Project 2: EDA

SATs and Drug Use

Project SAT

Project SAT - Background

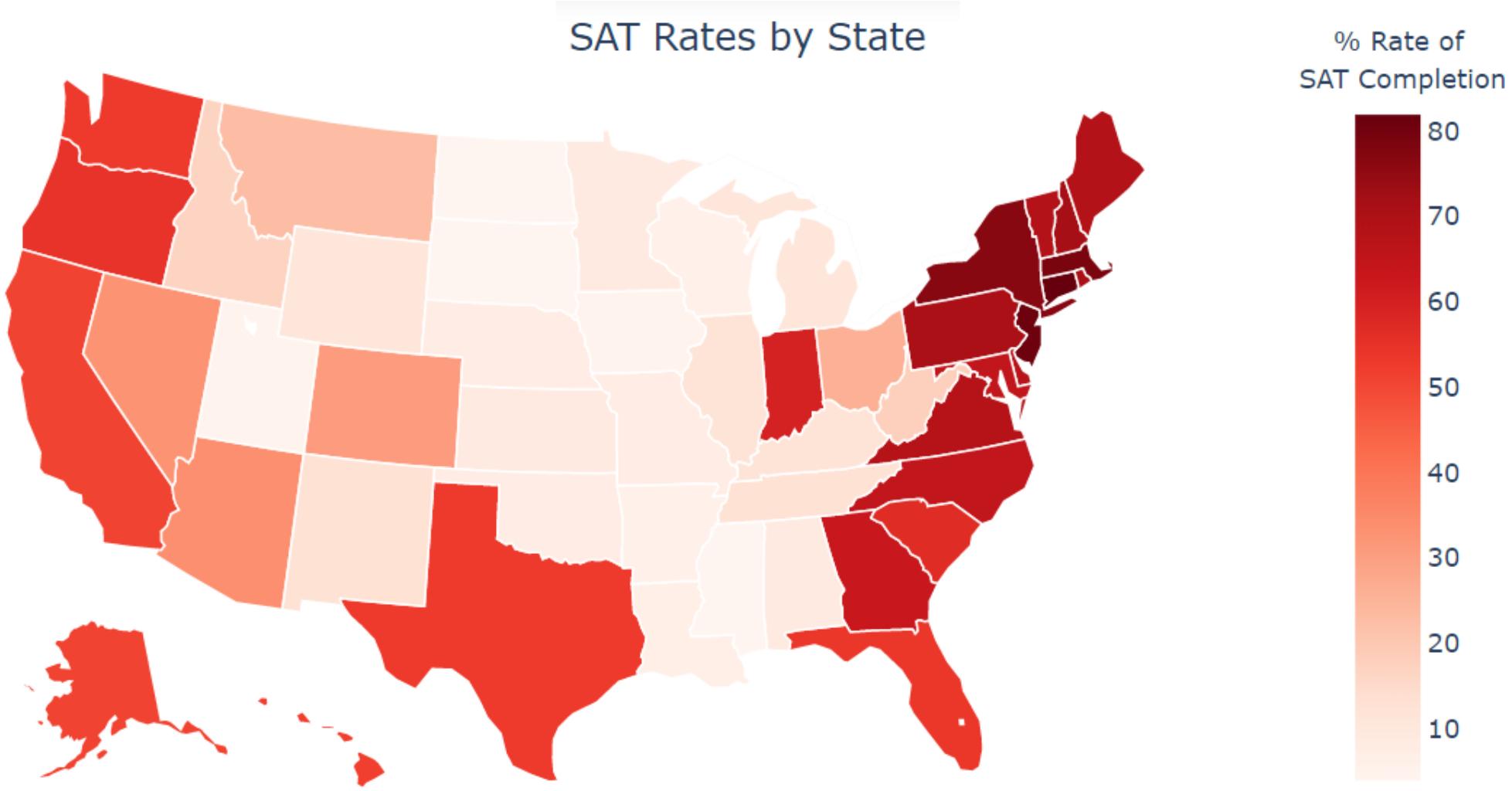
- **Purpose**: provide insights into high school education outcomes

