Babor et al., 2010).

Evidence in relation to 'lock-out' initiatives is showing, for large venues in late night entertainment precincts, that people may end up in the venues continuing to consume alcohol at high rates and therefore it is unclear how this approach reduces the availability and thereby the associated alcohol related harm. Studies have found that changes in hours of sales has impacted on acute harms but have little effect on chronic health harms such as cirrhosis. The converse is true also that increases in trading hours are related to an increase in assaults, driving impairments and road crashes and trauma (Babor et al., 2010).

Clearly there are a number of researchers and institutions that will contribute more to these components of the discussion than we can. However our practice evidence tells us that problems associated with intoxication such as the above-mentioned assaults, driving while alcohol impaired, road crashes and trauma are affected by increased availability and access to liquor.

Amity supports a review of trading hours with the aim of limiting and decreasing hours to be consistent with evidence from other jurisdictions.

Regarding the Banned Drinkers Register (BDR) Amity supports this re-introduction to assist with restricting access to persons listed as banned from purchasing alcohol. This initiative alone will not be the silver bullet to alcohol problems and harms and is only one accessibility strategy. It is an initiative with little evidence base to-date. Amity supports the ongoing monitoring and evaluation of this supply control measure, at arm's length of government to reduce further politicisation of the issue and to ensure it is effective, efficient and non-discriminatory in nature of implementation. Amity also supports BDR checks for deliveries of alcohol.

Density

There is strong empirical evidence that shows us that the number of outlets and how closely they are situated results in changes in people's consumption and the alcohol related harms they experience. It has been found that alcohol outlet density is correlated to alcohol-related assaults, child protection incidences, road crashes and drink driving and pedestrian injuries (Babor et al., 2010). Some evidence demonstrates that a gradual change in the reduction of alcohol outlet density is related to change in alcohol related violence behaviours. When the approach of decreasing density has been implemented in an attempt to reduce gaming machine numbers, the least performing machines and venues exited the industry. It has been argued that this licence move generated greater harm than the harms from the underperforming venues. A similar argument could be presented in the local context of moving a liquor licence from a small underperforming store to a large warehouse style liquor outlet that promotes lowest prices guaranteed.

Amity recommends that density be a consideration in licencing applications however not as a strategy for failing businesses to exit the market.

Floor price / volumetric pricing

One potential approach to the costs associated with harmful alcohol use is to utilise the sales of the product to contribute to the costs. Currently the costs associated with alcohol use are borne by individuals and community. For example the costs of injuries, domestic and family violence, assaults, policing and health provision is provided by the public purse and alcohol profits are privatised by producers, distributors and sellers. Imposing a tax could help contribute to the public costs of ameliorating harm from alcohol.

A volumetric tax involves taxing liquor according to the alcohol content. A standard drink would be taxed equally whether it is served as beer, wine or spirits. This type of approach can only be implemented at a Commonwealth level. There are issues with this approach when sales are not tied to volumetric tax. Currently there is great variation, for example cask and cheap bottled wine, which has a higher volume of alcohol, is taxed at approximately eight cents per standard drink while beer is taxed at more than thirty cents. The tax worked effectively in tobacco sales where the product is singular. There is no indication that this taxation regime is likely to be implemented. In the absence

of a volumetric tax a minimum floor price could be legislated and this would increase the minimum price of alcohol. It is less effective and efficient than a volumetric tax but it is one way to increase the cost of alcohol that has solid evidence worldwide for an effective strategy to reduce consumption and thus harm.

There would preferably be a link between the volume of alcohol sales and a licence cost so that funds went back to recover cost of the public burden of alcohol related harm in the absence of a tax option, because a floor price is of benefit to the retailer rather than a contribution to costs incurred.

Amity supports volumetric tax and in its absence then floor pricing with a link between volume of alcohol sales and licence costs.

