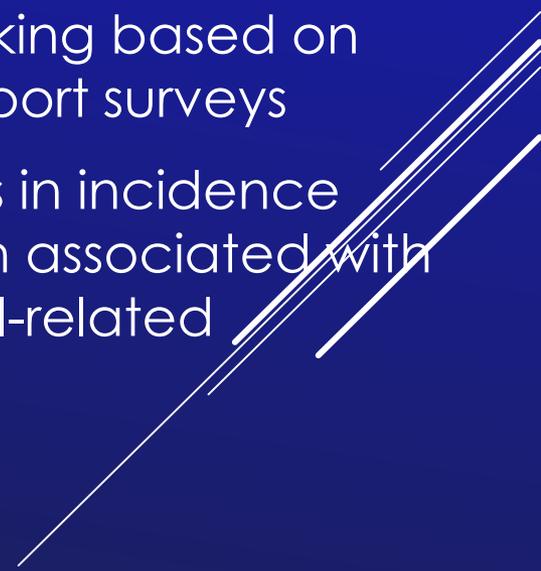# TRENDS AND RISK MARKERS OF STUDENT HAZARDOUS DRINKING – A COMPARATIVE ANALYSIS USING LONGITUDINALLY LINKED DATASETS IN A U.S. PUBLIC UNIVERSITY

Duc Anh Ngo MD DrPH[1,3], Nassima Ait-Daoud MD[1,2], Saumitra Rege PhD[2], Susan Davis JD[1], Christopher Holstege MD[1,3],

[1]Department of Student Health/Division of Student Affairs, [2]Department of Psychiatry and Neurobehavioral Sciences, [3]Department of Emergency Medicine/School of Medicine; University of Virginia, Charlottesville, VA

INTRODUCTION

▶ To date, self-report surveys on a sample of students using the binge drinking threshold is the primary source of data to identify at risk drinkers and monitor the burden of alcohol misuse among college students

▶ Surveys are subject to certain limitations due to refusal, non-response, and reporting or recall bias , limited research has focused on evaluating student hazardous drinking based on data sources other than cross-sectional self-report surveys

▶ This study examined and compared the trends in incidence and risk markers of student alcohol intoxication associated with Emergency Department (ED) visits and alcohol-related incidents in a U.S. public university

METHODS

- Seven-year (2010/11-2015/16) student enrollment data were linked to subsequent ED visits with alcohol intoxication identified using ICD codes and alcohol-related incidents reported to campus authorities within one year following the first (index) annual enrollment

- Student demographic, academic, campus-related characteristics and organizational affiliation were ascertained from Student Information System

- Clinical risk markers (depression ,anxiety) were abstracted from the Student Health Records using ICD codes

- Incidence rate per 10,000 person-years was calculated, and annual trends were analyzed using Poisson Regression