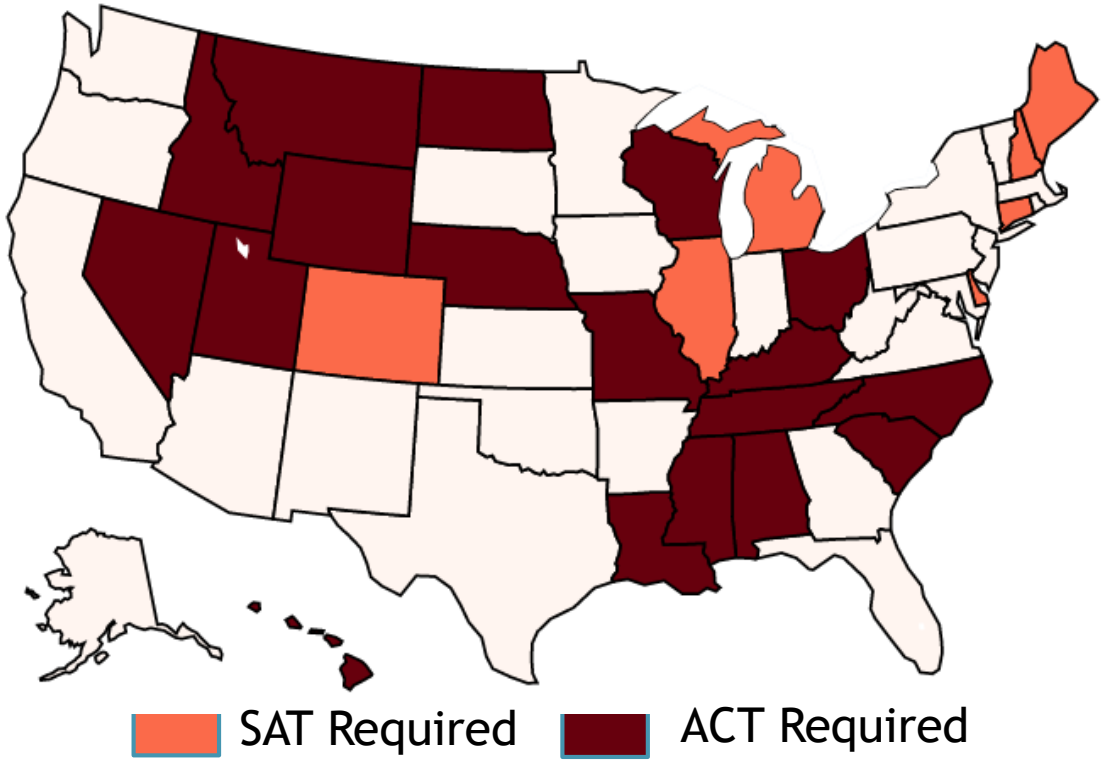
- In this report, we investigate:
  - SAT Completion rate by state
  - Completion rate by state legal requirements to complete SAT
  - Relationship of Math and Verbal sub-scale SAT scores

