Substance and polysubstance use at 20 years old: a latent class analysis

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Fás Aníos in Éirinn
Growing Up in Ireland

HRB Health Research Board

INTRODUCTION

Polysubstance use has been associated with overdose, mental ill-health & sexual risk behaviour (Daskalopoulou, 2014)

Among those seeking drug treatment in Ireland in 2023, 59% reported polydrug use (HRB, 2022)

Among festival attendees aged ≥18 in Ireland in 2019, 86.8% reported polysubstance use (Ivers, 2021)

Limited knowledge about polysubstance use patterns among the general young adult population in Ireland

RESEARCH QUESTIONS

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2. What are the individual, family, social and environmental factors that predict substance use patterns at 20 years old?

METHODS

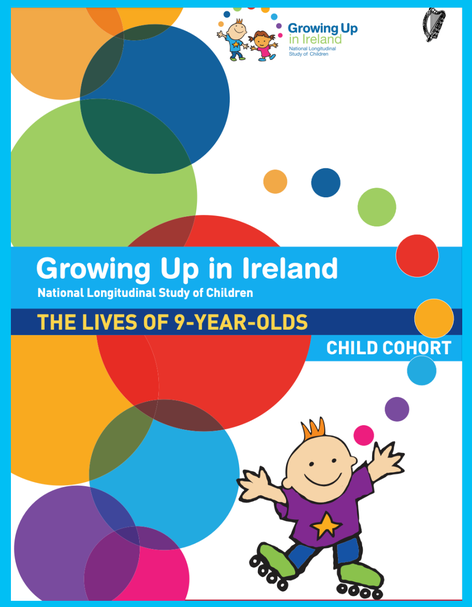
Growing Up in Ireland Cohort ‘98

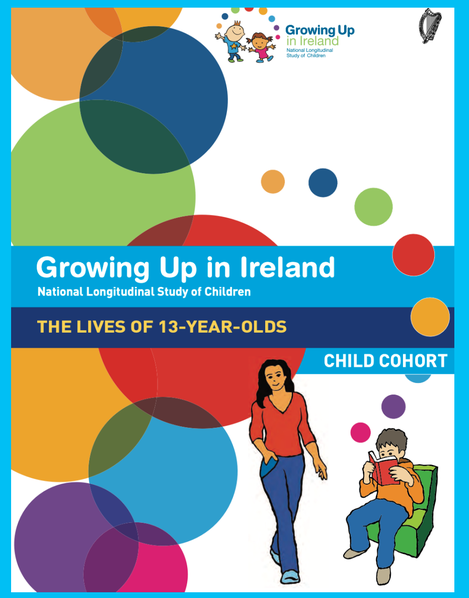
Two-stage clustered sampling:
•Primary school system as initial sampling frame

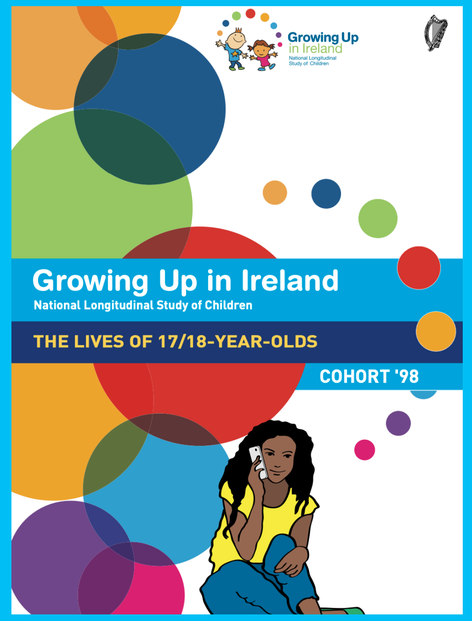
Initial sample size:
•8568 nine-year-olds
•1 in every 7 nine-year olds resident in the country

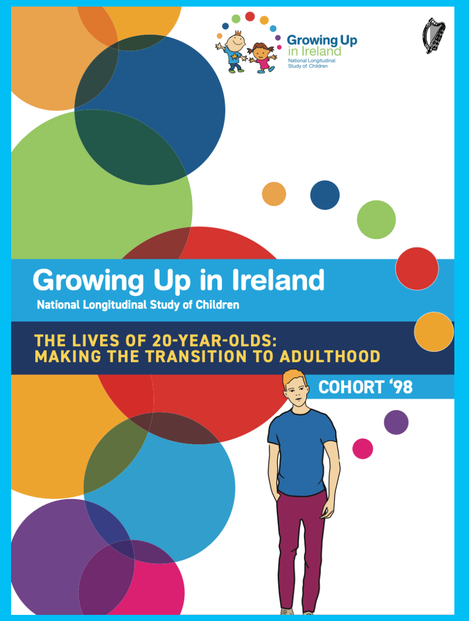
4 waves of data collection completed

Study population included those who completed Waves 1–4, excluding those who reported use of a fictitious drug and those missing observations on all substance use indicators (N=4695)





