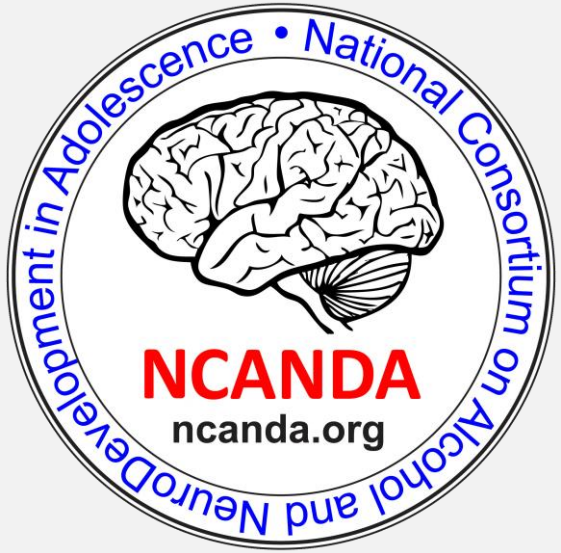
NATIONAL CONSORTIUM ON ALCOHOL & NEURODEVELOPMENT IN ADOLESCENCE

Directors: Sandra A. Brown

& Susan Tapert

DAR Directors: Adolf Pfefferbaum

& Kilian Pohl



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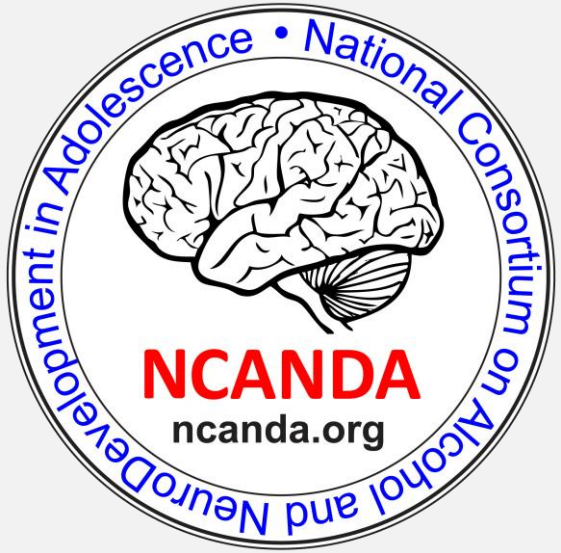

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NCANDA ORGANIZATIONAL STRUCTURE

Administrative Resource
MPI: Sandra Brown (Coordinator) & Susan Tapert
Associate Directors: Bonnie Nagel & Duncan Clark
Marc Schuckit, Ty Brumback, Patrick Mercier, Kara Bagot

Committees
Workgroups
SOPs

Data Resource
MPI: Adolf Pfefferbaum & Kilian Pohl
Edith Sullivan, Rosemary Fama, Eric Peterson,
Wesley Thompson, Dongjin Kwon, Eva Müller-Oehring

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Chair: Sandra Brown
Duncan Clark, Ian Colrain, Michael De Bellis, Bonnie Nagel, Adolf Pfefferbaum, Edith Sullivan, Susan Tapert, Ben Xu

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PI: Duncan Clark
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Chris Martin,
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SRI
MPI: Fiona Baker & Ian Colrain
Massimiliano de Zambotti,
Devin Prouty

UC San Diego
PI: Susan Tapert
Ty Brumback,
Tom Liu

NCANDA AIMS

1. Effects of alcohol on neurodevelopment trajectories
2. Effects of timing, dose, duration on brain development
3. Malleability of effects with abstinence
4. Biopsychosocial factors and neurodevelopment
   - Sex
   - Puberty
   - Family history alcoholism
   - Trauma
   - Sleep

5. Risk, protective & resilience factors of addiction & psychopathology
6. Implications for education, prevention and intervention