Regulation enforcement / compliance

Evidence has repeatedly shown that voluntary codes are ineffective (Room, et al.,). Despite their popularity research finds that they are unlikely to impact on alcohol consumption or alcohol related harm (Barbor et al., 2010). Evaluations of codes of practice in other areas such as gambling found smaller venues struggled with the need for resources to just run the business and were less focused and committed to voluntary codes and compliance in a variety of areas. Larger venues were able to have dedicated resourced personnel addressing compliance with regulations and some focus on codes to manage reputational risk and to avoid additional mandated requirements. Staff training and house policies alone have not shown to be effective strategies in reducing excessive consumption (Babor et al., 2010).

Codes and Accords need to be backed by enforcement for sustained effects. A strong compliance schedule and oversight is critical to enhanced performance.

Amity recommends mandatory codes and a strong compliance schedule for enforcement of required activities and practices.

Social Impact Assessment or Community Needs and Wishes

Community mobilisation and community action approaches can be effective if appropriately resourced and long-term. Amity's experience from recent changes to gaming machines licences in the Northern Territory showed that Social Impact Assessments carried out as part of licence application were undertaken by lawyers or other parties funded by the licence applicant. They identified and highlighted the benefits such as wages into the community, numbers of televisions available in the venue, cost of refurbishment and appear to minimise the negative impacts that studies have shown such as increased domestic and family violence, negative impact on small business and job loss and effect on crime and financial impacts on significant others. When community groups raised objections they were not seen as appropriate parties to the application. Community group's time, finances and resources were also very limited and they appeared to struggle to get data showing immediate impact on the area in question. Information was gathered

from other jurisdiction and locations and has been deemed not relevant to the application or accorded little weight as suggested to be generic in context.

Amity recommends that if Social Impact Assessment or Community Needs and Wishes are a component of licencing applications that they are undertaken with the support of an appropriately resourced, contracted, disinterested third party such as a University with a developed methodology.

In conclusion the Territory has a long history of alcohol consumption and related harms. We experience these harms because of the amount of alcohol we consume as a community and a deeply embedded culture of drinking.

The Territory has previously shown that we can impact on alcohol harms in a positive and non-judgemental way through effective leadership, policy and collaboration, for example The Living with Alcohol Program. If we are to achieve change that is sustainable it will be from planned long-term commitment that receives broad political and community support and is appropriately resourced with the focus on harm minimisation.

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Population trends in smoking, alcohol use and primary prevention variables among adolescents in Iceland, 1997–2014

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ABSTRACT

Aims To estimate linear time-trends in substance use and primary prevention variables in adolescents in Iceland from 1997 to 2014. **Design** Repeated, cross-sectional population-based school surveys with seven waves of pooled data. **Setting:** Iceland. **Participants** All accessible students enrolled in the 9th and 10th grades in the national Icelandic school system during the spring of 1997, 2000, 2003, 2006, 2009, 2012 and 2014 ($n = 50\,412$, boys = 50%). Response rates ranged between 81 and 90% of the population. **Measurements** Measures on substance use included smoking and alcohol use. Primary prevention measures included parental monitoring, parental social involvement, participation in organized sports and reduced participation in a party life-style. **Findings** Substance use decreased consistently during the study period. For example, 30-day drunkenness declined from 29.6 in 1997 to 3.6% in 2014 (linear trend: $\chi^2_{(1)} = 2846.8$, $P < 0.001$), and daily smoking during the last 30 days declined from 17.0 to 1.6% during the same period (linear trend: $\chi^2_{(1)} = 1614.3$, $P < 0.001$). Primary prevention factors strengthened over time. For example, the mean score for parents knowing where their children are in the evenings rose from 2.44 in 1997 to 3.08 in 2014 ($F_{\text{trend}(1, 42635)} = 2538.3$, $P < 0.001$), and mean scores for participation in party life-style declined from 2.23 in 1997 to 1.71 in 2014 ($F_{\text{trend}(1, 38773)} = 2033.1$, $P < .001$). **Conclusions** Substance use among adolescents in Iceland has declined steadily from 1997 to 2014, while primary prevention factors for substance use have increased in strength during the same time-period.

Keywords Adolescents, alcohol use, Iceland, primary prevention, smoking, substance use.