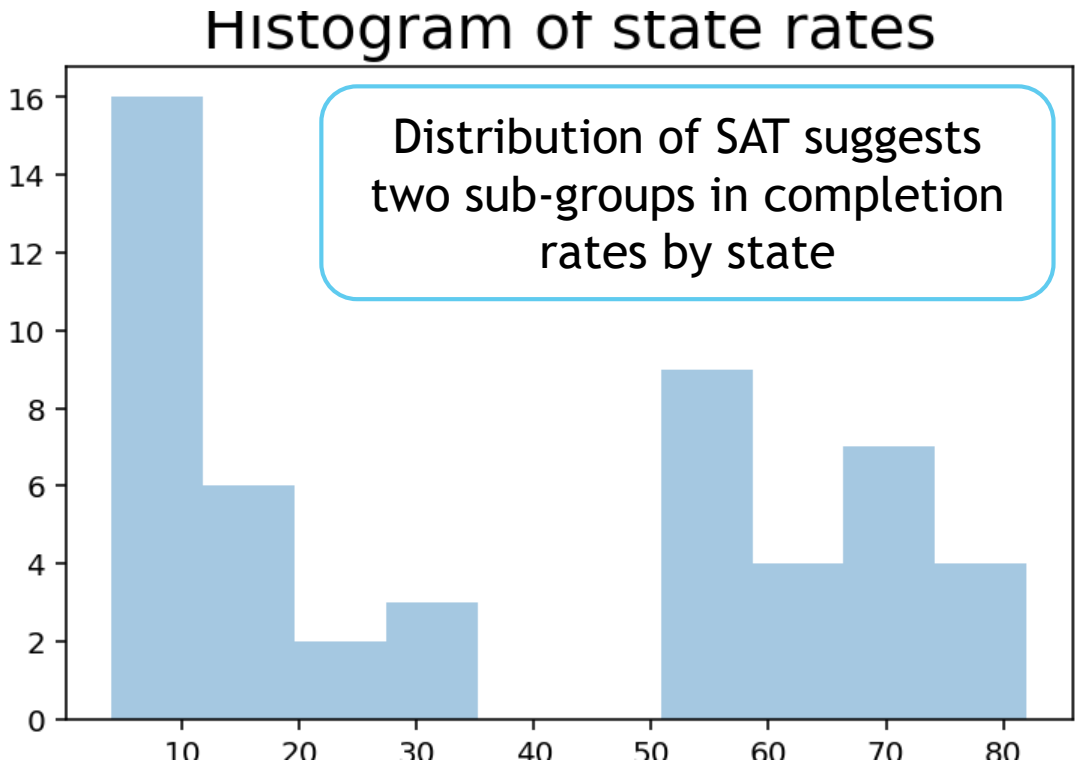
SAT Data Set

- **Each line in data-set represents a US state**
  - Dropping of of ‘All’ for analysis
  - 51 lines (50 states +DC)
- **Data Dictionary**
  - **State**: Contains the 50 states of the US plus DC
  - **Rate**: State completion rate (%) of Scholastic Aptitude Test (SAT)
  - **Verbal**: Median of the Verbal component (of SAT)
  - **Math**: Median of the Math component

The SAT completion rate varies considerably by state with the highest rates observed on the east and west coast states compared to central states

