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7. COMMUNITY VARIATION IN ADOLESCENT ALCOHOL USE IN AUSTRALIA AND THE NETHERLANDS

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ABSTRACT

Aims: To investigate the cross-national relevance of community health promotion, this paper compared community variation in alcohol use and risk and protective influencing factors for adolescents in Australia (State of Victoria, 2009) and the Netherlands (2007/2008). Design: Multi-level analyses examined community variation in heavy episodic (binge) alcohol use (≥ 5 drinks in a session \geq once in the prior fortnight [>63 millilitres of ethanol]) and associations with predictors. Setting: Representative community samples of adolescents (12–17 years). Participants: 7,812 students from 36 Australian communities and 15,082 adolescents from 124 Dutch communities. Measurements: Predictors included adolescent reports of family, school, peer and neighbourhood environments and community predictors (rurality, disadvantage). Findings: Overall alcohol use prevalence was similar in both nations. Australia had higher use at younger ages and no difference between genders. In the Netherlands older adolescents and males used at significantly higher rates. Although individual predictors were mostly similar, binge drinking was more strongly associated with poor family management, friend's use of drugs and community disorganization in Australia. Significant community variation in adolescent heavy alcohol use was observed in both countries, but was higher in the Netherlands (Inter Class Correlation 6.1%, [95% CI: 4.5–8.3%]) than Australia (ICC 2.4%, 1.3–4.5%). Youth from rural areas drank at a higher level, especially in the Netherlands. Conclusions: Targeting community level adolescent alcohol use appears feasible in both countries. Although behavioural patterns and risk and protective influences are similar in the Netherlands and Australia, important differences should be taken into account in tailoring community interventions.

INTRODUCTION

Misuse of alcohol is a problem around the world (Ezzati et al., 2002). Although alcohol use typically begins in adolescence, research on adolescent alcohol use and related problems is lacking in many regions (Karam et al., 2007). Comparative cross national studies on the variation in the prevalence and aetiology of adolescent substance use and related behaviour can make valuable contributions to policy and prevention science (Beyers et al., 2004; Jessor et al., 2002; Hosman, 2000).

Australia and the Netherlands are notable in the international drug policy context as both have adopted harm minimisation policies, focussing on reducing related-harms rather than alcohol and drug use per se (Simons Norton et al, 2010; Laar et al., 2007). Differences in youth alcohol policies in these two nations include the legal minimum age for alcohol purchase, which is 18 across Australia and 16 in the Netherlands for low alcohol drinks. This paper emerges from recent interest in both countries in supplementing existing health promotion with community preventative approaches (Loxley et al., 2005). Youth surveys of secondary school age adolescents were recently completed across the State of Victoria in Australia and the Netherlands. Both surveys used culturally adapted versions of the Communities that Care youth survey (Arthur et al., 2007; Arthur et al., 2002) that was designed to accurately measure community rates of youth alcohol and other substance use, related behaviours and risk and protective influencing factors selected to provide potential prevention targets. These surveys provided the opportunity to compare patterns of alcohol use and associations with risk and protective factors amongst adolescents in Australia and the Netherlands and to study these associations in the context of different communities.

Alcohol use among youth appears to have risen during recent decades in both Australia (White and Hayman, 2004) and Europe (Hibell et al., 2004). Australian trends show a lower initiation age, higher rates of heavy drinking (Karam et al., 2007) and increases in alcohol-related hospitalizations amongst those aged under 18 (Chikritzhs et al., 2004). Similar trends are evident in the Netherlands (Ministerie van Volksgezondheid, Welzijn en Sport, 2007), where 10 to 15 year old adolescents hospitalized for alcohol poisoning increased sixteen fold over the previous decade (Valkenberg et al., 2007).