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INTRODUCTION

During the 1990s national social surveys among Icelandic youth showed a steady increase in substance use among 15- and 16-year-old adolescents, reaching a high in the years 1997–99. The Youth in Iceland school survey in 1997 showed that more than 42% of 10th-grade students in Iceland reported having been drunk during the previous 30 days and 23% reported daily cigarette smoking [1,2]. The 1999 European School Survey Project on Alcohol and Other Drugs (ESPAD) confirmed the alarming status of Icelandic adolescent substance use by revealing that Iceland was the seventh highest among 21 countries in

Europe in life-time smoking and fifth in the proportion of European adolescents reporting drunkenness three times or more during the last 30 days [3].

More than 15 years later, the 2013 annual Youth in Iceland survey showed that the high rates of substance use in 1997 had declined to 5% and 3%, respectively [4]. The 2011 ESPAD survey confirmed this steep population decline in adolescent substance use in Iceland [5]. Despite the fact that several European countries have shown a considerable decline in youth substance use [6–8], the 2011 ESPAD survey showed that Iceland was the only country among the 36 countries that participated in the pan-European comparative survey that year to show a

consistent decline across all five consecutive ESPAD surveys (i.e. 1995, 1999, 2003, 2007 and 2011) in cigarette smoking ([5], p. 125, Figure 20d) and alcohol use ([5], p. 129, Figure 22d) during the last 30 days.

The question is whether and to what extent this decline in substance use among young people in Iceland is related to an 18-year-long population prevention approach among adolescents that was launched initially in Iceland in the late 1990s as a government-sponsored health promotion initiative [9]. The core idea behind this prevention approach was to strengthen a host of community protective factors, e.g. parental monitoring, parental co-communication and social involvement and adolescent participation in organized sports, and to decrease risk factors such as adolescent party life-style and unsupervised idle hours. The impact of this approach was partially evaluated in 2010 with a quasi-experimental, non-randomized control group design and stringent inclusion criteria [10]. This evaluation showed solid effects, but included only approximately 14% of the study population given the strict inclusion criteria for group division. On a broader level, however, given that the primary prevention approach in Iceland has been conducted as a long-term health promotion effort with several different components and participating organizations and not as a program in the conventional sense, a controlled evaluation of its efficacy with a defined comparison group and high internal validity is not feasible. Instead, in this study we have tested population time trends in key dependent and independent variables that have been the focus of the population prevention approach in Iceland since 1997 and how they interact over time.

PRIMARY PREVENTION IN ICELAND

Since the early 2000s, the population-based prevention approach initiated in the late 1990s has been developed and refined further by the Icelandic Center for Social Research and Analysis (ICSRA) at Reykjavik University, in collaboration with the City of Reykjavik and other municipalities that include more than 80% of the approximately 320 000 inhabitants of Iceland. In addition to incorporating a broad community-based participatory research (CBPR) approach into the project [11], ICSRA has worked with support from the Ministry of Education, Science and Culture to conduct annual population-based, cross-sectional surveys to monitor substance use among 9th- and 10th-grade students in all schools throughout Iceland. Response rates for the entire population cohort surveyed each year have ranged between 80 and 90%. Every 3 years the ICSRA surveys, entitled 'Youth in Iceland', focus on broad categories of interest. For the purposes of this report, those categories include: (a) substance use, where measurement is similar to the

Monitoring the Future surveys being conducted in the United States [12] and the ESPAD surveys in Europe [5]; (b) protective factors for substance use, with focus on factors that have been known to decrease the odds of substance use among teens, such as parental support, monitoring and co-communication, school wellbeing and participation in constructive recreational and extracurricular activities such as organized sports [10,13–15]; and (c) risk factors for substance use such as unsupervised idle hours, party life-style and peer substance use [16–19].

Findings from the annual ICSRA surveys are used to construct local-level reports that are distributed to local communities in a standardized format within 2–3 months after each round of data collection has been completed. School-level reports are submitted to school personnel and parent–teacher organizations and the municipal-level reports are disseminated to municipal agents, including prevention workers, health promotion professionals, policy specialists and other key community stakeholders. The City of Reykjavik and other larger municipalities in Iceland also require multiple layers of reports, including school level, area/district level and city level, and a country-wide report is developed for the Ministry of Education, Science and Culture and is posted at the Ministry's web site. This initiative has been funded primarily by participating municipalities, each of which signs a 4-year renewable contract with ICSRA for services.