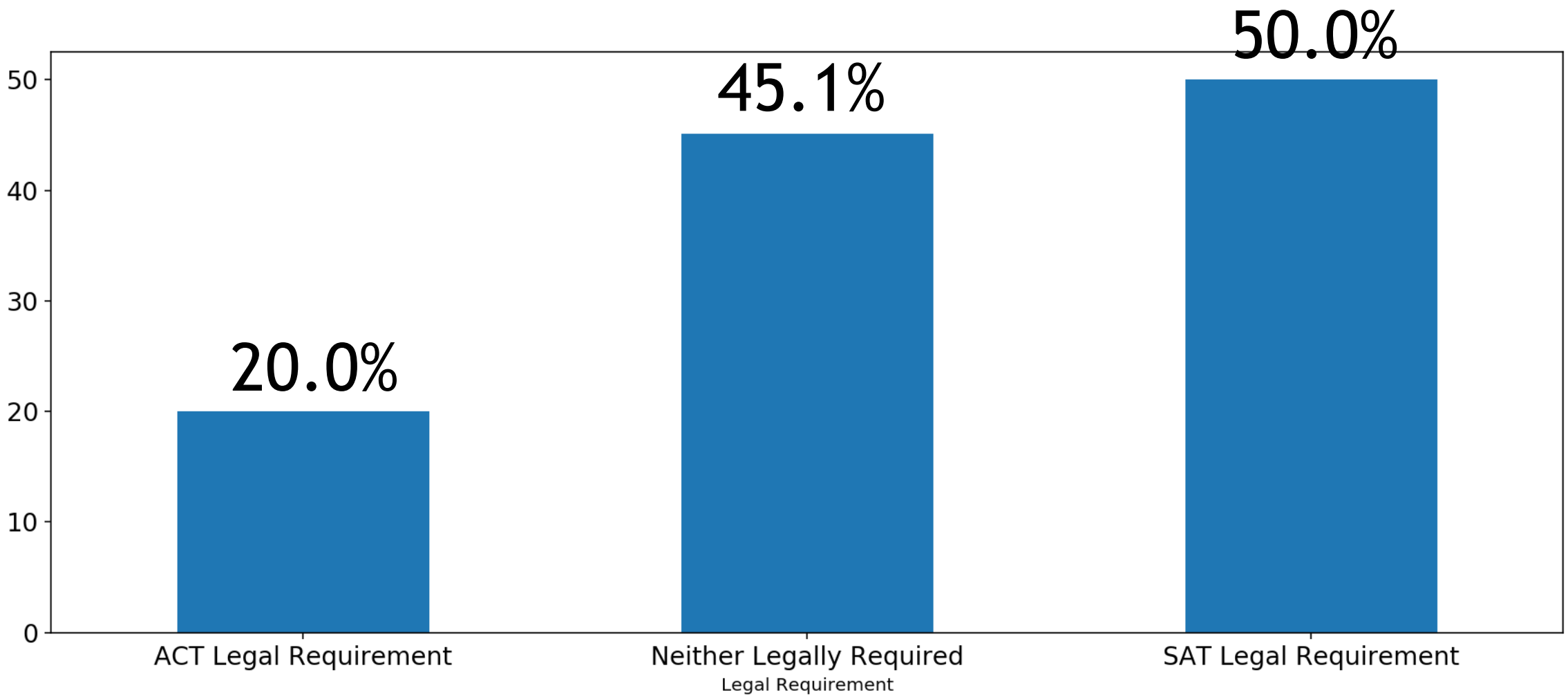






State legal SAT completion requirements a possible contributor to state differences with SAT or American College Testing (ACT) differing between states, although unlikely to be only factor

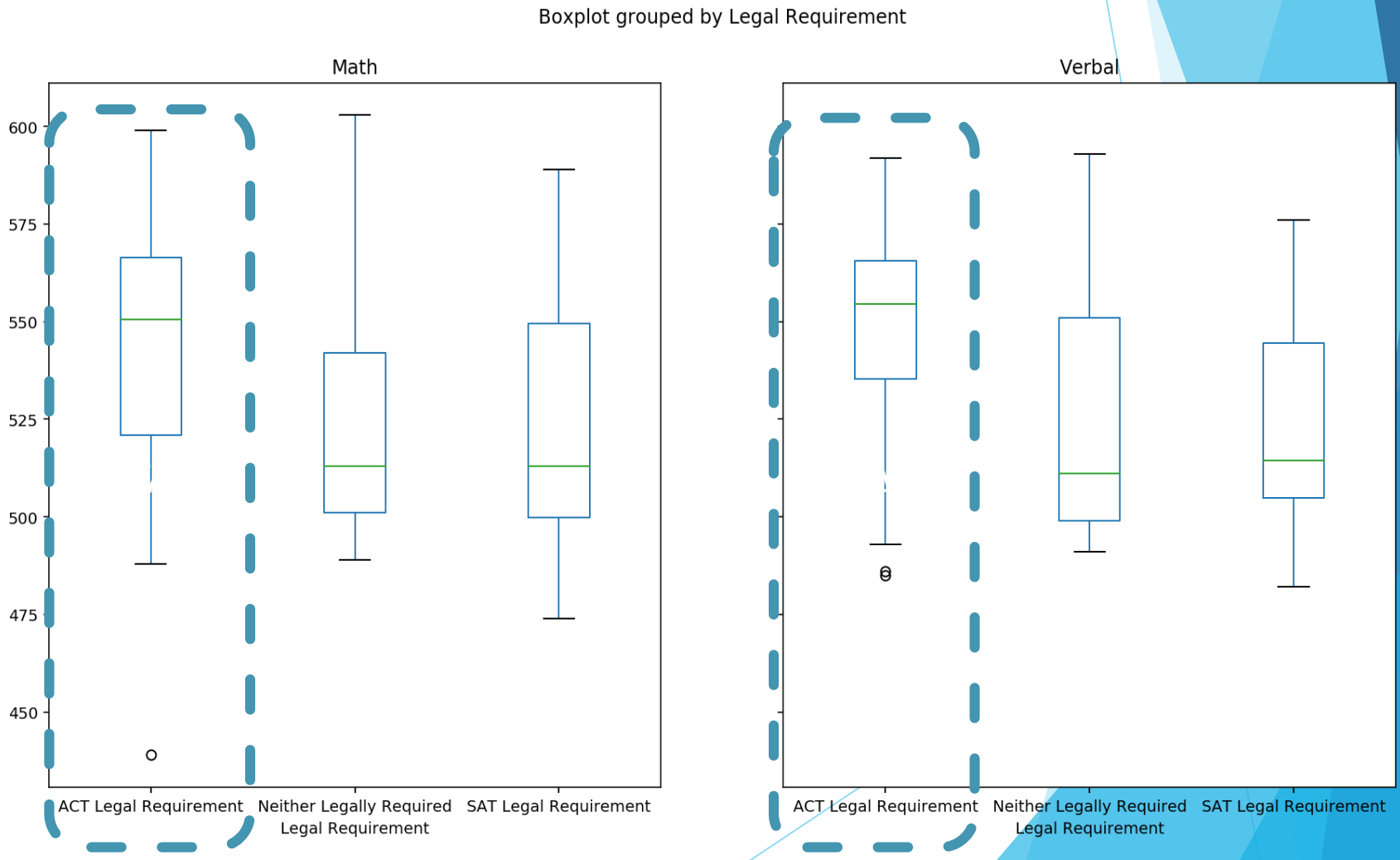
In support, states legally requiring completion of SAT legal show higher completion rates compared to those requiring ACT completion