ACCOMPLISHMENTS

- Targeted sample **recruitment & follow up** — transitioning into and through high risk age (sufficient use rates)
- **Accessible data bases** – open science model
- High quality, stable **support staff**
- Rigorous **training and fidelity** assurance (multiple site visits)
- **Productive:** 17 publications, 23 presentations & 21 trainees
- Interface with other **large scale efforts** (NADIA; COGA)
- Emerging **new findings** and separate **practice effects** from **developmental neuropsych effects** with our age range
- **Multisite measurement, methods and analytic advances**

DESIGN FEATURES

- **Accelerated longitudinal** design
- **Replicability** of science:
  - Each specialty projects at 2+ sites
  - Each MRI platform (GE, Siemens) at 2+ sites
- **Developmental hypotheses**
- **Scientific and clinical expertise and experience** at each site (for emergent issues)
- **Data integration** and **meticulous data hygiene**
- **Quality control** & **results based accountability metrics**: Standardized battery, training, protocol, measurement, ongoing monitoring (Annual site review/ human phantom visits)

NCANDA RECRUITMENT

Enriched sample

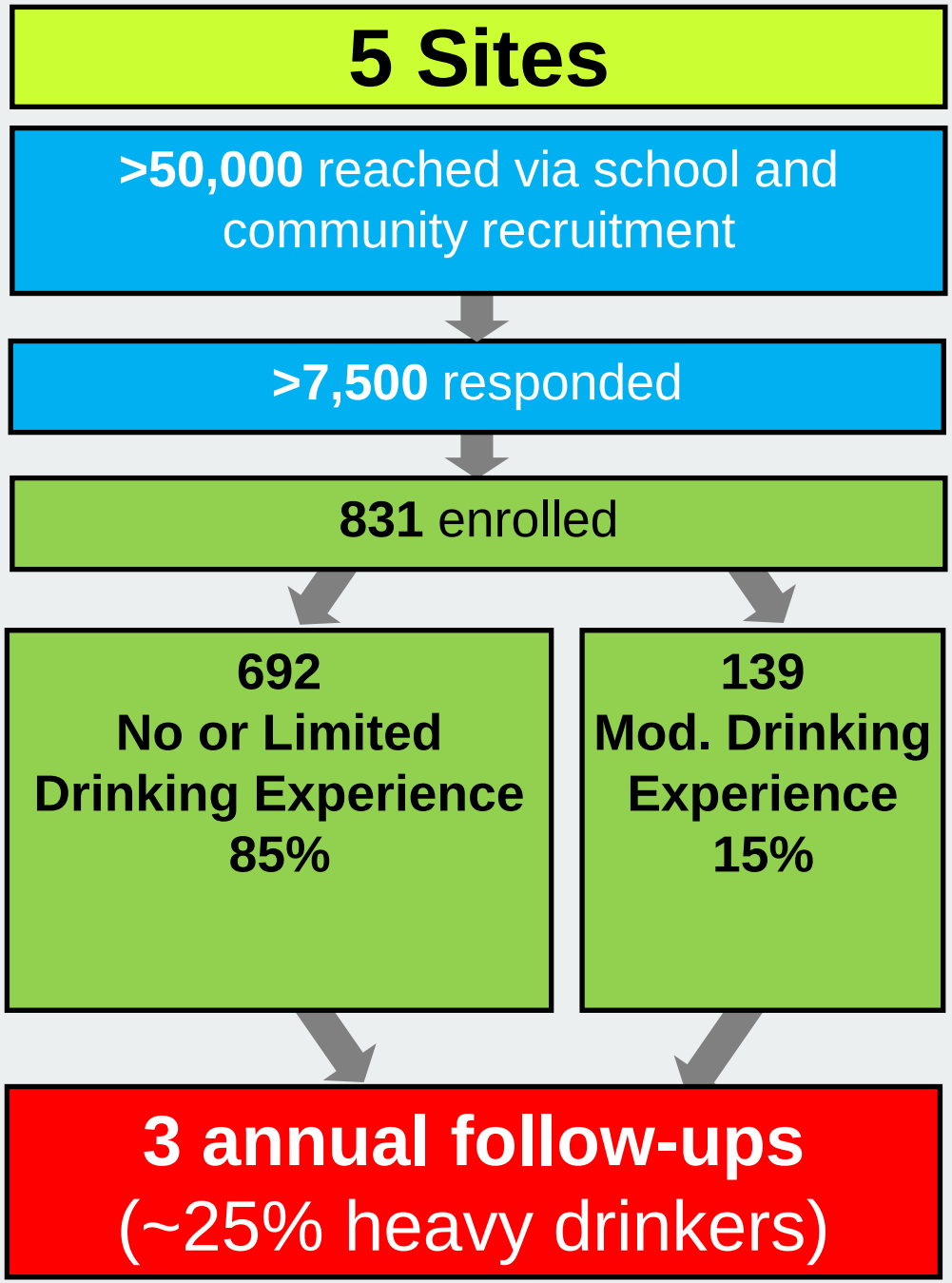
2500 screened-1400 eligible-831 selected