The aims of this study were to: (1) assess the linear time trends in substance use and primary prevention variables among adolescents in Iceland from 1997 to 2014; (2) assess the population-based relationship between primary prevention variables and substance use among this youth population; and (3) test the interaction relationship between primary prevention variables and time on adolescent substance use.

METHOD

Intervention

The philosophical pillars underlying the population-level approach to substance use prevention in Iceland are based on a commitment to multi-level CBPR; using empirical evidence to inform policy and guide local-level practice; and fostering collaboration between social and behavioral health scientists, policymakers and key local stakeholders and practitioners, including parents, public health practitioners, school personnel and professionals working in community youth organizations (see references [2], [15] and [20] for additional details of the approach and activities).

Several core strategies are used when implementing this primary prevention approach. First, rapidly disseminating survey findings enhances the real-time, practical utility of the results. Secondly, providing dissemination

reports that provide school- or neighborhood-specific information enhances the relevance of the findings for local stakeholders, practitioners and policymakers. Thirdly, building a long-term community-level commitment to curtailing adolescent substance use and creating an environment that is low in risk factors and high in protective factors for substance use, thus promoting the social construction of an environment in which the default choice of adolescents is to select behaviors and activities that confer protection and reduce the risk of substance use [2,9,10,15,20]. Fourthly, ICSRA defines risk and protective factors for substance use that are based on the research literature but does not offer a standardized intervention 'prevention package' to participating communities. This decision requires local stakeholders to select priorities and strategies that are tailored to their specific communities and to which they are committed to implementing. Finally, school and municipal reports are confidential and are owned and disseminated by the schools and municipalities that primarily fund the project. In almost all instances, schools and municipal officers disseminate the reports to all interested local parties (i.e. parent-teacher organizations, governmental agencies, municipal service offices, social workers, law enforcement, leisure-time workers, etc.), and some even post them at their websites.

These core strategies foster local-level control and thus reduce the anxiety that can accompany high-stakes evaluation and encourages all stakeholders to work together towards mutual goals. Working with the ICSRA as a partner that provides the specific methodological and data-related set of skills, rather than acting as enforcement or compliance agent, each community sets its own goals. This cycle of reporting, dissemination and community dialogue between researchers, policymakers and practitioners is then repeated and reiterated annually in the community's health promotion efforts.

Sample and data

All aspects of this study take account of the STROBE (STrengthening the Reporting of OBServational studies in Epidemiology) statement. This study utilized seven waves of data from a series of population-wide, cross-sectional school surveys of Youth in Iceland that were conducted by the ICSRA in collaboration with the Icelandic Ministry of Education, Science and Culture. Study procedures were approved by the Icelandic authority overseeing the protection of human research subjects and data were obtained using passive parental consent. The surveys were conducted among all accessible students in 9th and 10th grades (14- and 16-year-old adolescents) in all secondary schools in Iceland during February or March in 1997, 2000, 2003, 2006, 2009, 2012 and 2014. The number

of respondents ranged between 6346 and 7758 each year, which accounts for between 81 and 90% of the total population in those age groups ($n = 50\,412$, boys = 50%).

Table 1 shows the total number of participants, response rates and gender ratios for each of the 7 years of data analyzed in the present study.

Measures

The questions in the Youth in Iceland school surveys have been adapted from international surveys of similar kind, such as the Monitoring the Future in the United States [12] and ESPAD, the comparative European monitoring survey [5]. In the present study, an identical set of core questions for any cigarette smoking during the last 30 days, daily cigarette smoking during the last 30 days, any alcohol use during the last 30 days and drunkenness during the last 30 days was utilized in all years. Questions on risk and protective factors were also utilized during all seven waves of data collection. Specifically, we asked questions on parental monitoring and involvement in their children's social lives, participation in organized sports and engagement in party life-style.