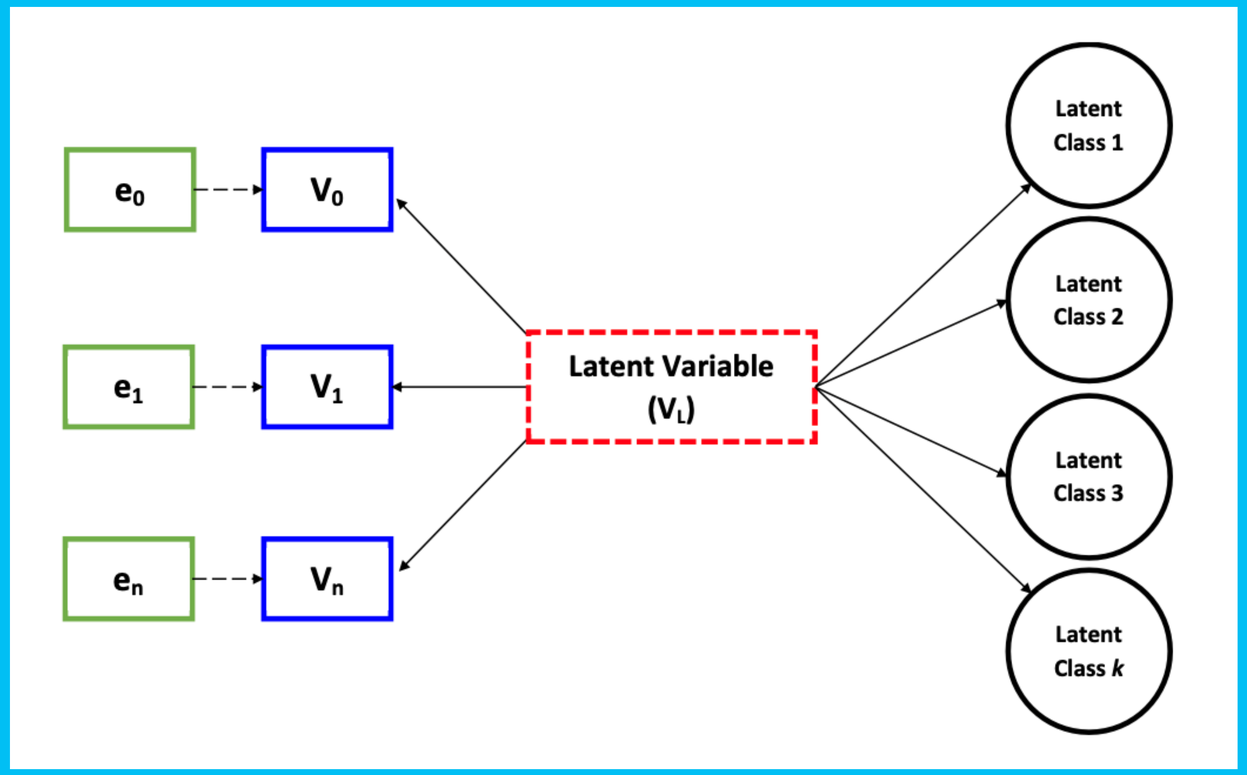




METHODS

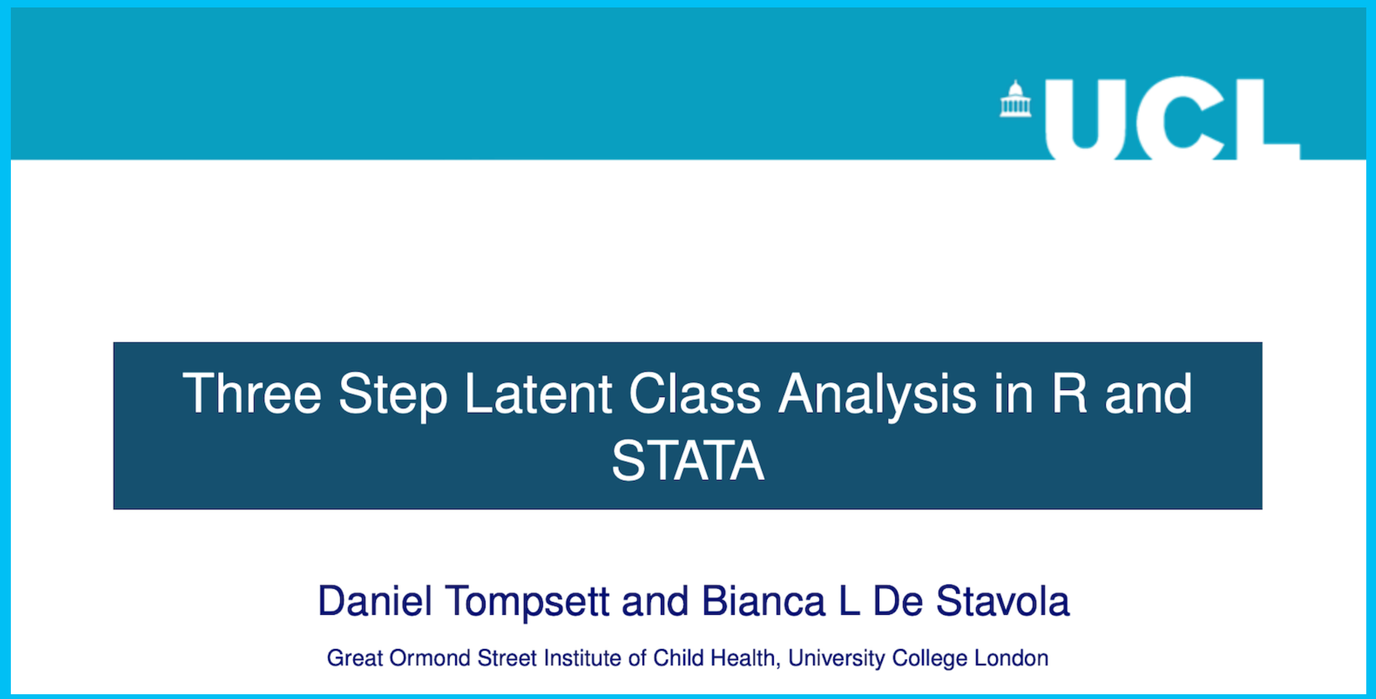
Latent class analysis - a statistical method that can infer subgroups or “latent classes” in a population grouped probabilistically based on a set of indicator variables.