Although cross-national comparative research studies are emerging, there has been little research comparing European and Australian youth. In this paper we sought to investigate to what extent community-level influences on individual behaviour were similar or different between these two countries. The current paper aimed to specifically investigate the extent of community variation in adolescent alcohol behaviour and their association with community-level influencing factors. Recently evaluations of the Communities That Care (CtC) intervention in the United States have shown that adolescent alcohol use can be reduced by disseminating preventive interventions encouraging healthy community environments for children and young people (Hawkins et al., 2009). Such interventions assume that communities vary both in the rates of adolescent alcohol use and in modifiable influencing risk and protective factors that can be reduced through preventive interventions (Hawkins et al., 2009). The CtC framework assumes that, differences in modifiable risk and protective factors will, at least partially, explain community variation in relevant outcomes such as adolescent alcohol use. In investigating community variation in alcohol use it is important to control for macro social determinants (structural variables) such as rural and community socioeconomic disadvantage. These higher level structural variables may also contribute to community variation in youth health behaviours and alcohol use and influence risk and protective factors in the different countries, however, they are less malleable to community intervention (Galea, 2007).

This paper compares patterns of youth alcohol use in 36 Australian and 124 communities in the Netherlands and the associations with risk and protective factors and structural variables like rural geographic location and community disadvantage. Based on existing research showing similar alcohol trends in the two countries, we hypothesise that community variation and influencing individual and structural variables will be similar in the two countries.

METHODS

PROCEDURE

In both countries data were collected using culturally adapted versions of the CtC Youth Survey (Arthur et al., 2007; Arthur et al., 2002). The adaptations sought to retain the semantic meaning of items and the resulting country specific questionnaires show similar psychometric properties to the original USA survey instrument (Jonkman et al., 2006; Beyers et al., 2004).

Australian data were collected in 2009 through the HowRU secondary student survey that was designed to provide representative epidemiological estimates for all metropolitan local government communities and non-metropolitan regions across the state of Victoria. A two-stage cluster sample design was used to recruit students. In the first stage, schools were randomly selected based on a probability proportional to each community's grade-level size from a stratified sampling frame of all schools in Victoria (government, Catholic, and independent). At stage 2, single intact classes from Grades 7, 9 and 11 were randomly selected in each school. Survey procedures were approved through the Royal Children's Hospital Ethics Office and relevant school authorities. Of the 13,501 eligible students, 10,242 (77.2%) consented and participated.

As part of the implementation of CtC in the Netherlands Municipal Health Services and independent research organisations conducted household surveys, using a common protocol and syntax in ten separated community-studies between 2008 and 2009 (mean participation rate 31,7%). All data were merged into a single dataset comprising 17,961 respondents aged between 12 and 17 years (eligible 31,3%).

SAMPLE

Community sampling in Australia (Victoria) was based on the school location within local government areas across Metropolitan Melbourne and Education Department Regions outside of the main city of Melbourne, reflecting the major community units responsible for youth services. After exclusion of respondents with missing data on relevant measures, the analytic sample comprised 7,812 students aged 12 to 17 attending schools in 36 community areas. The sample size in each area ranged from 117 to 322 (mean 219) respondents.

In the Netherlands community geographic boundaries were defined based on the City, Town, and neighbourhood catchment areas used to define and manage services. Respondents were assigned to a community according to residential address and participants were excluded when their community was unclear or had fewer than 20 survey respondents. The Netherlands analytic sample comprised 15,082 youth aged 12 to 17 years, residing in 124 community areas within 17 municipalities and the sample numbers within community areas ranged from 20 to 472 (mean 121).

MEASURES

Alcohol use: Items were equivalent to those in national US youth monitoring surveys (Johnston et al., 2007). Respondents were asked “on how many occasions (if any) have you ... had more than just a few sips of an alcoholic beverage (like beer, wine or liquor/spirits)?” over their lifetime and in the past 30 days. Responses were dichotomized as ever use (1 or more occasions of use in lifetime) and last month use (use in the past 30 days). To estimate rates of *binge drinking* respondents were asked “over the past 2 weeks ... how many times have you had five or more alcoholic drinks in a row?” and responses were dichotomized (any binge drinking).