- Cox proportional hazard regression was used to evaluate the risk markers associated with each outcome under study
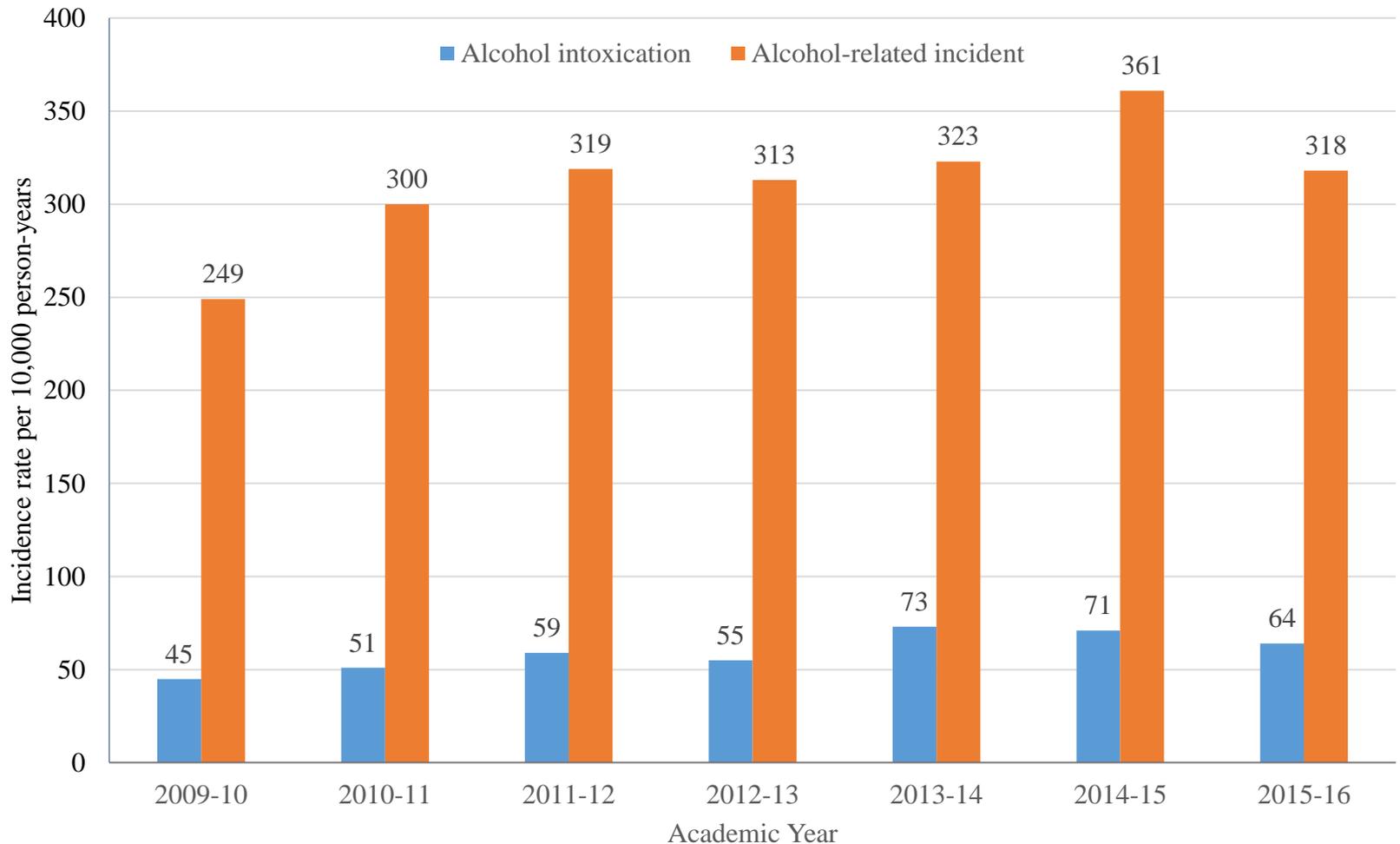
KEY FINDINGS

▶ The study cohort consisted of 204,423 students aged 16-49

▶ Incidence rates of first ED visits with alcohol intoxication and alcohol-related incidents were 59/10,000 and 311/10,000 person-years, respectively

▶ Both incidences increased linearly in the first 6 years then declined in the last year

▶ The 2 measures of student hazardous drinking shared common risk markers, including: males (versus females), below 20 years of age (versus 25-30 years), Hispanic (versus Asian) students, parental tax dependency, Greek life member, undergraduate (versus graduate) students, first time enrolled students, past year clinic visits for alcohol-related reasons and/or injury, and having an existing diagnosis of depression

▶ Being student athletes was only associated with lower risk of ED visits with alcohol intoxication, whereas transfer students were only at lower risk for alcohol-related incidents.

CHARACTERISTICS OF THE STUDY POPULATION (N =204,423)

Characteristic	Frequency	Percent	Characteristic	Frequency	Percent
Gender			**First time enrolled**		
Male	113570	55.6	No	127,259	37.8
Female	90853	44.4	Yes	77,164	62.2
Age			**Greek Life**		
16-19	54731	26.8	No	177969	87.1
20-24	80140	39.2	Yes	26454	12.9
25-29	28824	14.1	**Athlete**		
30-49	40728	19.9	No	195348	95.6
Ethnicity			Yes	9075	4.4
Asian and HPC	18102	8.9	**Parental tax dependency**		
African American	12828	6.3	No	98416	48.1
Hispanic	9696	4.7	Yes	106007	51.9
Multiracial	5575	2.7	**Past year alcohol related clinic visit**		
Non-resident	15757	7.7	No	204171	99.9
White	126107	61.7	Yes	252	0.1
Other**	16358	8	**Past year clinic visit for injury**		
Academic level			No	20185	98.7
Graduate	84256	41.2	Yes	2571	1.3
Undergraduate	120167	58.8	**Depression**		
Transfer student			No	202530	99.1
No	193,562	94.7	Yes	1893	0.9
Yes	10,861	5.3	**Anxiety**		
			No	202136	98.9
			Yes	2287	1.1