Major risk factors:

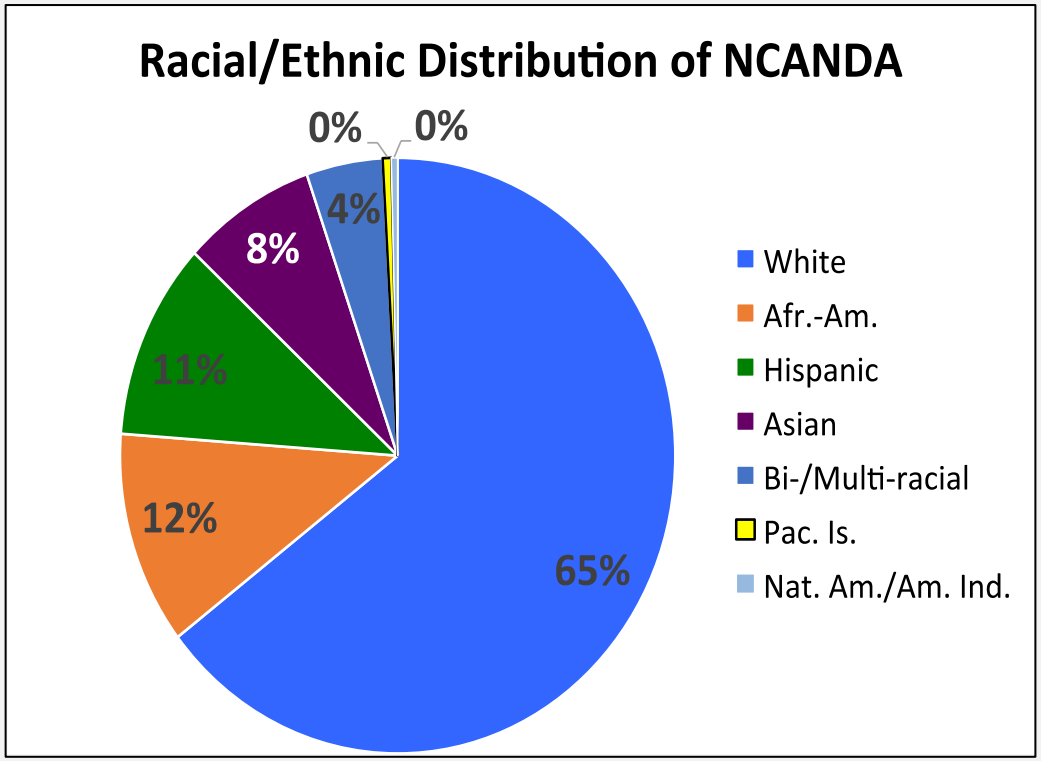
1. FH alcohol use disorder
2. 1+ externalizing symptoms
3. 2+ internalizing symptoms
4. First drink < age 15