Risk factors: Responses for each risk (and protective) factor scale were coded from 1 to 4 (e.g., strongly agree, agree, disagree, strongly disagree; YES! yes no NO!). Eight scales common to both the Australian and Netherlands surveys were included in analyses (mean Cronbach alpha in the Australian sample [a_{AUS}] =.74; mean Cronbach alpha in the Netherlands [a_{NL}] =.70). Family factors are: ‘Problems with family management’ (8 items e.g., “The rules in my family are very clear”; “My parents want to know if I don’t come home on time”, a_{AUS} =.80, a_{NL} =.75), ‘Conflicts in the family’ (3 items, e.g. “People in my family have serious arguments.” a_{AUS} =.78, a_{NL} =.74), ‘Parental attitudes favourable toward drug use’ (3 items, e.g. “How wrong do your parents feel it would be for you to smoke cigarettes?” a_{AUS} =.66, a_{NL} =.59), ‘Parental attitudes favourable towards anti social behaviour’ (3 items, “How wrong do your parents feel it would be for you to: steal something worth more than \$10?” a_{AUS} =.74, a_{NL} =.65). The school factor is: ‘Academic failure’ (2 items, e.g. “Putting them all together, what were your marks like last year?” a_{AUS} =.67, a_{NL} =.58). Peer risk was measured with ‘Friends use of drugs’ (4 items, e.g. “In the past 12 months how many of your 4 best friends have: Tried alcohol when their parents didn’t know about it?” a_{AUS} =.77, a_{NL} =.70). Community risk factors included: ‘Low neighbourhood attachment’ (3 items, e.g. “I’d like to get out of my neighbourhood.” a_{AUS} =.76, a_{NL} =.85) and ‘Community Disorganisation’ (4 items: e.g. “How much does each of the following statements describe your neighbourhood: Lots of graffiti.” a_{AUS} =.77, a_{NL} =.77).

Protective factors: Five scales (mean $a_{\text{AUS}} = .73$; mean $a_{\text{NL}} = .72$) relevant to adolescent family and school environments were included. Three family scales were used ‘Attachment’ (6 items, e.g. “Do you feel close to your mother?” $a_{\text{AUS}} = .84$, $a_{\text{NL}} = .85$), ‘Opportunities for Pro social Involvement’ (3 items, “If I had a personal problem, I could ask my mum and dad for help.” $a_{\text{AUS}} = .70$, $a_{\text{NL}} = .74$) and ‘Rewards for Pro social Involvement’ (2 items, e.g. “My parents notice when I am doing a good job and let me know about it.” $a_{\text{AUS}} = .84$, $a_{\text{NL}} = .83$). For school we asked about ‘Opportunities for Pro social Involvement’ (4 items, e.g. “I have lots of chances to be part of class discussions or activities.” $a_{\text{AUS}} = .62$, $a_{\text{NL}} = .57$) and ‘Rewards for pro social Involvement’ (3 items, e.g. “I feel safe at my school.” $a_{\text{AUS}} = .67$, $a_{\text{NL}} = .62$).

Structural indicators: We defined “structural” variables for the adolescents’ residential communities by dichotomising rural and high disadvantage areas yes/no. In the Netherlands a community area was defined as rural if the majority of people lived within low population density areas (Centraal Bureau voor de Statistiek, 2011). Disadvantage was defined based on income, education and employment (Steketee et al., 2011). In Victoria rural was based on location outside the Melbourne metropolitan region. The population density of Victoria is 24 persons per square kilometre and within the metropolitan area it is 530 per square kilometre. Disadvantaged communities were those with a disadvantage score in the lowest 20% of the 2001 Australian Bureau of Statistics Census Socio Economic Indices For Area (SEIFA) scores.