**American Indian (n=320), Native Hawaiian (n=188), and Unknown ethnicity (n=15,850)

SEVEN YEAR TRENDS IN STUDENT HAZARDOUS DRINKING INCIDENCE
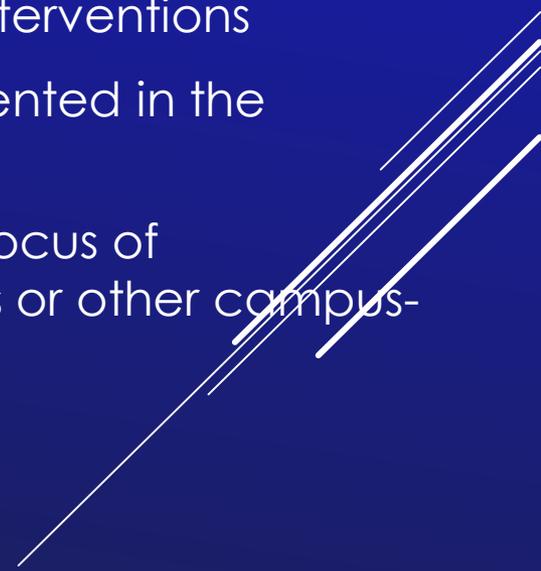
TABLE 2A. HR (95% CI) OF RISK MARKERS

Student characteristics	Alcohol intoxication AHR (95%CI)	Alcohol-related incidents AHR (95%CI)
Gender		
Female	1	1
Male	1.34 (1.18-1.51)	1.98 (1.88-2.10)
Age		
16-19	3.22 (1.98-5.26)	2.77 (2.16-3.56)
20-24	2.04 (1.27-3.25)	1.27 (1.01-1.62)
25-29	1	1
30-49	0.11 (0.04-0.33)	0.13 (0.08-0.20)
Ethnicity		
Asian	1	1
African American	1.15 (0.84-1.58)	1.40 (1.20-1.62)
Hispanic	1.42 (1.06-1.92)	1.68 (1.46-1.94)
Multiracial	1.24 (0.87-1.78)	1.45 (1.23-1.72)
Non-resident	1.02 (0.73-1.44)	0.90 (0.75-1.08)
White	1.10 (0.89-1.36)	1.59 (1.44-1.77)
Other	1.11 (0.81-1.54)	1.30 (1.11-1.52)
Parental tax dependency		
No	1	1
Yes	1.65 (1.30-2.09)	1.61 (1.44-1.79)
Greek Life		
No	1	1
Yes	1.87 (1.64-2.14)	1.96 (1.85-2.08)

Student characteristics	Alcohol intoxication AHR (95%CI)	Alcohol-related incidents AHR (95%CI)
Athlete		
No	1	1
Yes	0.53 (0.39-0.72)	-
First enrollment		
No	1	1
Yes	2.00 (1.73-2.31)	4.12 (3.84-4.42)
Academic level		
Graduate	1	1
Undergraduate	2.51 (1.82-3.45)	5.05 (4.20-6.06)
Transfer student		
No	1	1
Yes	-	0.57 (0.49-0.65)
Past year alcohol-related clinic visit		
No	1	1
Yes	3.76 1.76-8.04)	2.13 (1.27-3.56)
Past year clinic visit for injury		
No	1	1
Yes	1.67 (1.11-2.53)	1.61 (1.26-2.05)
Depression		
No	1	1
Yes	1.98 (1.24-3.15)	1.49 (1.07-2.06)
Anxiety		
No	1	1
Yes	1.97 (1.28-3.05)	-

DISCUSSION

▶ While the incidence of alcohol-related incidents reported to the university authorities was substantially higher than the incidence of alcohol intoxication associated with student ED visits, their temporal trends were the same

▶ Two student risky drinking outcomes being studied shared common demographic, academic, psychological, and campus-related risk markers, consistent with previous studies except for lack of association or inverse association with student athletes

▶ Two routinely collected student datasets can provide a reliable data source to monitor student hazardous drinking in this particular university

DISCUSSION

➢ Epidemiological research has documented that while binge drinking has been decreasing among adolescents and young adults, the use of alcohol-related hospital services – particularly of ED visits has been increasing

➢ These conflicting epidemiological trends between binge drink and alcohol-related ED visits indicate that high-intensity drinking has increased and that available intervention strategies focused on binge drinking might not been effective in reducing high-intensity drinking, especially drinking requiring emergency interventions

➢ The rising trend in alcohol-related incidents documented in the current study further highlights this apparent gap

➢ There is a strong need to reorient and expand the focus of interventions to address the rising burden of ED visits or other campus-wide problems due to heavy alcohol consumption.

CONCLUSION

- This study provides an example of the utility and usefulness of routinely collected student data in quantifying and monitoring the student hazardous drinking burden on a university campus.

- Linking student enrollment and primary healthcare data with subsequent hazardous drinking events can help not only more fully capture and monitor student hazardous drinking behaviors but also identify student groups at higher risk who can subsequently be targeted in intervention efforts.

- Given their affordability, ubiquity, and nearly real time nature, such data sources can provide an important and alternative source for surveillance, epidemiological and health services research aiming to mitigate alcohol misuse in student populations.