V_0 AUDIT score
V_1 E-cigarette
V_2 Tobacco
V_3 Cannabis
V_4 Cocaine
V_5 Ecstasy
V_6 Ketamine
V_7 Other drugs



Aflaki, 2022

METHODS



https://www.stata.com/meeting/uk22/slides/UK22_Tompsett.pdf

Estimate series of latent class models (one- to six- classes)

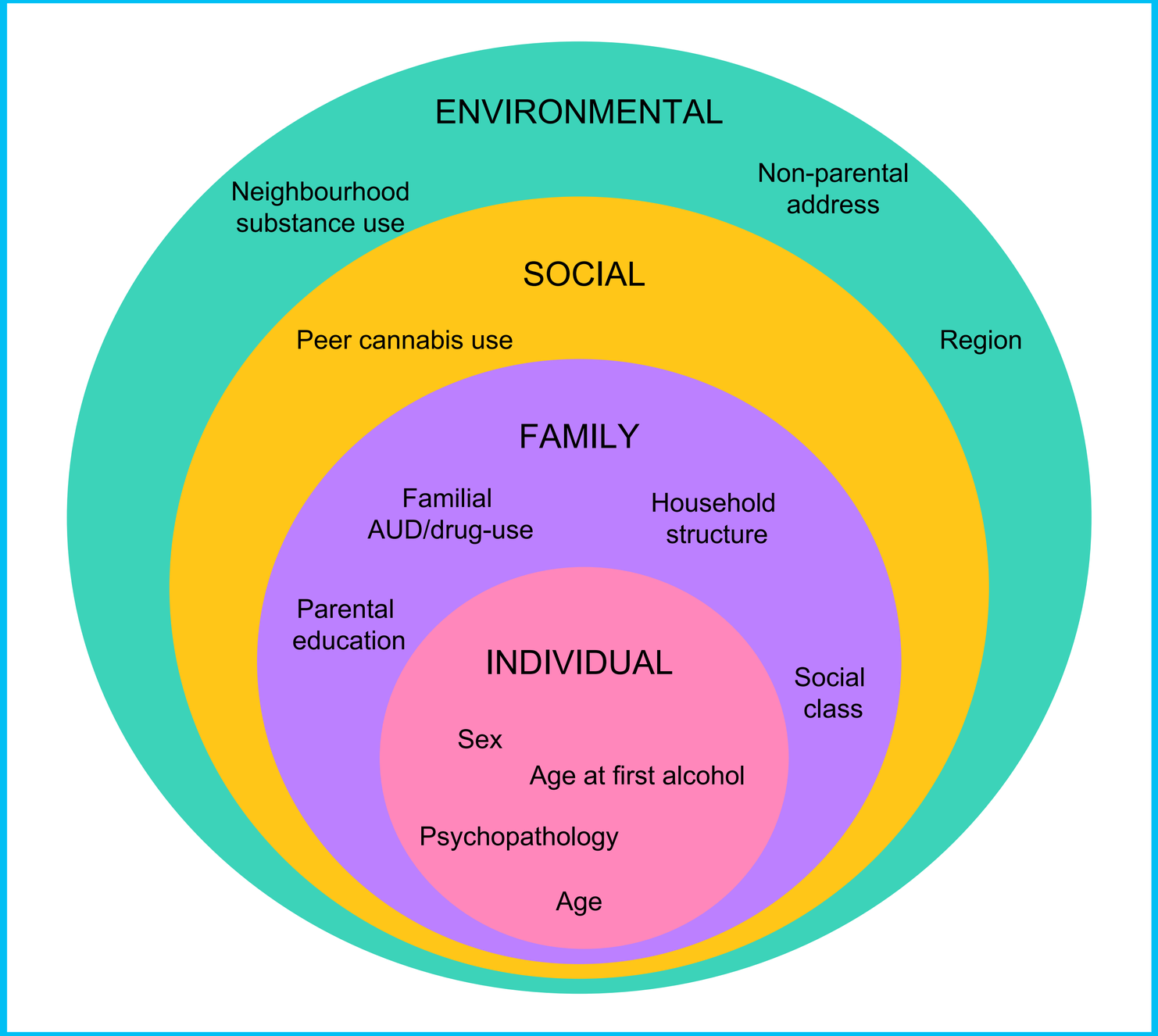
Model selection: fit indices, correlation matrices, theory

Once class selected -> modal allocation of participants to each class

Misclassification probabilities estimated to account for uncertainty in class allocation