Dependent variables

Alcohol use

Any alcohol use during the last 30 days was assessed with the question: 'How often have you had a drink of alcohol of any kind during last 30 days?' (1 = never, 2 = 1–2 times, 3 = 3–5 times, 4 = 6–9 times, 5 = 10–19 times, 6 = 20–39 times and 7 = 40 times or more). Responses were collapsed to form a dichotomized variable (0 = no and 1 = yes, once or more often). Alcohol intoxication during last 30 days was assessed with the question: 'How often

Table 1 Number of participants in 9th and 10th grades (14–16 years) in the Youth in Iceland surveys, 1997, 2000^a, 2003^b, 2006, 2009, 2012 and 2014.

Year	<i>n</i>	% of population	% boys
1997	7758	90	52
2000	6346	82	49
2003	7099	81	52
2006	7430	82	50
2009	7514	84	49
2012	7267	85	50
2014	6998	86	49
Total	50 412	84	50

^aIn 2000 the Youth in Iceland survey did not include the question on parents knowing the friends' parents, and operated with different coding categories for the party life-style variable. These variables are therefore not included in the analyses for that year. ^bIn 2003 the Youth in Iceland survey became the Icelandic part of the ESPAD study (Hibell *et al.*, 2004). Measures on parental monitoring and social involvement as well as sport participation are inapplicable for that year.

have you become intoxicated during last 30 days?' (1 = never, 2 = 1–2 times, 3 = 3–5 times, 4 = 6–9 times, 5 = 10–19 times, 6 = 20–39 times and 7 = 40 times or more). As with any alcohol use, responses were collapsed to form a dichotomized variable (0 = no and 1 = yes, once or more often).

Smoking behavior

Any smoking and daily smoking during the last 30 days were assessed with the question: 'How much on average have you smoked during the last 30 days?' (1 = nothing, 2 = less than one cigarette per week, 3 = less than one cigarette per day, 4 = 1–5 cigarettes per day, 5 = 6–10 cigarettes per day, 6 = 11–20 cigarettes per day and 7 = more than 20 cigarettes per day). For any smoking, responses were collapsed to form a dichotomized variable (0 = nothing and 1 = yes, once or more often) and for daily smoking, scores were summed to form a dichotomized variable (0 = nothing or less than daily and 1 = daily).

Primary prevention variables

Parental behavior. Parental monitoring was assessed with two questions under the heading: 'How well does the following apply to you?'. These included: (a) 'My parents know with whom I am in the evenings' and (b) 'My parents know where I am in the evenings'. Parental social involvement was assessed with two questions under the heading: 'How well does the following apply to you?', and that included (a) 'My parents know my friends' and (b) 'My parents know my friends' parents'. Response categories were 1 = applies to me very well, 2 = applies to me rather well, 3 = applies to me rather badly and 4 = applies to me very badly. For the purpose of these analyses, variable scores on these items were reverse-coded.

Participation in organized sports. Participation in organized sports with a club or team was assessed with the question: 'How often do you participate in sports with a club or a team?' (1 = almost never, 2 = once per week, 3 = 2–3 times per week, 4 = 4–6 times per week and 5 = almost every day). It should be noted that sports teams in Iceland are area- and/or neighborhood-based clubs, not school teams, and are supervised by responsible and well-trained adults [19].

Party life-style. Party life-style was assessed with the question: 'How often does the following apply to you: going to parties (1 = almost never, 2 = less than once per month, 3 = 1–3 times per month, 4 = 1–3 times per week and 5 = 4 times per week or more often)?'.

Control variables. In our statistical models we controlled for gender (girls = 1), family structure [0 = lives with both parents (~70%), 1 = lives in other arrangements] and mother's and father's education (scored 1 = primary school or less to 6 = college graduate).

Data collection procedures

Data collection procedures for the Youth in Iceland surveys have remained the same from 1997 to this date and have been described in detail in Kristjansson *et al.* [21]. All students who attended school on the day of the survey in the respective grades completed the questionnaires within their regular classrooms under teacher supervision of ICSRA protocols. Students were instructed to complete the entire questionnaire, but to ask for help if they had any problems or questions for clarification. Students were asked to place their completed questionnaires in sealed envelopes before returning them to the supervising teacher.