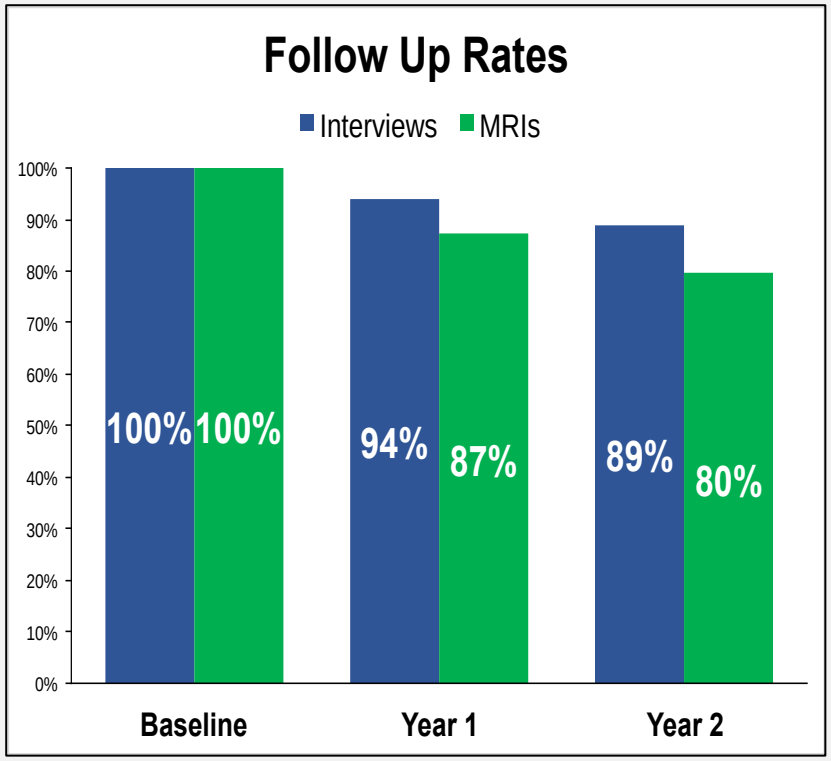
50% endorsed risk

- 30% 1 risk factor
- 20% 2+ risk factors



SUCCESSFUL FOLLOW UP MAINTAINS REPRESENTATIVE SAMPLE

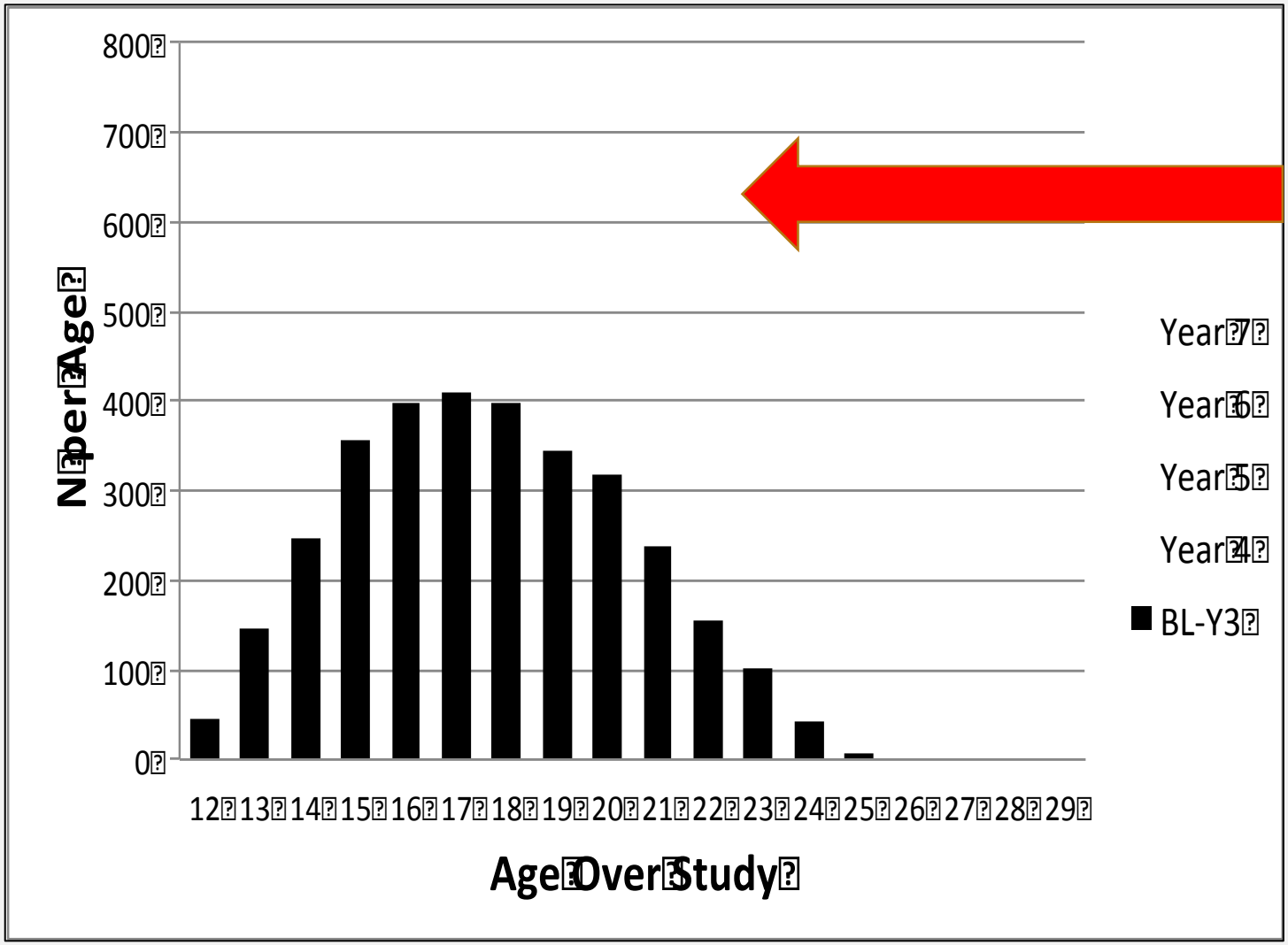




Baseline = Follow up
Demographics = local demographics at sites & Using sample = Non users at baseline
Hi Risk = slightly higher AA & Hispanics

Minimal withdrawals (<3%); equally distributed over demographics and substance use