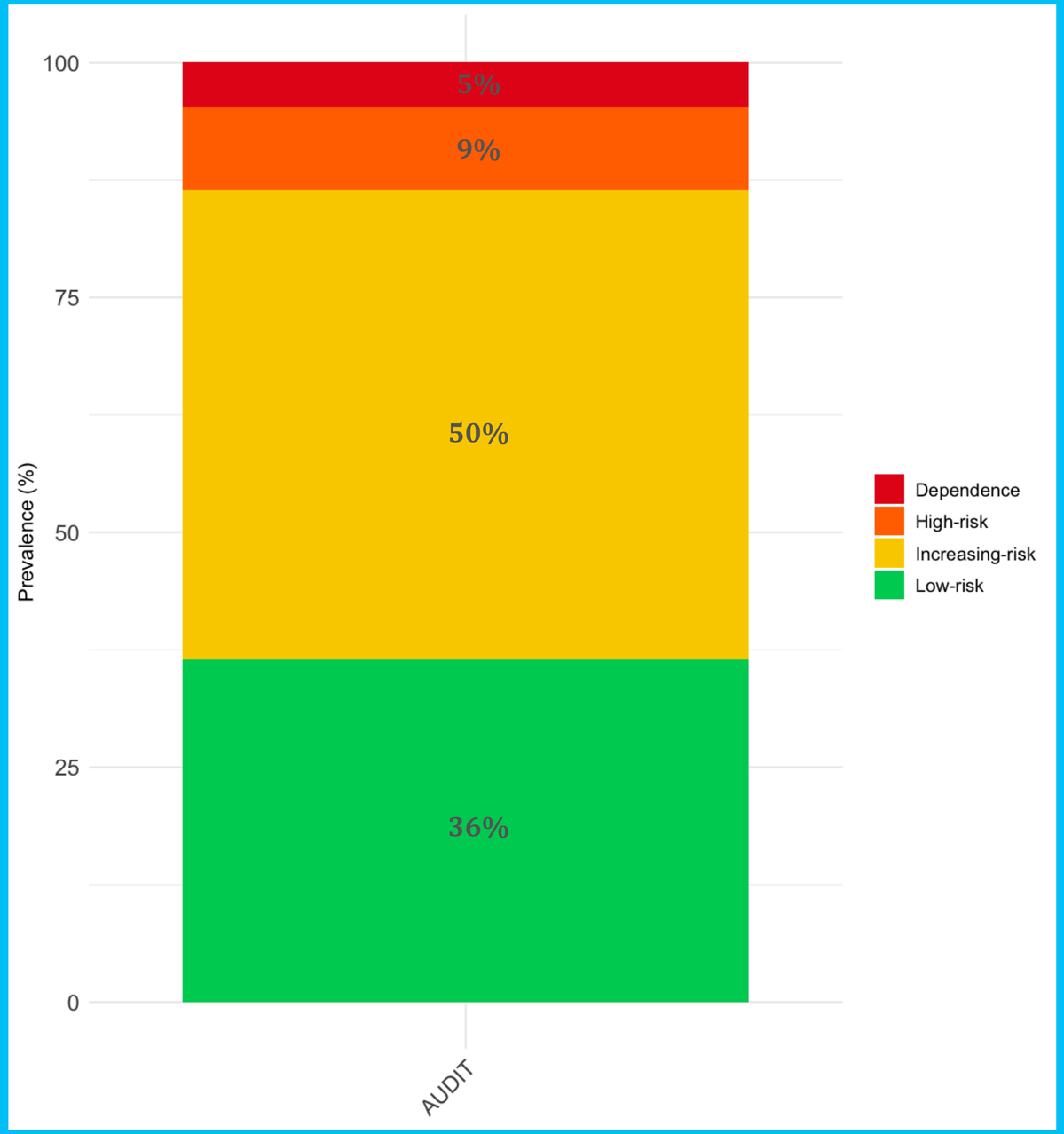
METHODS

Survey-weighted multinomial logistic regression models used to examine associations between substance use latent class membership & individual, family, socio-environmental factors