ANALYSIS

Both datasets were compared on similar individual outcomes, demographical variables, risk and protective factors and structural factors. We compared alcohol use in both countries with hierarchical modeling (using STATA 11.2) to account for the community clustering effects and created separate models for each country (Hox, 2010; Heck and Thomas, 2009; Rabe-Hesketh and Skondal, 2008; Bartholomew et al., 2008). Initially we ran simple two level intercept models (Model# 0) where individual data are corrected for community influence. Then we introduced individual socio-demographic variables (Model #1), followed by individual predictors based on risk and protective factors. (Model #2). Finally, we added structural variables on community level (rural and disadvantage, Model #3). By comparing more complex with simpler models we assessed the contribution of individual and community influences based on model fit (deviance) and variance components.

RESULTS

Table 1 presents the sample characteristics. In the Netherlands more than twice as many respondents lived in a rural area, while in Australia more respondents lived in disadvantaged areas. The Australian sample (mean ages=14,45) has relatively more 12, 14 and 16 year olds, the Dutch sample (mean ages=14,4) more 13, 15 and 17 year olds. Both samples had slightly more females than males (NL 55.3%, AU 52.5% females). The majority identified themselves as being born in the country surveyed (Dutch or Australian background); in the Netherlands one fifth were migrant youth while Australia -a younger nation- had more migrant respondents (one third of the sample). The Australian sample has 10% more adolescents who live in a 'non-traditional' family (single parent, step parents, grandparents etc). As expected, the majority in both countries have siblings (3% higher in the Netherlands).

Table 1. *Sample characteristics*

	Australia	Netherlands
	N= 7,812	N= 15,082
Rural	16.4%	36.0%
Disadvantage	23.0%	19.8%
Age 12	17.1%	15.4%
13	14.6%	18.7%
14	20.8%	18.3%
15	15.5%	17.9%
16	19.6%	15.7%
17	12.5%	13.9%
Female	52.3%	55.3%
Migrant	29.2%	18.4%
'Non traditional' family	28.3%	18.3%
Siblings	83.5%	86.5%

Table 2 presents prevalence estimates and confidence intervals for different patterns of alcohol use in Australia and the Netherlands. The data reveal general similarities in cross-national levels of alcohol use for boys and girls in the 12 to 17 age group. Boys in the Netherlands had higher binge drinking rates than girls, while rates were similar across gender in Australia.

Table 2. Prevalence Rates of Adolescent Alcohol use in Australia and the Netherlands

	Australia		Netherlands	
	Boys	Girls	Boys	Girls
Alcohol ever use	62.1% [59.3 – 64.8]	61.2% [58.1 -64.3]	61.0% [58.4 – 63.2]	60.2% [58.0 – 62.3]
Alcohol last month use	36.7% [33.7 – 39.6]	38.9% [35.8 -42.0]	41.1% [38.4 – 43.8]	41.2% [38.7 – 43.7]
Binge drinking	18.6% [16.5 – 20.7]	18.0% [15.8 – 20.4]	20.1% [17.9 – 22.3]	15.9% [14.2 – 17.6]
Total	N=3,724	N=4,088	N=6,744	N=8,337