Data analyses

In order to assess our first aim, we used the Cochran–Armitage test for trend in 2×1 tables against a χ^2 distribution to assess time trends in the four outcome variables across the seven waves of survey data [22]. We then used analysis of variance (ANOVA) for linear trend to assess the time trends in primary prevention variables across the seven waves of data. For our second aim we tested six logistic regression models for every outcome variable while controlling for background variables (see Table 3). Finally, for aim 3 we estimated the interaction relationship between each primary prevention variable, time and each outcome with six logistic regression models for each outcome (see Table 4). For all six independent variables, the interaction term was created by multiplying the mean-centered independent variable with the mean-centered time variable.

RESULTS

Table 2 shows the prevalence trends in all four outcome variables and mean scores in the primary prevention variables across the seven waves of data. As shown, all forms of substance use declined significantly during the time-period and the mean scores in the primary prevention variables improved significantly across the seven waves of data.

Table 3 shows the results of six logistic regression models for each of the four outcome variables. In all instances the relationship between the primary prevention variables and the outcome is highly significant and in the predicted direction. These analyses show the average population change in the substance use outcome variables against a unit change in the primary prevention variables.

Table 4 includes the interaction test between each of the primary prevention variables and time on each outcome. All are significant except for the variables on party life-style and smoking. Although these analyses cannot be viewed as suggestive of causal variable relationships, this means that while the population rates in each of the primary prevention variables increased in strength over

Table 2 Trend analyses for independent variables (\bar{X}) and outcome variables (%) in the study.

	1997	2000	2003	2006	2009	2012	2014	
	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	Cochran–Armitage for linear trend
Outcome variables (%)								
Any smoking in last 30 days	27.0 (26.0–28.0)	20.8 (19.8–21.9)	16.7 (15.7–17.6)	15.5 (14.7–16.3)	12.5 (11.7–13.3)	4.9 (4.4–5.4)	3.6 (3.2–4.0)	$\chi^2_{(1)} = 2337.4, P < 0.001$
Daily smoking	17.0 (16.2–17.8)	13.0 (12.1–13.8)	10.6 (9.9–11.3)	8.8 (8.1–9.4)	7.0 (6.4–7.6)	2.5 (2.1–2.9)	1.6 (1.3–1.9)	$\chi^2_{(1)} = 1614.3, P < 0.001$
Any alcohol use in last 30 days	39.5 (38.4–40.6)	41.1 (39.9–42.4)	29.1 (28.0–30.2)	33.0 (31.9–34.1)	23.7 (22.7–24.6)	11.4 (10.7–12.1)	7.1 (6.5–7.7)	$\chi^2_{(1)} = 3297.8, P < 0.001$
Drunkness in last 30 days	29.6 (28.5–30.6)	25.1 (24.0–26.2)	20.6 (19.7–21.6)	18.2 (17.3–19.1)	13.1 (12.3–13.9)	5.1 (4.6–5.6)	3.6 (3.2–4.1)	$\chi^2_{(1)} = 2846.8, P < 0.001$
Independent variables, \bar{X}	1997	2000	2003	2006	2009	2012	2014	ANOVA for linear trend
Parents know where I am	(SD) 2.44 (1.04)	(SD) 2.50 (1.04)	(SD) NA	(SD) 2.85 (0.96)	(SD) 3.01 (0.92)	(SD) 2.95 (0.94)	(SD) 3.08 (0.92)	$F_{(1, 42635)}, 2538.3, P < 0.001$
Parents know with whom I am	2.73 (1.01)	2.72 (1.00)	NA	2.99 (0.91)	3.14 (0.87)	3.11 (0.88)	3.22 (0.87)	$F_{(1, 42586)}, 1776.4, P < 0.001$
Parents know my friends	3.47 (0.72)	3.45 (0.75)	NA	3.41 (0.73)	3.40 (0.73)	3.47 (0.70)	3.57 (0.66)	$F_{(1, 42681)}, 34.5, P < 0.001$
Parents know my friends' parents	2.79 (0.95)	NA	NA	2.87 (0.91)	2.87 (0.91)	3.00 (0.88)	3.11 (0.88)	$F_{(1, 36345)}, 433.5, P < 0.001$
Organized sport participation	2.29 (1.42)	2.34 (1.49)	NA	2.41 (1.51)	2.52 (1.52)	2.68 (1.53)	2.68 (1.53)	$F_{(1, 41869)}, 410.3, P < 0.001$
Party life-style	2.23 (1.03)	NA	2.05 (0.93)	1.96 (1.01)	1.68 (0.88)	1.62 (0.81)	1.71 (0.85)	$F_{(1, 38773)}, 2033.1, P < 0.001$

NA = not available; ANOVA = analysis of variance; CI = confidence interval; SD = standard deviation.