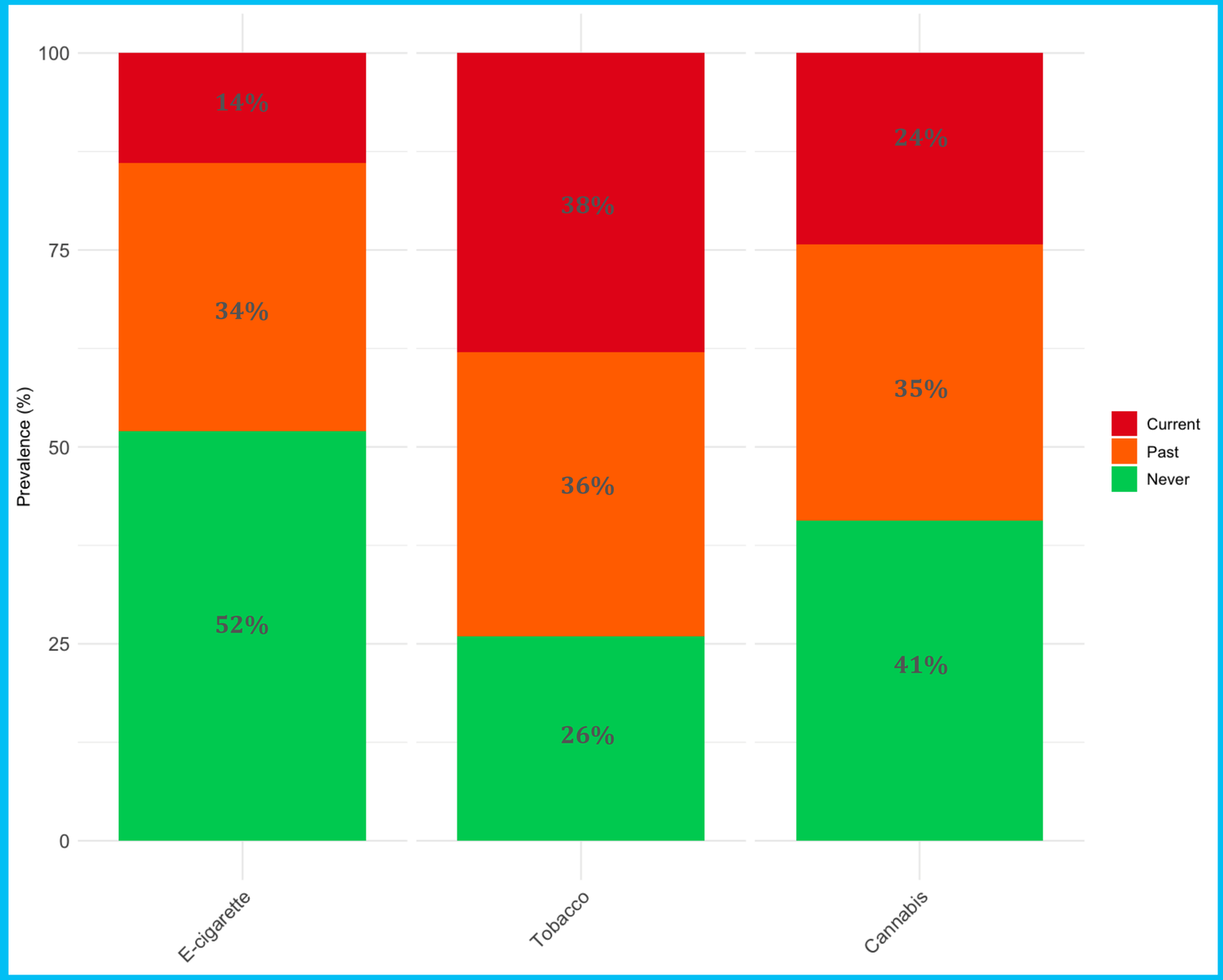
RESULTS: PREVALENCE

Alcohol Use Disorder Identification Test (AUDIT) scores at 20 years old



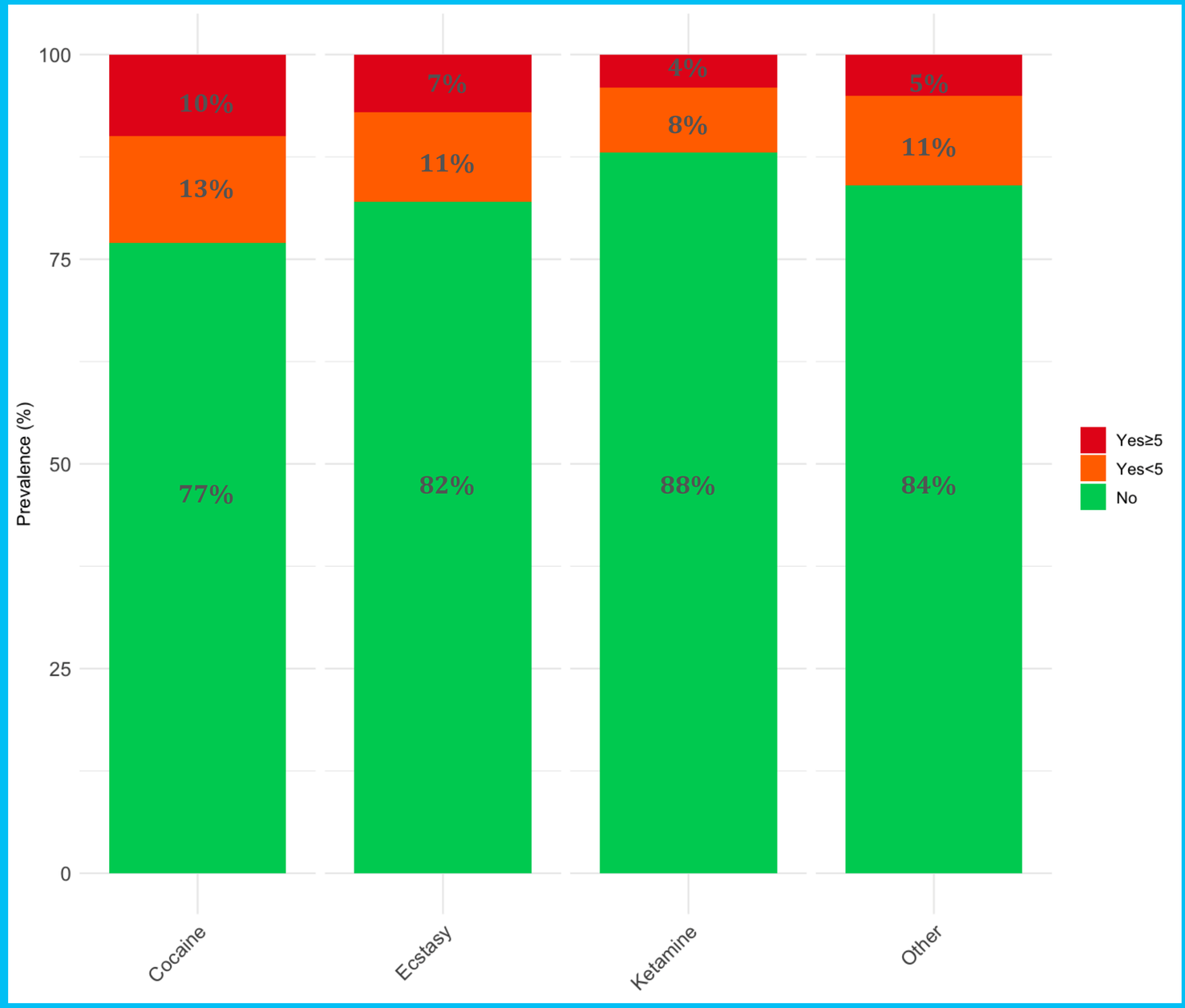
RESULTS: PREVALENCE

E-cigarette, tobacco & cannabis use at 20 years old



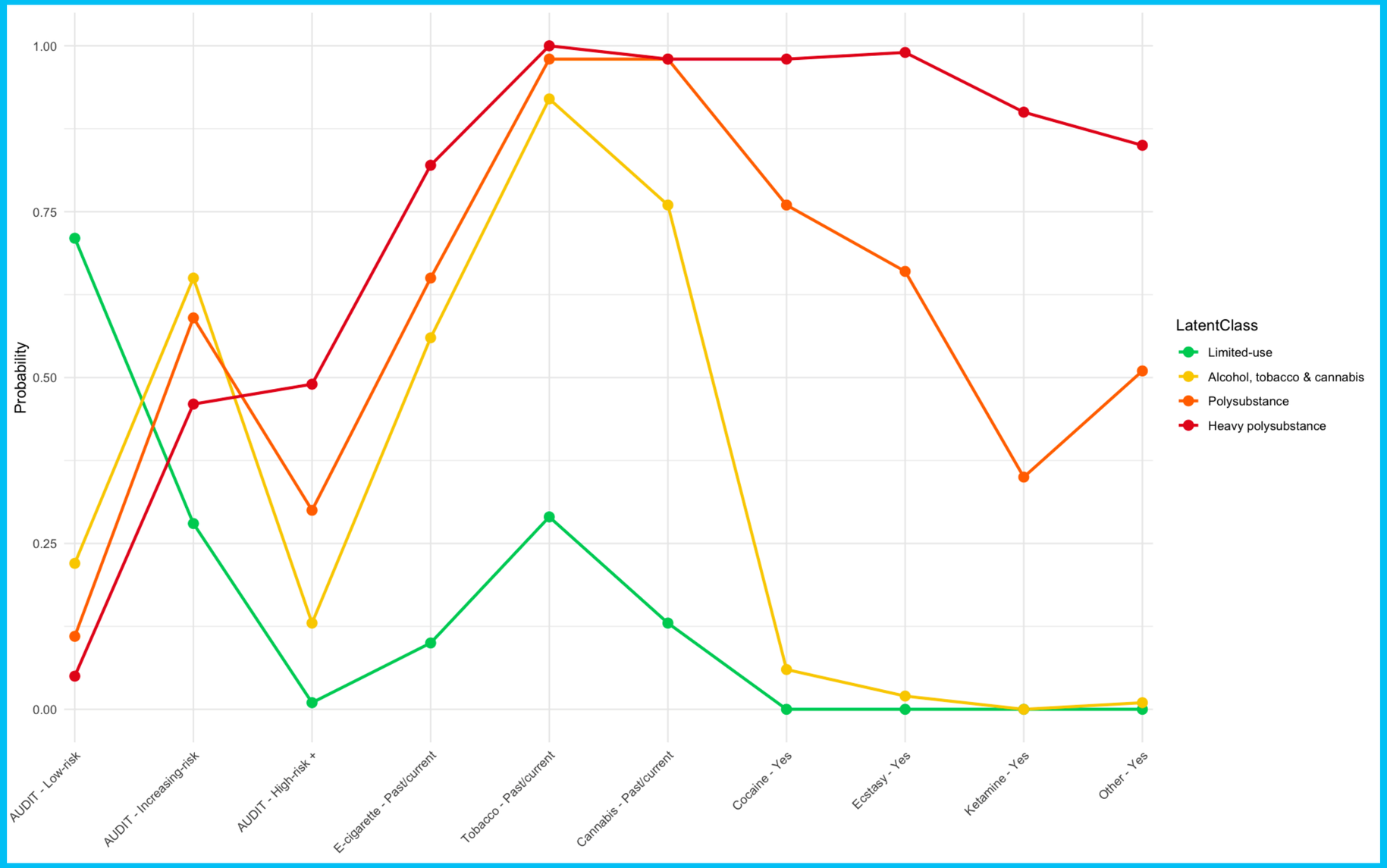
