

Behavioral Risk Factor Surveillance System Survey

A research on E-cigarette Users of D.C. in 2017

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Research Purpose

Why

- E-cig and vaping products first appeared in U.S. more than a decade ago
- Grown Popularity, trending in teenagers, warning signs of an epidemic
- Little to none research on their user base

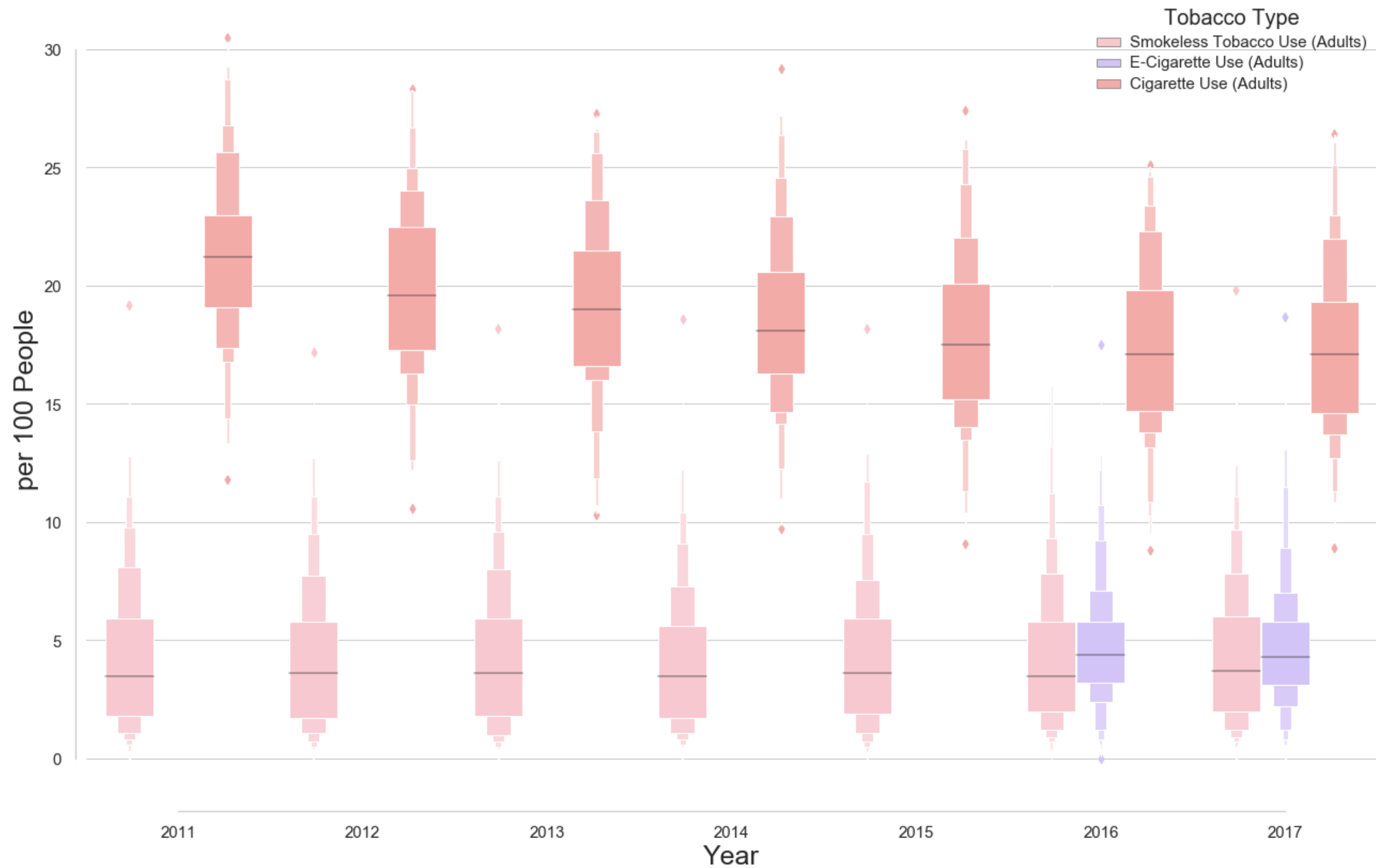
How:

