**Planning Document**

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Sections:

* Darth Vapor
* Above or Under the Influence?
  + Shalin
  + Han**eu**l :(
  + Matt
* Ripples

**Darth Vapor**

Build a mathematical model that predicts the spread of nicotine use due to vaping over the next 10 years

1. SIS Model
   1. S(t): Number of susceptible people
      1. Everyone who’s not infected
   2. I(t): Number of people infected (**solve for this**)
      1. Some initial value
   3. Beta: Infection rate
      1. **The hard part**
   4. Gamma: Recovery rate (1/D, D=duration)
   5. N=S+I=total number of people
      1. Figure out what population we’re looking at then subtract for S\_0
   6. R\_0 = Beta \* S / Gamma = number of secondary infections caused by a single primary infection

..., where the edge weights correspond to the likelihood that person A will influence B. These influence weights were calculated using a study done by **icpsr.umich.edu**, in which participants answered questions relating to drug use and health. The responses to the following questions were analyzed:

Have you ever smoked a cigarette?

If your best friend offered you a cigarette, would you smoke the cigarette?

How old are you?

From this data, probabilities that an individual would be influence by peers into vaping as a function of the individual’s age were calculated. These probabilities were then applied to the graph and time was simulated and good shit happened we’re dope we’re hot we’re winners give us money

**Above or Under the Influence?**

* General
  + <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1446419/pdf/11111260.pdf>
* Sleep
  + <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4331208/>
  + <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1868672/>

Format:

* Category
  + Title
  + Original
  + Wave 1
  + Wave 4

c("ID", "Income", "White", "Black/AA", "American Indian", "Asian", "Other", "Birth date", "Work", "Mother", "Father", "Geography")

c("ID", "Income", "Gender", "Birth date", "Work", "Mother", "Father", "Geography")

**Codes for data**

* Income
  + TOT FAM INCOME:
  + IRFAMIN3
  + PA55
  + H4EC1
  + //TOTAL FAMILY INCOME RECODE: INCOME
* Race
  + RACE/HISPANICITY RECODE:
  + NEWRACE2
  + H1GI6(A-E)
* Gender
  + IRSEX
  + BIO\_SEX4
* Age
  + AGE2
  + H1GI1Y
  + H4OD1Y
* Work
  + CATEG THAT BEST DESCR BUSINESS YOU WORK IN:
  + WRKBZCA2
  + H1EE3
  + H4LM1
* Parents
  + VISITED THERAPIST BEC HAD PRBLEMS WITH FAMILY:
  + YUTPFMLY
* Family
  + MOTHER IN HH:
  + IMOTHER
  + H1RM1
  + H4WP13
  + FATHER IN HH:
  + IFATHER
  + H1RF1
  + H4WP27
  + RECORDED # R’S CHILDREN < 18 IN HOUSEHOLD: NRCH17\_2
* Friends
  + HAVE FRIENDS WHO DO NOT SMOKE CIGARETTES: CIGFNSMK
* Geography
  + COUNTY METRO/NONMETRO STATUS (3-LEVEL):
  + COUTYP2
  + H1IR12
  + H4EO6
* High school drug use
  + //ALCEVER
  + AGE WHEN FIRST DRANK ALCOHOLIC BEVERAGE: ALCTRY
  + ALCYRTOT
  + //CIGEVER
  + CIGTRY
  + CIG30USE
  + MJAGE
  + MJYRTOT
  + HERAGE
  + HERYRTOT
  + PERCTYLX
  + VICOLOR
  + ANLCARD
  + ANLYRTOT

**Original codes for data**

* Income
  + TOT FAM INCOME: IRFAMIN3
* Race
  + RACE/HISPANICITY RECODE: NEWRACE2
* Gender
  + IRSEX
* Age
  + AGE2
* Work
  + CATEG THAT BEST DESCR BUSINESS YOU WORK IN: WRKBZCA2
* Parents
  + VISITED THERAPIST BEC HAD PRBLEMS WITH FAMILY: YUTPFMLY
* Family
  + MOTHER IN HH: IMOTHER
  + FATHER IN HH: IFATHER
  + RECORDED # R’S CHILDREN < 18 IN HOUSEHOLD: NRCH17\_2
* Friends
  + HAVE FRIENDS WHO DO NOT SMOKE CIGARETTES: CIGFNSMK
* Geography
  + COUNTY METRO/NONMETRO STATUS (3-LEVEL): COUTYP2
* High school drug use
  + //ALCEVER
  + AGE WHEN FIRST DRANK ALCOHOLIC BEVERAGE: ALCTRY
  + ALCYRTOT
  + //CIGEVER
  + CIGTRY
  + CIG30USE
  + MJAGE
  + MJYRTOT
  + HERAGE
  + HERYRTOT
  + PERCTYLX
  + VICOLOR
  + ANLCARD
  + ANLYRTOT

@shalin

* Original data from teens
  + Income
  + Race
  + Gender
  + Age
  + Work
  + Parents
  + Family
  + Friends
  + Geography
  + Drug use
* Transition
  + Income
  + Work
  + Geography
* Don’t change (youth)
  + Parents
  + Family
  + Friends
  + Geography

Ripples