RESULTS: PREVALENCE

Cocaine, ecstasy, ketamine and other drug use at 20 years old



RESULTS: TREND GRAPH

Latent classes of substance use at 20 years old



RESULTS: PREVALENCE

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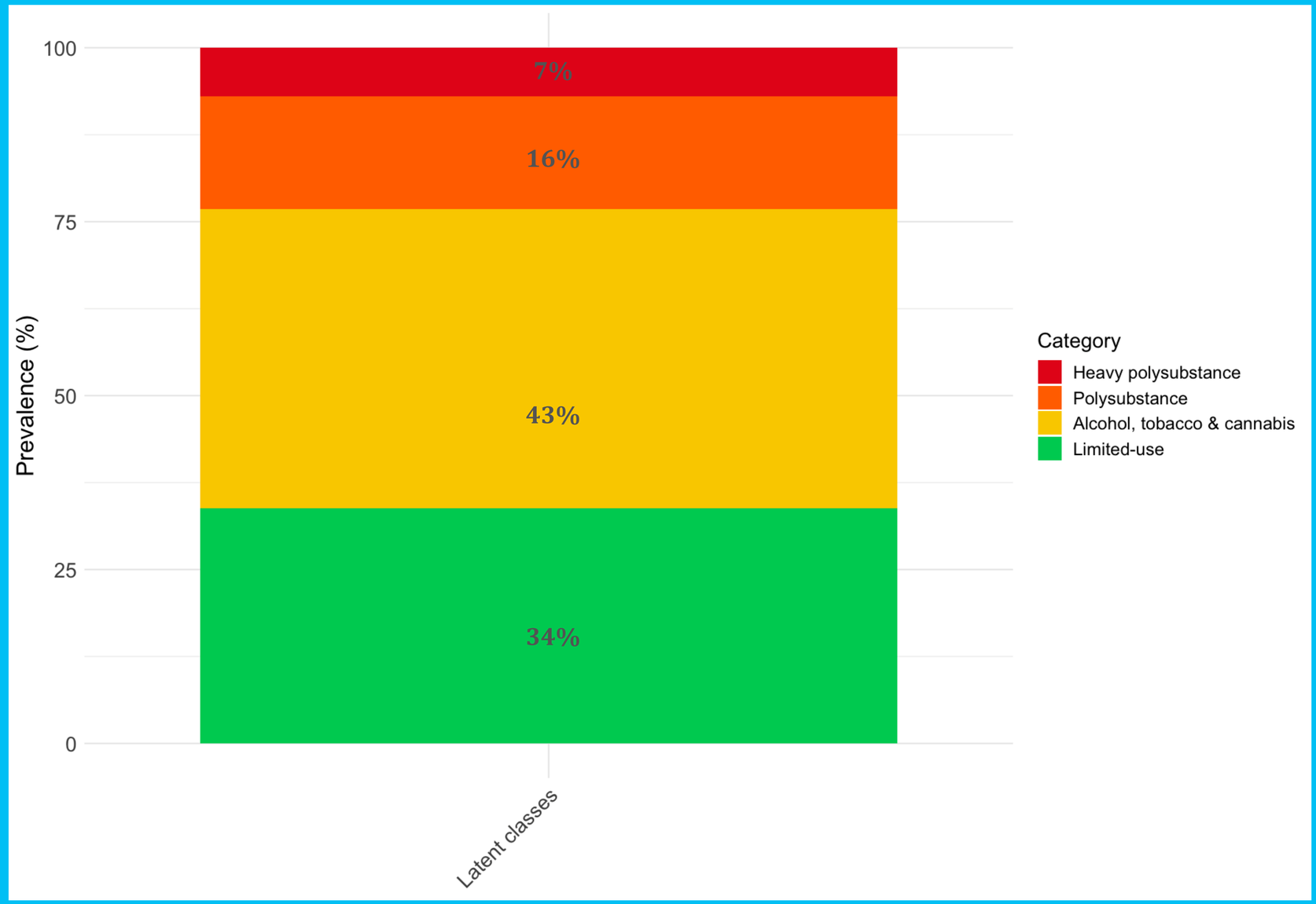