- BRFSS is a continuous, state-based surveillance system that collects information about modifiable risk factors for chronic diseases and other leading causes of death

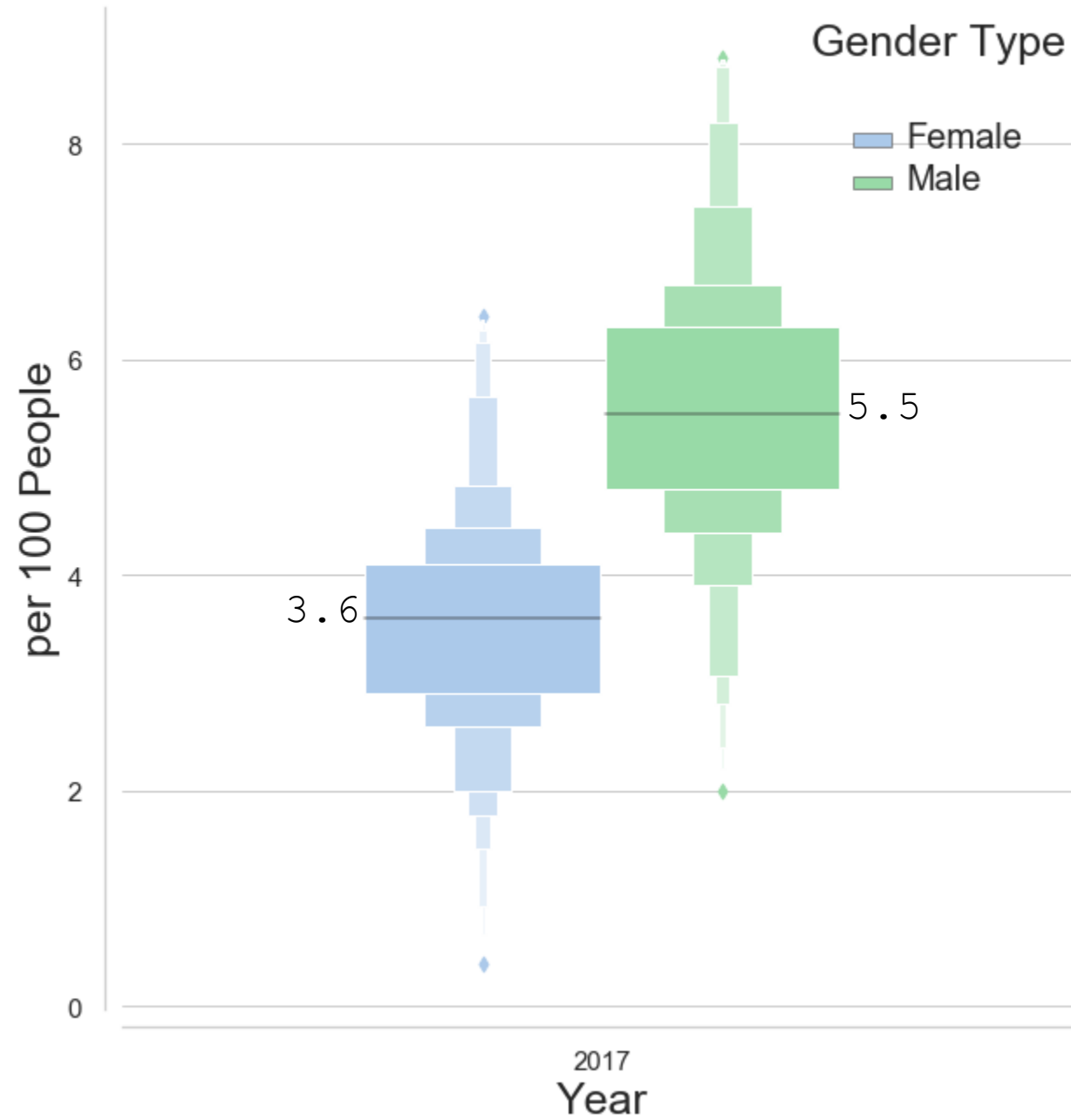
Methodology

- Sample sizes > 50
- For 2011 data and forward, a **random-digit dialing system** was used to select samples of adults in households with landline or cellular telephones.
- Samples: adults from each state who were civilian, aged 18 years or older and not institutionalized.
- Computer-assisted telephone interviewing software
- Data are presented in percentage values
- Due to percentage values, z-score was captured from the comparison of two populations proportions.