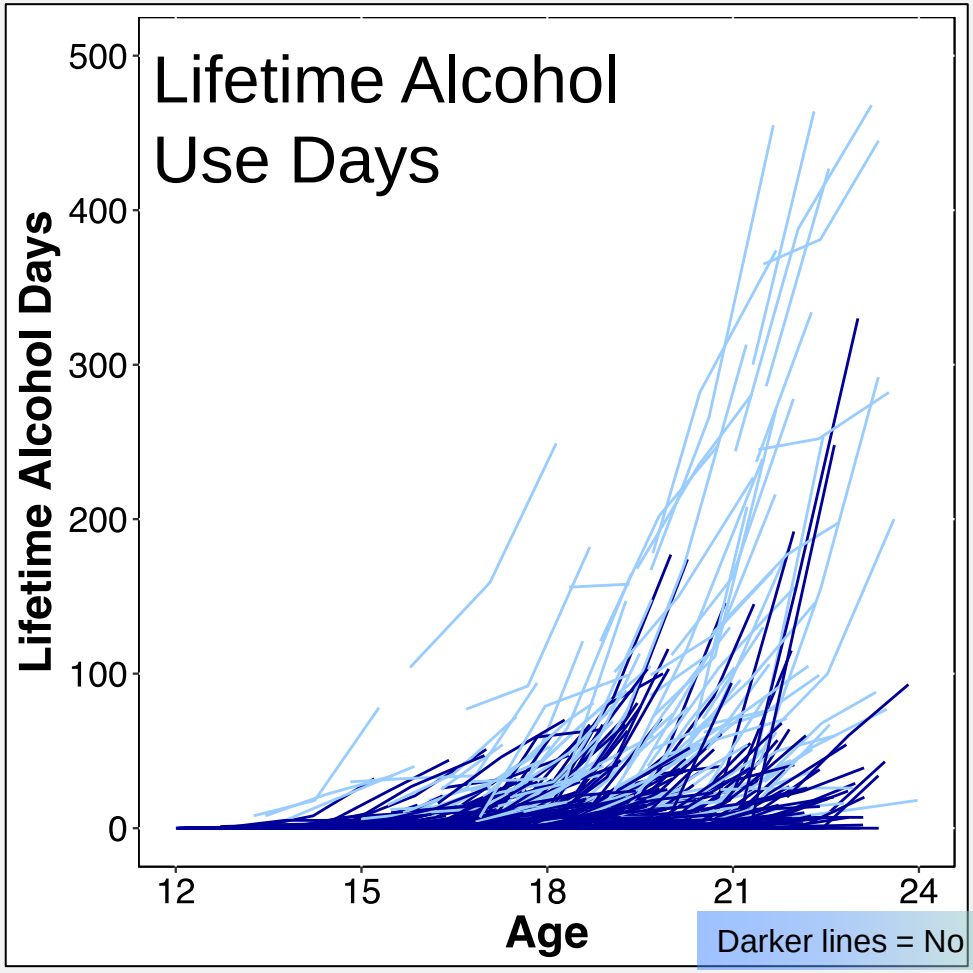
EXPANDING AGE RANGE OF ACCELERATED LONGITUDINAL DESIGN

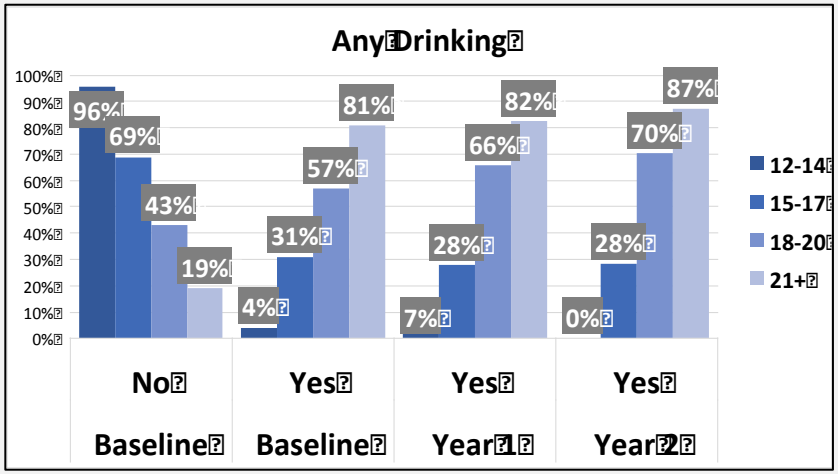


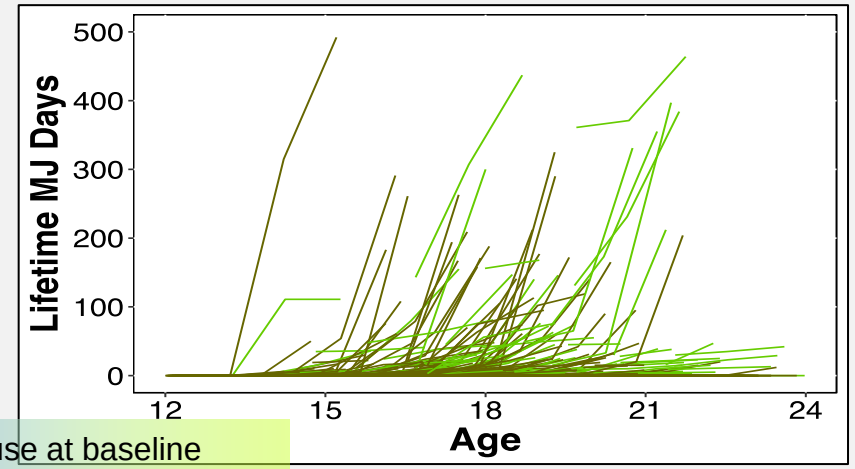
NCANDA2 doubles observations in critical age range