RESULTS: INDIVIDUAL FACTORS

Individual	Alcohol, tobacco, cannabis Vs Limited-use (ref)	Polysubstance Vs Limited-use (ref)	Heavy polysubstance Vs Limited-use (ref)
		aOR (95% CI)	
Age at outcome (per year older)	1.23 (0.75–2.04)	1.21 (0.64–2.29)	1.55 (0.81–2.95)
Sex			
Female	Ref	Ref	Ref
Male	1.30 (0.95–1.80)	1.63 (1.13–2.35)	2.65 (1.68–4.18)
Age at first alcoholic drink			
≤14	Ref	Ref	Ref
15	1.35 (0.74–2.46)	0.95 (0.52–1.74)	0.72 (0.37–1.40)
16	0.53 (0.33–0.83)	0.26 (0.16–0.42)	0.11 (0.06–0.20)
17	0.29 (0.18–0.47)	0.09 (0.05–0.16)	0.04 (0.02–0.09)
≥18/no alcohol	0.03 (0.01–0.09)	0.01 (0.00–0.05)	0.00 (0.00–2.49)
SDQ conduct			
Normal	Ref	Ref	Ref
Borderline	0.98 (0.63–1.51)	1.20 (0.70–2.04)	1.23 (0.66–2.28)
Abnormal	0.88 (0.49–1.61)	0.81 (0.41–1.60)	1.24 (0.58–2.62)
SDQ hyperactivity			
Normal	Ref	Ref	Ref
Borderline	0.91 (0.52–1.59)	0.70 (0.37–1.31)	0.61 (0.28–1.32)
Abnormal	1.47 (0.89–2.42)	1.19 (0.66–2.15)	1.31 (0.69–2.49)
SDQ emotional			
Normal	Ref	Ref	Ref
Borderline	0.66 (0.44–1.01)	0.66 (0.39–1.14)	0.51 (0.29–0.99)
Abnormal	0.84 (0.57–1.24)	0.76 (0.47–1.22)	0.62 (0.32–1.19)
SDQ peer problems			
Normal	Ref	Ref	Ref
Borderline	0.65 (0.42–1.01)	0.59 (0.34–0.99)	0.64 (0.33–1.23)
Abnormal	0.59 (0.39–0.88)	0.51 (0.31–0.86)	0.34 (0.17–0.68)

RESULTS: INDIVIDUAL FACTORS

	Alcohol, tobacco, cannabis Vs Limited-use (ref)	Polysubstance Vs Limited-use (ref)	Heavy polysubstance Vs Limited-use (ref)
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RESULTS: FAMILY FACTORS

	Alcohol, tobacco, cannabis Vs Limited-use (ref)	Polysubstance Vs Limited-use (ref)	Heavy polysubstance Vs Limited-use (ref)
Family		aOR (95% CI)	
Household social class			
Professional	Ref	Ref	Ref
Managerial & technical	0.97 (0.63–1.50)	0.83 (0.50–1.38)	1.29 (0.67–2.50)
Non-manual	1.24 (0.74–2.09)	1.16 (0.62–2.16)	2.05 (0.92–4.53)
Manual	1.47 (0.87–2.49)	0.87 (0.46–1.64)	1.58 (0.70–3.58)
Other	1.27 (0.52–3.14)	1.04 (0.39–2.72)	2.33 (0.69–7.86)
Parental education			
3rd level degree	Ref	Ref	Ref
3rd level non-degree	0.61 (0.41–0.91)	0.78 (0.49–1.24)	0.50 (0.28–0.89)
High secondary &/ Tech/Voc	0.60 (0.41–0.88)	0.70 (0.44–1.11)	0.39 (0.22–0.69)
Low secondary	0.41 (0.22–0.76)	0.74 (0.37–1.49)	0.20 (0.08–0.52)
Household structure			
Two-parent	Ref	Ref	Ref
One-parent	0.94 (0.55–1.60)	1.35 (0.77–2.39)	0.86 (0.43–1.71)
Familial AUD/drug-use			
Not reported	Ref	Ref	Ref
Yes	2.15 (1.19–3.89)	2.45 (1.26–4.74)	3.79 (1.89–7.62)

RESULTS: FAMILY FACTORS

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RESULTS: SOCIO-ENVIRONMENTAL FACTORS

	Alcohol, tobacco, cannabis Vs Limited-use (ref)	Polysubstance Vs Limited-use (ref)	Heavy polysubstance Vs Limited-use (ref)
Social		aOR (95% CI)	
Peer cannabis use			
No	Ref	Ref	Ref
Yes	3.14 (2.29–4.32)	6.67 (4.51–9.86)	13.50 (6.25–29.18)
Environmental			
Neighbourhood substance use			
Not common	Ref	Ref	Ref
Common	0.75 (0.44–1.25)	0.81 (0.45–1.43)	0.67 (0.28–1.58)
Non-parental address at age 20			
No	Ref	Ref	Ref
Yes	1.75 (1.26–2.45)	1.94 (1.30–2.91)	2.32 (1.40–3.84)
Household region at age 20			
Outside Dublin	Ref	Ref	Ref
Dublin	1.03 (0.71–1.50)	1.31 (0.85–2.02)	1.94 (1.14–3.33)

RESULTS: SOCIO-ENVIRONMENTAL FACTORS

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Household region at age 20			
Outside Dublin	Ref	Ref	
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RESULTS: PEER CANNABIS USE IN MORE DETAIL

Unweighted and weighted descriptive statistics for peer cannabis use at 17 years old and its association with latent class membership at 20 years old estimated using weighted multivariable* logistic regression models (N=4644)