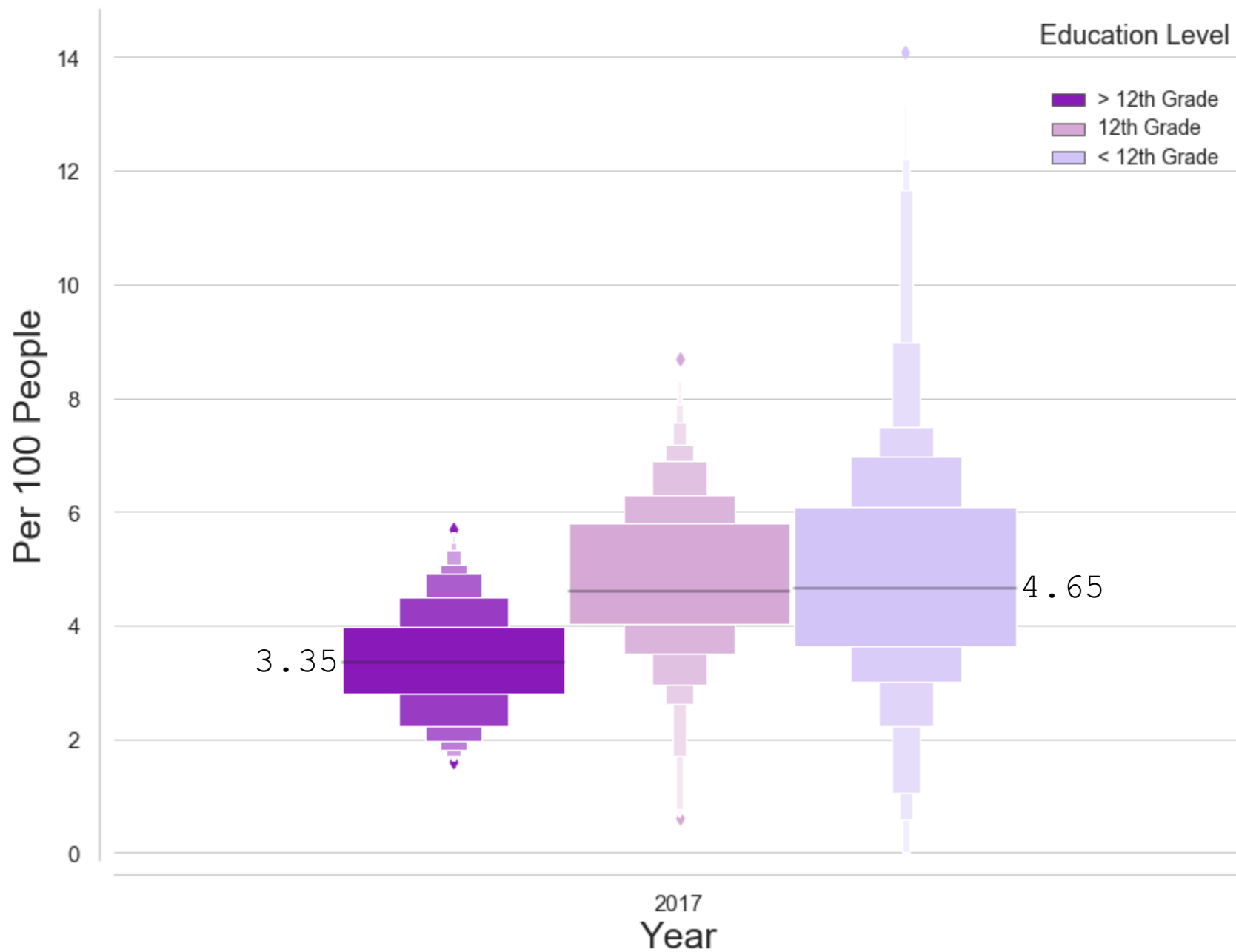
Tobacco Usage Between 2011-2017



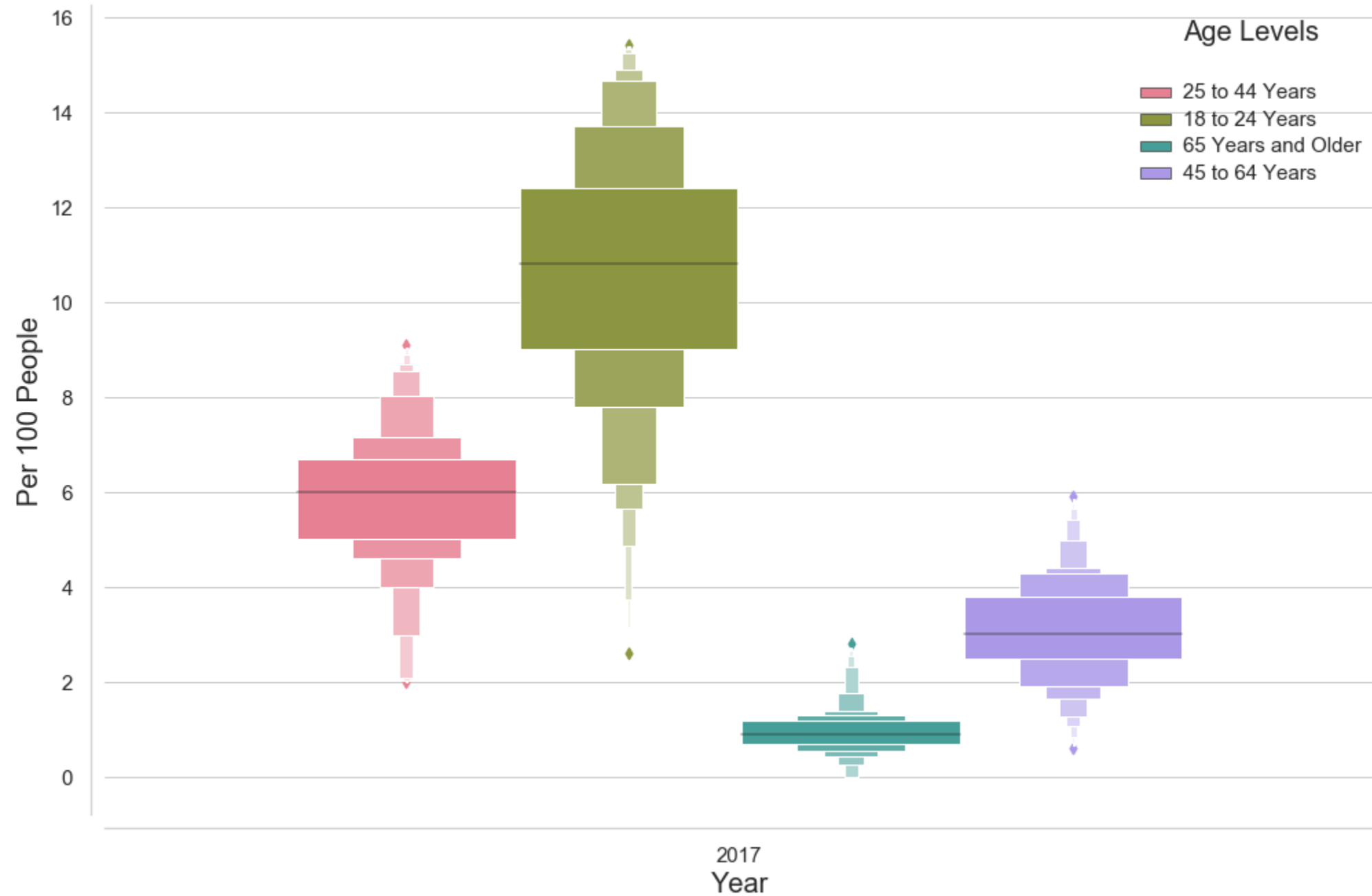
Gender Disparity of E-cigarette Users in U.S. in 2017



Education Level of E-cigarette Users in U.S. in 2017



Age Disparity of E-cigarette Users in U.S. in 2017



2017 – U.S. District of Columbia Population

Hypothesis I

Is there a significant difference between the gender and the proportion of e-cig users in 2017 in DC ?