Table 3. Multilevel Models Predicting Binge Alcohol Use in Australia

AUSTRALIA								
Model	Model 0 (Empty)		Model 1 (Individual Variables)		Model 2 (IV, Risks, Protection)		Model 3 (IV, Risks, Protection, Structural Variables Coeff.	
	Coeff.	(s.e.)	Coeff.	(s.e.)	Coeff.	(s.e.)	Coeff.	(s.e.)
Fixed								
Intercept	- 1.53	(0.06)	- 2.94	(0.13)	- 8.9	(0.52)	-9.00	(0.52)
Individual Variables								
Age			0.55***	(0.02)	0.26***	(0.03)	0.26***	(0.03)
Gender (boys=ref)			- 0.04	0.06	- 0.01	(0.07)	-0.01	(0.07)
Migrants (Aus=ref)			- 0.68***	(0.08)	- 0.385***	(0.09)	-0.36***	(0.09)
Family (two parents = ref)			0.42***	0.07	0.01	(0.08)	0.01	(0.8)
Brothers/sisters (no= ref)			- 0.09	0.08	- 0.06	(0.10)	-0.05	(0.1)
Risks								
F: Family management					0.53***	(0.08)	0.53***	(0.08)
F: Family conflict					0.18***	(0.05)	0.19***	(0.05)
F: Parents attitude t. drug use					0.69***	0.07	0.69***	(0.07)
F: Parent attitude t. AS-beh.					-0.02**	(0.07)	-0.02	(0.07)
S: Academic failure					0.3*	(0.06)	0.28***	(0.06)
P: Friends use of drugs					1.3***	(0.06)	1.3***	(0.6)
C: Low attachment					-0.02	(0.05)	-0.03	(0.05)
C: Com. Disorganisation					0.20***	(0.06)	0.21***	(0.06)
Protection								
F: Attachment family					-0.16*	(0.08)	-0.16	(0.05)
F: Opportunity Pro social					0.22**	(0.08)	0.22**	(0.08)
F: Rewards pro social					0.13*	(0.06)	0.13*	(0.06)

S: Opportunities pro social	0.14	(0.09)	0.15	(0.09)
S: Rewards pro social	-0.04	(0.08)	-0.04	(0.08)
Structural variables				
Rural			0.40**	(0.15)
Disadvantage				
Random				
Variance	0.10	(0.03)	0.07	(0.03)
Deviance	-3771.2442		-3326.7575	
			-2598.8742	
			0.05	(0.02)
			-2595.6423	

Note. ** $p < 0.001$; * $p < 0.01$; * $p < 0.05$

Table 3 reveals the findings for the multilevel models in Victoria. The variation in binge alcohol use associated with community location was significant (intraclass correlation coefficient [ICC] 2.4%, 1.3 – 4.5%). Improvements in the model fit (based on Deviance) were observed for each step from Model#0 to #3. Model#1 reveals a significant influence of Age (OR=1.73) and Family-status (OR=1.51) in increasing the risk of binge alcohol use, while a decreased risk was associated with Migrant ethnicity (OR=0.51). Model#2 shows that after controlling for other influences, a number of risk and protective factors maintained significant associations with binge drinking. Friend's use of drugs (OR=3.84) and Parental attitudes favourable towards drug use (OR=1.99) are especially important risk factors. Three protective factors were significant. Family Attachment (OR=0.85) lowers binge drinking by 15%, after adjusting for other influences, Opportunities (OR=1.23) and Rewards for Prosocial behaviour in the Family (OR= 1.14) increase the risk of binge drinking. With the addition of the demographic variables, and risk and protective factors, the variance between the 36 Australian communities increases. In Model#3 Rural and Disadvantage were found to be highly interrelated, however, only Rural had a significant effect and was therefore presented in the model. Living in a rural area strongly influences binge drinking after controlling for all other variables (49% higher), and this effect was related to the higher disadvantage in rural areas. The addition of the non-significant variables hardly influences associations between binge drinking and the significant variables but it lowers the variance between communities from 0.08 to 0.05 and the model fit improves slightly.

Table 4 presents the multi-level findings for the Netherlands. The variation in binge alcohol use associated with community location as measured by ICC was 6.1% [95% CI: 4.5 – 8.3%] indicating the variation between the Dutch communities is higher than between the Australian communities. As for Victoria, each of the more complex models showed improved fit in the Netherlands. Model#1 reveals that the model fit decreases by adding the demographic variables Age (OR=2.20), Family (OR=1.54), Gender (OR=0.63), Migrant (OR=0.49) and Brothers/Sisters (OR=0.76). The variance between communities increases by adding these variables. Model #2 reveals that, after adjusting for demographic variables, a number of risk and protective factors show independent associations

with binge drinking. Friends' use of drugs (OR=4.18), Parental attitudes favourable towards drug use (OR=2.56), Family Management (OR=1.42) and Academic Failure (OR=1.36) are each associated with youth binge drinking. The protective factor, School opportunities for pro-social involvement lowers the outcome by 17%. Model 3# revealed the additional influence of the structural variables. For comparative reasons we kept Rural area in our Model#3 (OR=2.18) and as for Australia, the influence of individual variables hardly changed in Model#3. Adding Rural lowers the community variance from 0.24 to 0.12 and strengthens the model fit. We also tested a slope-model (Model#4, interaction of rural and other variables) but the deviance indice (loglikelihood) didn't improve in either country. Model#3 is our final model for both countries.