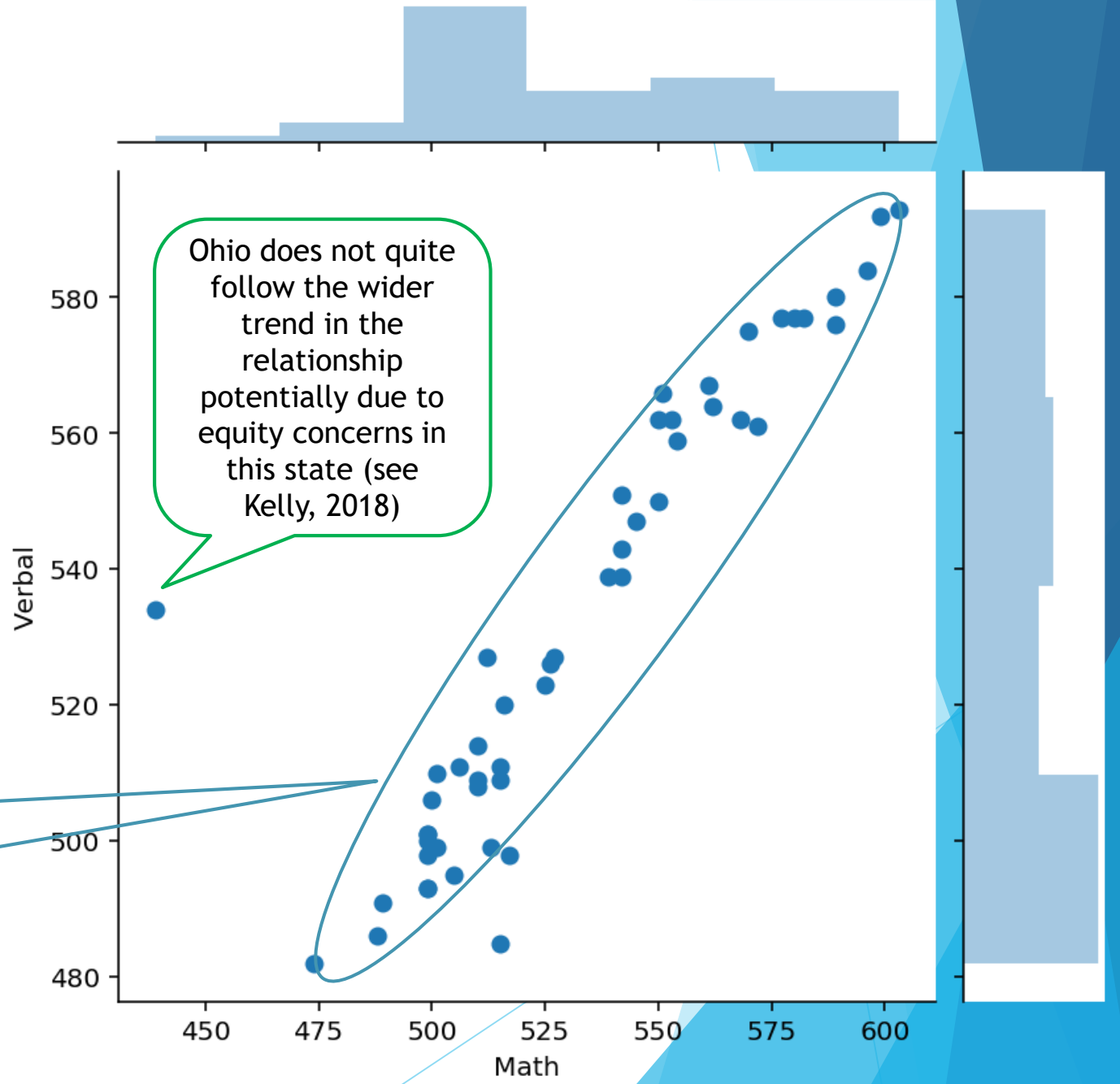
Surprisingly, ACT legal requirement states have higher SAT Math and Verbal SAT scores