	Unweighted	Weighted	Alcohol, tobacco, cannabis Vs. Limited use (ref)	Polysubstance Vs. Limited use (ref)	Heavy polysubstance Vs. Limited use (ref)
	N (%)		aOR (95% CI)		
Peer cannabis use					
None	1956 (42.12)	2030 (43.70)	Ref	Ref	Ref
A few	1381 (29.74)	1298 (27.94)	2.37 (1.69–3.33)	4.28 (2.80–6.54)	6.11 (2.64–14.12)
Some	792 (17.05)	753 (16.22)	4.50 (2.55–8.28)	8.64 (4.82–15.48)	15.92 (6.26–40.51)
Most/All**	515 (11.09)	564 (12.14)	9.45 (3.01–29.66)	35.01 (11.69–104.88)	105.29 (27.79–398.92)

FOOTNOTE

ATC = alcohol, tobacco and cannabis.

*Multivariable models were adjusted for all the same factors as in the main paper

**"Most" and "All" categories were collapsed due to issues with implausible odds ratios that were felt likely to reflect small N in "All" category old (Wave 3). Only 87 (1.87%, unweighted) / 102 (2.20%, weighted)reported that "All" their friends used cannabis at 17 years old

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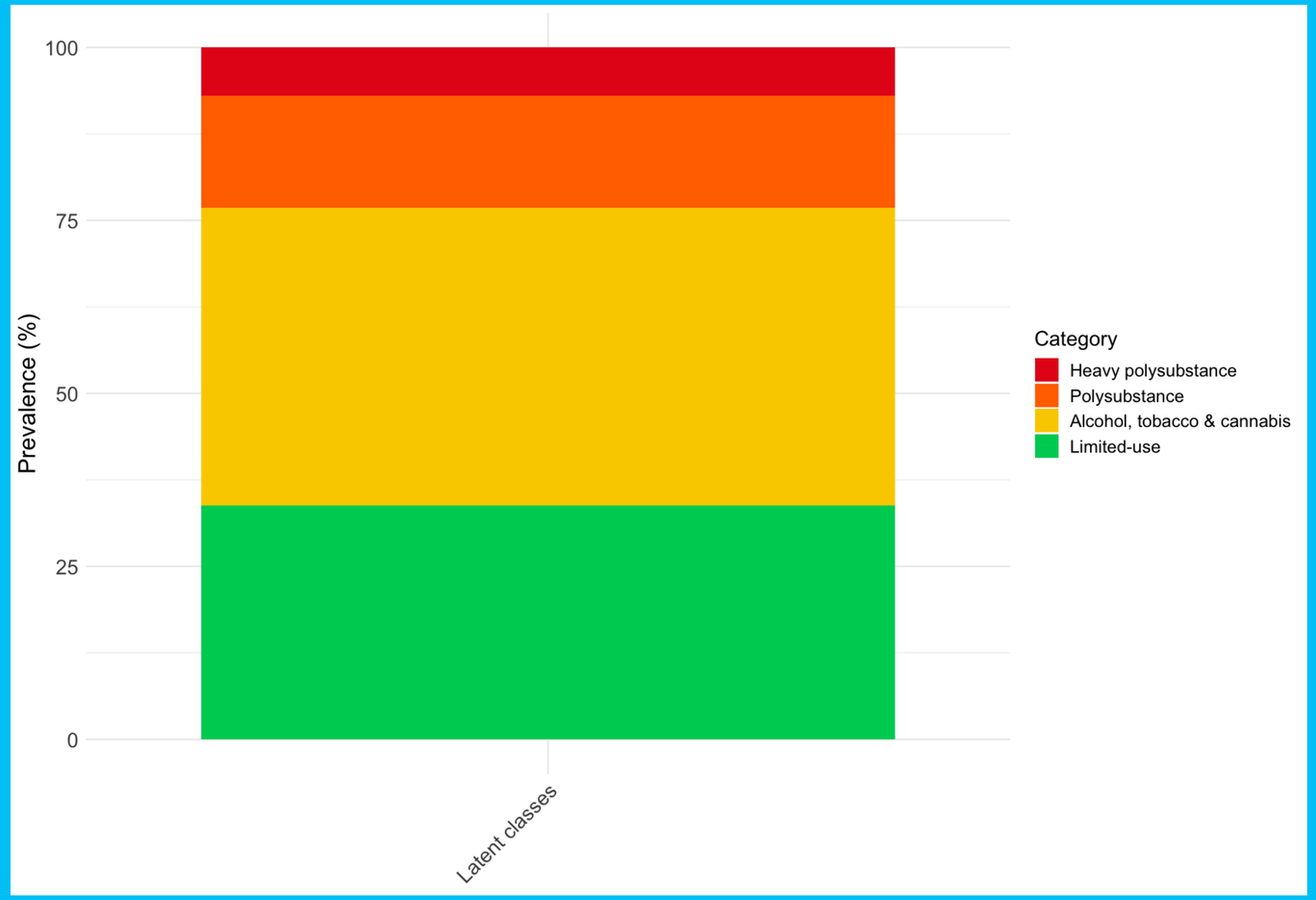
DISCUSSION

We estimate that nearly a quarter of 20-year-olds in Ireland are polysubstance users

Higher than international estimates (although varied methods used)

Strong associations with early alcohol use, peer cannabis use and familial substance use.



STRENGTHS

Policy-relevant research gap

Use of LCA to identify distinct groups of substance users

Identification of longitudinal predictors

Large, nationally representative sample

LIMITATIONS

Inter-wave attrition - adjusted for using provided survey weights

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POLICY IMPLICATIONS

Estimated scale and pattern of polysubstance use at 20 years old highlights the need for action

Individual, family & socio-environmental predictors guide potential interventions in childhood and early adolescent years

ACKNOWLEDGEMENTS

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Thanks to the Health Research Board for funding this work.

Thanks to all my co-authors

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