- **Binge**
- **Onset AD**
- **Onset SUD**
- **Onset MH**

ALCOHOL USE, ESCALATION AND CHANGE





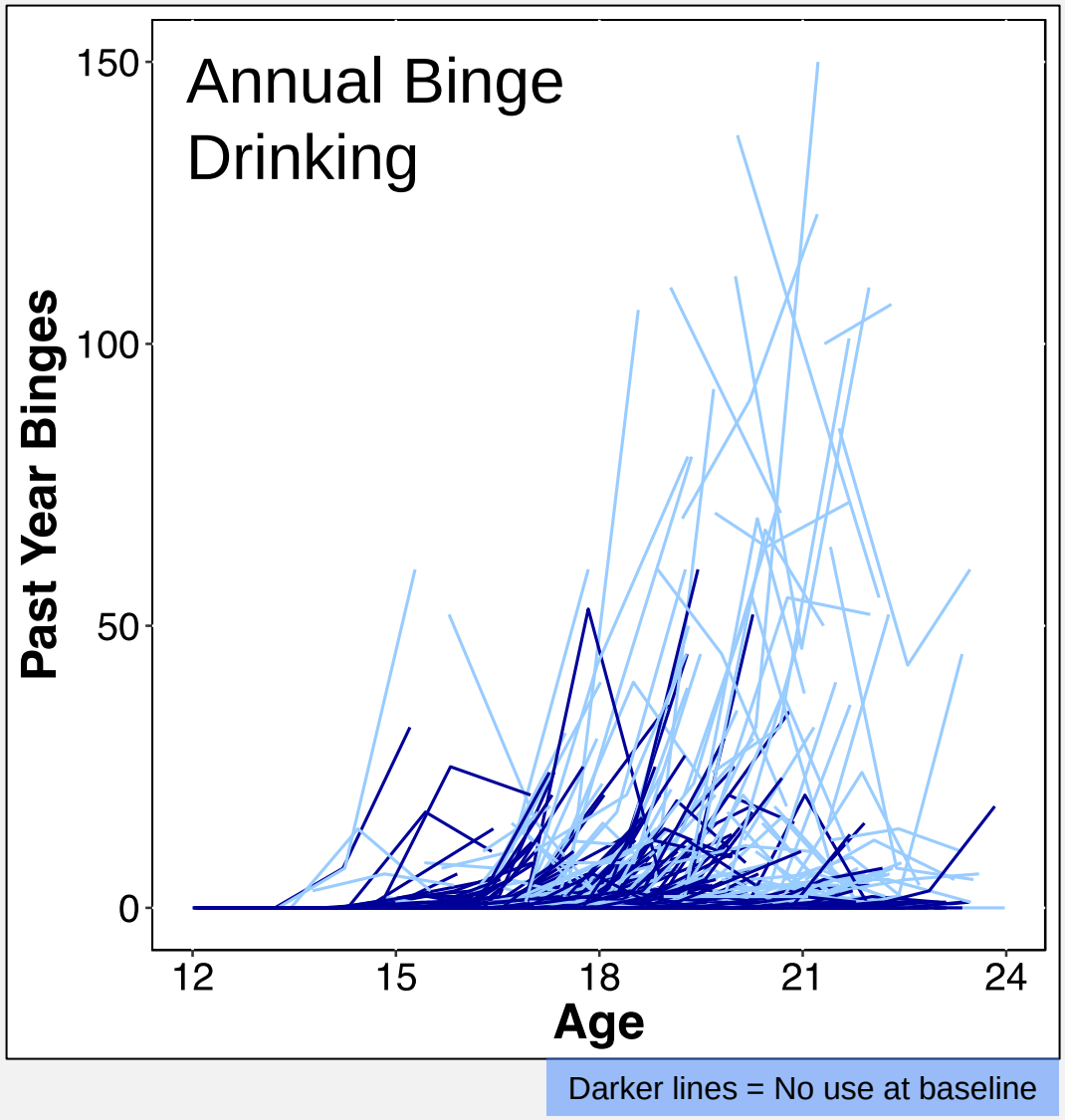


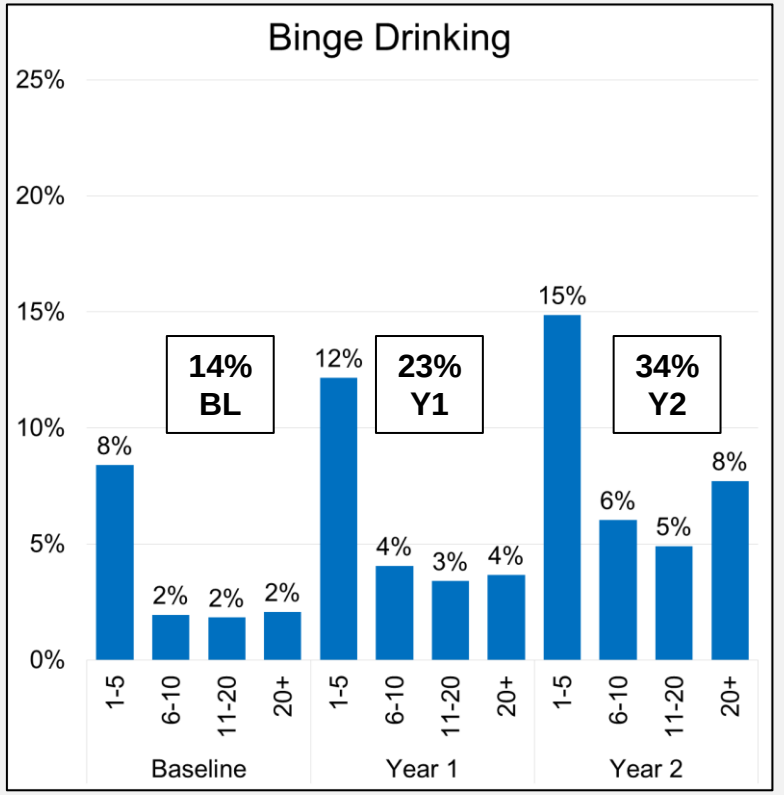
Darker lines = No use at baseline

Substance use increases as anticipated with age, Baseline to Y2:

Nicotine: 12% to 22%	MJ: 19% to 38%
Amphetamines: 1% to 4%	Ecstasy: 1% to 3%

HEAVY EPISODIC DRINKING ONSET INCREASES WITH AGE, VARIES OVER TIME





Overall increased drinking, with individual variation over time:

- 13% had >10 binges at Y2

FUTURE GOALS OF NCANDA2

- Comprehensively assess well described sample of youth through **highest risk period of heavy use** to examine impact of alcohol (other substances) on neurodevelopment
- Address primary aim of evaluating characteristics of alcohol (other drugs) **exposure on brain, cognition, developmental trajectories, outcomes and problems commonly emerging during adolescence**
- Develop **methods and technologies** for more refined imaging metrics and measures of alcohol measurement in the **natural environment** to aid hypothesis driven science

CONTINUED NCANDA EFFORTS

- **Opportunities with this sample:**
  - Aging through highest risk period
  - Expected natural reductions in use levels
- **Analytic opportunities:**
  - Better powered to determine how alcohol and other substance use may alter neurodevelopment
  - Risk profiles – variability in trajectories?
  - Excellent prevention education information