Possible explanations

- ACT states are more aligned to SAT requirements possibly due to teaching practices
- Possibility of more specialist schools (e.g. private) in ACT legal states, which also tend to have lower SAT completion rates



States with higher Maths SAT scores also tend to have higher rates of Verbal SAT scores



Scatterplot demonstrates a strong* positive linear relationship between Verbal and Math (*r* = .90)

*Classification of strength based on Cohen (1988); Kelly (2018) https://www.daytondailynews.com/news/historically-low-act-scores-red-flag-for-our-country/djfx9Urp719WyEaMfykyxL/

Summary

- SAT completion rate varies considerably by state with the highest at 82% (CT) to the lowest at 4% (SD, ND, MS)
- State legal requirement for completion of SATs potentially contributes to difference in SAT rates but unlikely to be only contributing factor
- States with legal requirements for ACT have higher median verbal and math SAT scores
- States with higher Maths SAT scores also tend to have higher rates of Verbal SAT scores

Project Drug Use

Project Drug Use - Background

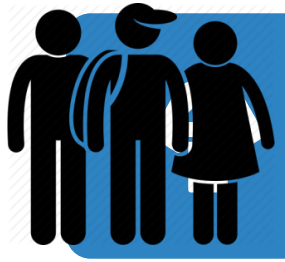
- Purpose of this sub-report is report on research findings

- In this report, **we investigate whether teenagers more likely to use inhalants compared to other age groups**

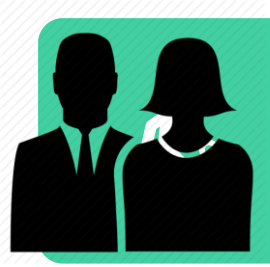
Background & Hypothesis (H_1)

- Inhalants are breathable chemical vapors that can be inhaled to induce a psychoactive or mind-altering effect (National Institute on Drug Abuse, 2012)
- Easy accessibility and relatively low cost may contribute to use by teenagers (Ditmar, 2011)
- Increased financial resources and exposure to other forms of drugs in young adulthood may mean inhalant use reduces as teenagers move into adulthood
- **H_1: Teenagers will have significantly higher rates of inhalant use in the previous 12 months than all other age groups.**

Key Definitions and Data Set



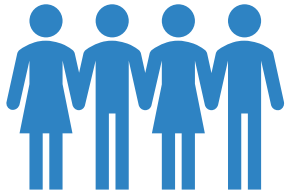
Teenagers: teenagers are defined at those aged 12-17 (inclusive)



Older others: older others are defined at those aged 18+ (inclusive)