Table 4. Multilevel Models Predicting Binge Alcohol Use in the Netherland

NETHERLANDS								
Model	Model 0 (Empty)		Model 1 (Individual Variables)		Model 2 (IV, Risks, Protection)		Model 3 (IV, Risks, Protection, Structural Variables)	
	Coeff.	(s.e.)	Coeff.	(s.e.)	Coeff.	(s.e)	Coeff.	(s.e)
Fixed								
Intercept	-1.54	(0.05)	- 3.41	(0.16)	- 7.37	(0.48)	- 7.8	(0.5)
Individual Variables								
Age			0.79***	(0.18)	0.45***	(0.02)	0.45***	(0.02)
Gender (boys=ref)			- 0.47***	(0.05)	- 0.40***	(0.06)	- 0.40***	(0.06)
Migrants (Neth=ref)			- 0.73***	(0.08)	- 0.36***	(0.09)	- 0.30**	(0.09)
Family (two parents = ref)			0.43***	(0.06)	0.06	(0.07)	0.06	(0.07)
Brothers/sisters (no= ref)			- 0.28***	(0.07)	- 0.13	(0.08)	- 0.16*	(0.08)
Risks								
F: Family management					0.35***	(0.08)	0.34***	(0.08)
F: Family conflict					0.08	(0.05)	0.08	(0.05)
F: Parents attitude t. drug use					0.94***	(0.06)	0.93***	(0.06)
F: Parent attitude t. AS-beh.					- 0.14	(0.08)	- 0.13*	(0.08)
S: Academic failure					0.31***	(0.05)	0.31***	(0.05)
P: Friends use of drugs					0.14***	(0.05)	1.43***	(0.05)
C: Low attachment					- 0.12**	(0.04)	- 0.12**	(0.04)
C: Com. Disorganisation					- 0.12	(0.06)	- 0.07	(0.06)
Protection								
F: Attachment family					0.01	(0.08)	- 0.01	(0.08)
F: Opportunity Pro social					0.16	(0.08)	0.16*	(0.08)
F: Rewards pro social					- 0.06	(0.06)	- 0.05	(0.06)
S: Opportunities pro social					- 0.19**	(0.06)	- 0.19**	(0.06)
S: Rewards pro social					- 0.03	(0.07)	0.03	(0.07)
Structural variables								
Rural							0.78***	(0.09)
Disadvantage								
Random								
Variance	0.22	(0.04)	0.29	(0.05)	0.24	(0.05)	0.12	(0.03)
Deviance	-6949.7738		-5561.5858		-4538.4338		-- 4509.0332	