Table 3 Logistic regression models of the relationship between independent variables and outcome variables, controlling for gender, family structure and parental education.

<i>Independent variables</i>	<i>Any smoking in last 30 days</i>	<i>Daily smoking</i>	<i>Any alcohol use in last 30 days</i>	<i>Drunkenness in last 30 days</i>
	<i>Exp(B) (95% CI)</i>	<i>Exp(B) (95% CI)</i>	<i>Exp(B) (95% CI)</i>	<i>Exp(B) (95% CI)</i>
Parents know with whom I am	0.65 (0.63–0.67)	0.61 (0.59–0.64)	0.66 (0.65–0.68)	0.64 (0.63–0.66)
Parents know where I am	0.59 (0.57–0.61)	0.57 (0.54–0.59)	0.62 (0.60–0.63)	0.59 (0.58–0.61)
Parents know my friends	0.61 (0.58–0.63)	0.62 (0.60–0.65)	0.62 (0.60–0.64)	0.63 (0.61–0.66)
Parents know my friends' parents	0.59 (0.57–0.61)	0.58 (0.55–0.60)	0.64 (0.62–0.66)	0.63 (0.61–0.66)
Participation in organized sports	0.70 (0.69–0.72)	0.65 (0.63–0.67)	0.80 (0.79–0.82)	0.79 (0.77–0.81)
Party life-style	2.86 (2.77–2.96)	2.99 (2.87–3.11)	3.16 (3.07–3.26)	3.94 (3.80–4.09)

CI = confidence interval.

Table 4 Logistic regression models of interaction relationship between independent variables and time on outcome variables, controlling for gender, family structure and parental education.^a

<i>Independent variables</i>	<i>Any smoking in last 30 days</i>	<i>Daily smoking</i>	<i>Any alcohol use in last 30 days</i>	<i>Drunkenness in last 30 days</i>
	<i>Exp(B) (95% CI)</i>	<i>Exp(B) (95% CI)</i>	<i>Exp(B) (95% CI)</i>	<i>Exp(B) (95% CI)</i>
Parents know with whom I am × time	0.95 (0.93–0.96)	0.95 (0.93–0.97)	0.95 (0.94–0.96)	0.96 (0.94–0.97)
Parents know where I am × time	0.95 (0.94–0.96)	0.95 (0.94–0.97)	0.95 (0.94–0.96)	0.96 (0.95–0.97)
Parents know my friends × time	0.92 (0.90–0.94)	0.92 (0.90–0.94)	0.96 (0.95–0.97)	0.95 (0.93–0.96)
Parents know my friends' parents × time	0.94 (0.92–0.95)	0.94 (0.92–0.96)	0.96 (0.95–0.98)	0.96 (0.95–0.98)
Participation in organized sports × time	0.97 (0.96–0.98)	0.97 (0.95–0.98)	0.98 (0.97–0.98)	0.97 (0.96–0.98)
Party life-style × time	1.00 (0.98–1.02)	1.01 (0.99–1.03)	0.97 (0.95–0.98)	0.98 (0.96–1.00)

^aThe respective independent variables and time (year) were also included in each model but are not shown to save space. CI = confidence interval.

time, substance use decreased in the population during the same time-period.

DISCUSSION

With respect to our first study aim, the findings of this study show that rates of smoking and alcohol use declined steadily in the adolescent population in Iceland from 1997 to 2014. The analyses also show a consistent increase in protective primary prevention variables and a subsequent decline in risk factor variables during the study period. For our second aim, we observed a significant relationship between primary prevention variables and all the outcome variables. In our third aim, we found a significant interaction relationship between most of the primary prevention variables and the outcomes in the hypothesized direction.