Inhalant use: defined as the use of inhalants in preceding 12 month period

Data Set and Analysis Notes



Data Set

-Multiple drug category percentage use by 16 age groups ranging from 12 to 65+

-US based

-Total sample size n = 55,268

- Teenagers n = 17,399
- Older other n = 37,869-

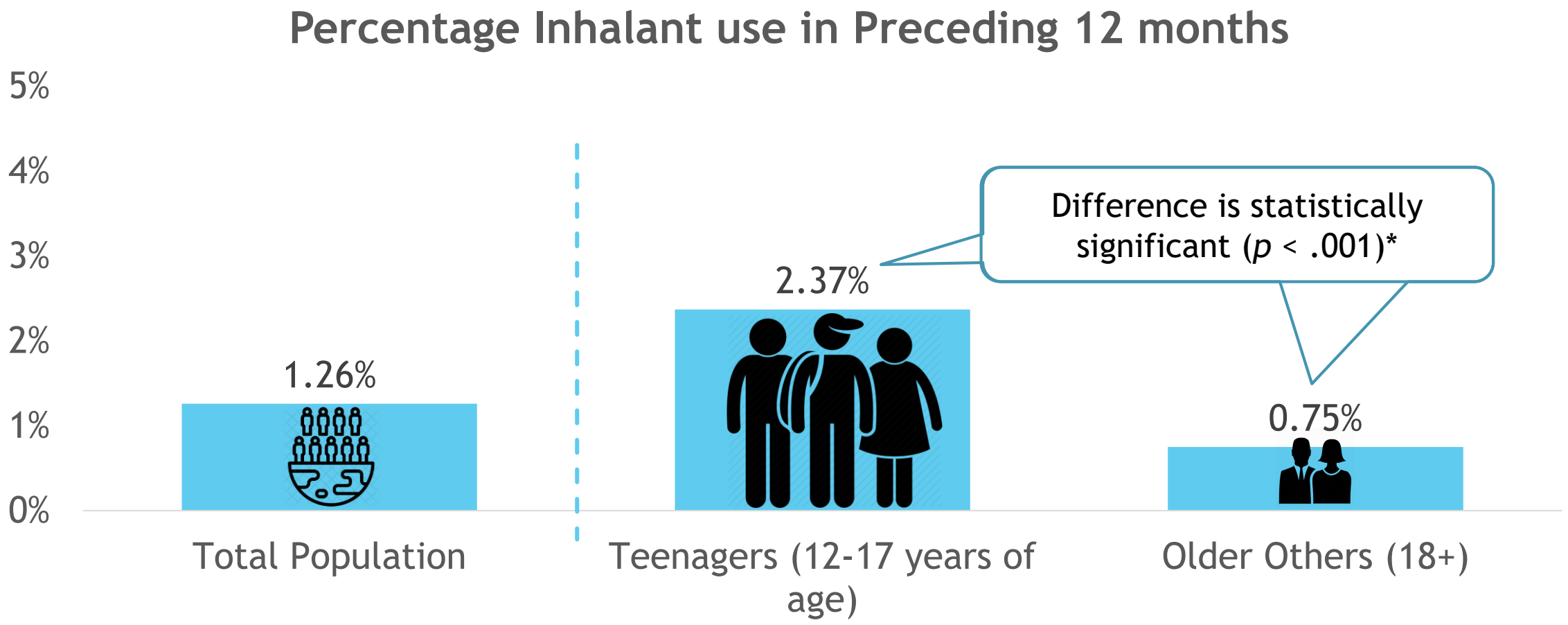
Analysis Notes

-Directional hypothesis so 1-tailed test used

-Alpha level (α) = .05

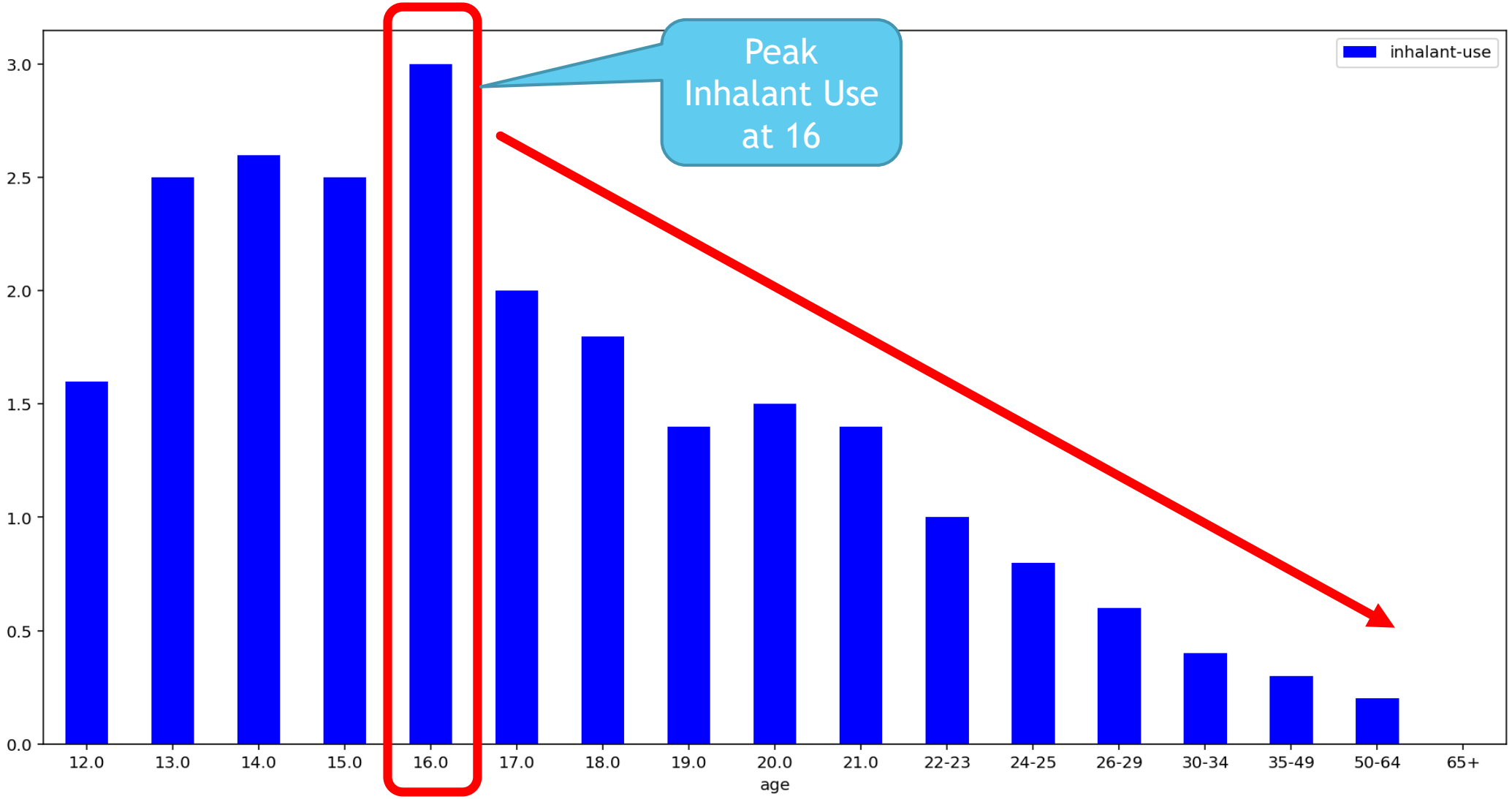
-Assumes random sampling

In the preceding 12 months, overall inhalant usage in the population was low. However, teenagers showed **significantly higher** rates of use compared to older others



*Based on proportion test

Peak inhalant use occur at 16 years of age and declines from this age onwards providing increased support for financial resource and ease of access to alternative drug types



Conclusions

- Teenagers (12-17 years of age) were significantly more likely to have used inhalants (2.37%) compared to those aged 18+ (0.75%)
- Easy accessibility and relatively low cost of inhalants likely to contribute
- While the overall use remains low, there is approximately 23.7 million aged between 12-17 in the US* suggesting that approximately 561,690 teenagers have used an inhalant in the previous 12 months in the US.

*https://www.childstats.gov/americaschildren/tables/pop1.asp

Thank you

Questions?