H0 : Proportion of males and females are equal

H1 : Proportion of males are higher than females

$$H_0 : P_m = P_f$$

$$H_1 : P_m \neq P_f$$

Z-score

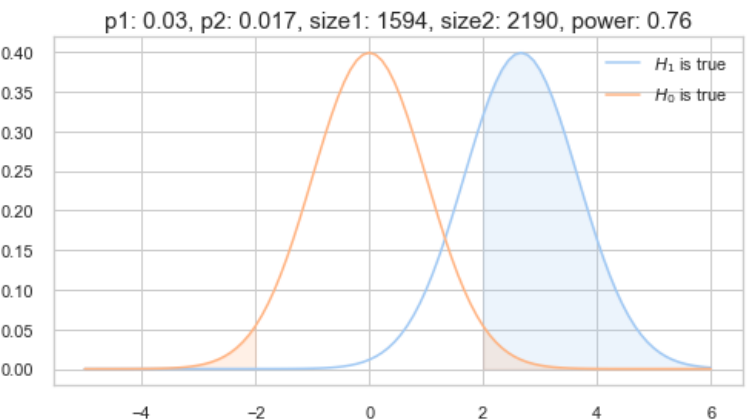
-2.57

p-value

0.010

Result

Reject null hypothesis



$\alpha = 0.05$

Hypothesis II

Is there a significant difference between the age groups of 18-24 and 25-44 with the proportion of e-cig users in 2017 in DC ?

H0 : Proportion of the two age groups are equal

H2 : Proportions are different

$$H_0 : P_y = P_o$$

$$H_2 : P_y \neq P_o$$

Z-score

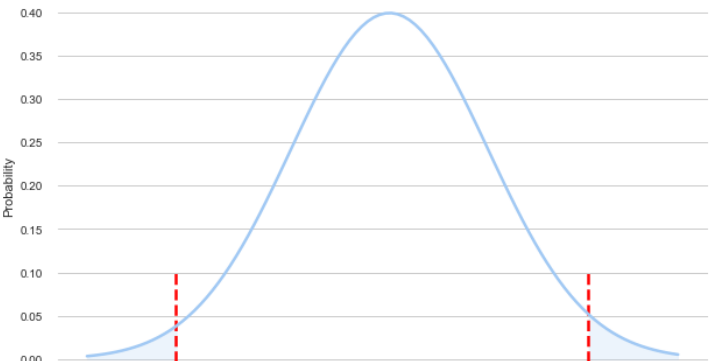
2.956

p-value

0.003

Result

Reject null hypothesis



Hypothesis III

Is there a significant difference between proportion of e-cig users and their education level in 2017 in DC ?

H0 : Proportion of the two education levels are equal

H3 : Proportions are different

$$H_0 : P_h = P_L$$

$$H_3 : P_h \neq P_L$$

Z-score

-2.57

p-value

0.010

Result

Reject null hypothesis

$$Z = \frac{(\hat{p}_A - \hat{p}_B) - (p_A - p_B)}{SE(p_A - p_B)} = \frac{(\hat{p}_A - \hat{p}_B) - 0}{\sqrt{\hat{p}(1 - \hat{p}) \left(\frac{1}{n_A} + \frac{1}{n_B} \right)}}$$

Results

- There are significant disparities in all three categories of gender, age and education.
- In DC in 2017 population, out of every 100 people
 - I. **3** males and **1.7** females have been e-cig users
 - II. **5.8** (18-24 years old) and **2.1** (25-44 years old) have been e-cig users
 - III. **1.6** (higher than 12 year educated) and **3** (less than 12 year educated) were e -cig users

Next Steps

- Analyzing the top states with the highest proportions of e-cig users

Oklahoma > Kentucky > Indiana > Tennessee > Wyoming

- Comparison between regulated states and not regulated ones
- Analyzing the trends in 2018 and 2019
- Comparison of data from other sources with other categorical factors such as:
Income, Employment, Ethnicities