Although we are unable to establish a statistical linkage between the substance use and primary prevention variables in Iceland, due to the nature of the study design, the findings regarding the trend in substance use ostensibly support the efficacy of the CBPR-based approaches to population-level substance use prevention, at least as they

have been conducted in Iceland. CBPR asserts that a community partnership that is created with mutual and long-term goals between researchers, policymakers and practitioners, and nurtured and maintained consistently by all stakeholders involved, is more likely to result in sustainable change than short-term 'programs' with fixed beginning and end-points [11]. The Icelandic community health promotion approach to primary substance use prevention among adolescents represents such a CBPR formulation. It has integrated research and practice effectively using a standardized 'toolkit' of research methods that, when used consistently over time, provides important information for local stakeholders to make community-specific decisions with a high likelihood of achieving a successful outcome. This toolkit approach to prevention is consistent with recent recommendations for the development and application of applied approaches to population health problems, which integrates research with evidence-based practice most effectively [23–25]. Thus, our analyses would appear to endorse the substance use prevention approach that was initiated in Iceland in the late 1990s [2,15,20].

The Icelandic experience may, however, also provide some support of the Health Impact Pyramid [26]. The Health Impact Pyramid posits that larger population-level impact is expected to be reached in prevention when the principal focus is set on systematic and holistic, long-term changes, such as 'changing the context to make individual decisions healthy' ([26], Figure 1, p. 591), rather than with greater individual-based efforts such as through 'counseling and education'. In this context, the Icelandic primary prevention approach represents an environmental and contextually specific system within which to address substance use prevention with adolescents. In this system, data from repeated cross-sectional surveys have been used for more than a decade-and-a-half to secure the buy-in, participation, involvement and ownership of the problem by local stakeholders in each community, including parents, school personnel, municipal agents, leisure-time workers and others. By making survey findings available to all parties and by reporting those findings in an easily understandable and application-friendly format, the data can be used by community stakeholders in a more rapid and effective manner. Similarly, the quality and applicability of the research is improved by community-engaged dialogue about previous, current and future areas of importance, such as new drugs, new ways of using them and distributional techniques.

Several limitations and cautions are worth noting in the interpretation of these findings. First, despite the observed linear time trends and the relationship between the primary prevention variables, time and the outcomes, the study design precludes demonstrating definitive causal evidence that exposure to the community-based health promotion approach is the sole reason for the observed decline in substance use. As a result, we are unable to dismiss the potential impact of secular trends in adolescent substance use that have been observed in the other Nordic countries, although the decline has not been as dramatic as it has been in Iceland [5]. Secondly, Iceland is isolated geographically, with a comparatively small and homogeneous population. A replication of the Icelandic primary prevention approach in larger and more heterogeneous societies may prove challenging. However, a pan-European, urban prevention effort called 'Youth in Europe' [21,27] has been initiated to facilitate a replication and extension of the Icelandic experience, with implementation and systematic dissemination of the effort now in the early stages. Thirdly, various other parallel prevention efforts to counter adolescent substance use and delinquent behaviors were implemented in Iceland during the period of the study. These included national media campaigns to discourage adolescent alcohol use and cigarette smoking; a national school-based anti-smoking initiative; and legislative mandates that decreased visibility and access to alcohol and tobacco products and banned smoking in all indoor

public places [10]. We were unable to control statistically for the potential contamination effects of these other initiatives.

In conclusion, our analyses of the study data show a substantial decline in adolescent substance use in Iceland from 1997 to 2014—a decline that parallels the significant strengthening of primary substance use prevention variables during the same years. In spite of these findings, we cannot be certain that the Icelandic prevention approach initiated in the late 1990s caused these positive outcomes. However, until public health researchers develop better models for evaluating population-level health promotion initiatives, the methods described in this paper provide the best estimates currently available [11,23–26]. Nevertheless, regardless of how the observed changes were initiated, this study provides evidence that changes in population-level rates of substance use were associated with corresponding decreases in primary prevention variables over time.

Declaration of interests

None.

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