Note. ** $p < 0.001$; * $p < 0.01$; * $p < 0.05$

DISCUSSION

The above analyses present the first cross-national comparison of the community variation in school age adolescent alcohol consumption in Australia and the Netherlands. In line with the hypotheses, the overall prevalence of alcohol use was similar in both countries, however, some differences were apparent. Australian students had higher use at younger ages and similar rates across gender, while in the Netherlands older males and rural youth used at significantly higher rates. At age 12 to 14 rates of binge drinking were higher in Victoria (8.3%, 6.8 – 9.8%) compared to the Netherlands (4.8%, 3.8 – 5.7%), with no significant gender difference in either country. At ages 15 to 17 binge drinking rates in Victoria were 29.4% (26.8 – 32.0%) with no significant gender difference. Rates were similar for same-aged girls in the Netherlands (27.5%, 24.6 – 30.3%), while the rates for boys were significantly higher (38.2%, 34.5 – 41.8%). The finding of higher rates of binge alcohol use amongst early adolescents in Australia is somewhat surprising given the older minimum legal purchase age (18 in Australia compared to 16 in the Netherlands) and of concern due to the vulnerability of the brain to heavy doses of alcohol at early ages (White and Swartwelder, 2004). The positive association of youth alcohol use with family opportunities and rewards in Australia (Table 5) suggests that alcohol use at family functions may be more common within Australia and suggests a need for parental education on the effects of alcohol at early ages. Significant community variation in adolescent alcohol use was observed in both countries, although it was higher in the Netherlands.

The lower rate of binge alcohol use amongst girls and young adolescents in the Netherlands, together with very high rates amongst older adolescents and males living in rural communities, fits with the finding that heavy adolescent alcohol use shows high community variation in the Netherlands, warranting a community targeted approach.

Importantly, the current analysis confirmed the hypothesis that the association between adolescent binge drinking and modifiable risk and protective factors was consistent across both countries. These effects were maintained after controlling for structural variables. This conclusion is similar to that in previous cross-national comparisons between the USA and Australia (Beyers et al., 2004) and the USA and the Netherlands (Oesterle et al., 2011). In both countries we see the same important influence of the risk factor ‘Friends use of Drugs’ (Peers).

Where risk factors were found to have different cross-national influences, the patterns suggested alcohol use was more strongly associated with developmental problems in Australia (Family Conflict, Low School Commitment), while Parental Attitudes towards Drug Use and Anti social behaviour were more influential in the Netherlands. Opportunities for Pro social behaviour in school also had some protective effect in the Netherlands. In both countries living in a rural community influenced binge drinking, however, in the Netherlands this influence is stronger. Interaction effects between individual factors and the structural variable Rural were not found. Strengths of this study include the large age-matched samples of adolescents that responded to the same measures in each country, the use of multilevel modelling to analyse community variation, and the analysis of individual risk and protective factors (individual/lower level) and structural variables (community/higher level).

Several limitations are also noted. Different sampling procedures were used, potentially biasing the comparison of community variation. Government youth policy in the Netherlands is organised on the basis of Cities and Towns. Community geographic boundaries have been defined across the Netherlands as sites for working to improve environments for young people and these were the community units selected for the present investigation.

Victoria is one of seven States and Territories in Australia. The geographic areas defined in Victoria for the present analysis tended to be larger than those in the Netherlands and were not based on an analysis of natural communities. In Victoria the definition of rural aggregated all youth located in schools outside of metropolitan Melbourne and, hence included a number of youth living in regional cities. Although the survey identified significant community variation in patterns of adolescent heavy alcohol use in Victoria, for the above reasons the analysis is considered to underestimate that variation. The classroom survey in Victoria was different to the household survey design in the Netherlands, reflecting the reality that school catchments are less aligned with community organisation in the Netherlands. To enable community variation to be cross-nationally comparable, the presented results did not adjust for the classroom clustering in Victoria but allowed this to contribute to community variation. We reran the Victoria analysis adjusting for both community and classroom clustering and found no major differences to the results presented.

Despite differences in survey design, the present study found mostly similarities in each country in the pattern of community variation in adolescent alcohol behaviours that was partly explained by modifiable risk and protective factors. Targeting adolescent alcohol use at a community level appears feasible both in the Netherlands and Victoria. Although behavioural patterns and risk and protective influences show many cross-national similarities, observable differences in the age and gender profile, associated factors as well as community location should be taken into account in tailoring community interventions to reduce alcohol related harms in both countries.

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Authors contributors

HJ, MS and JT designed, analysed and wrote this study. JW managed data collection in Victoria and participated in the analyses and writing of this manuscript. KC did the data management. All authors have been involved in revising the manuscript. All authors read and improved the final manuscript.