AN ANALYSIS OF RISK FACTORS FOR TEEN DATING VIOLENCE

ISIB SYMPOSIUM
JULY 21ST, 2016
BY: JUSTIN DEMONTE AND ELISE NORTHROP
MENTORS: JOE CAVANAUGH & JAVIER FLORES
CONSULTANT: MARIZEN RAMIREZ
OUTLINE

• Introduction
• Youth Risk Behavior Surveillance System (YRBSS)
• Explanatory/Response Variables and Analytic Goals
• Results
• Conclusions
TEEN DATING VIOLENCE

- Occurs between two people in a close relationship
- Can be physical, emotional, or sexual (Injury Prevention and Control, 2016)
- Our project focuses on physical and sexual dating violence
HOW DOES DATING VIOLENCE AFFECT HEALTH?

- Dating violence can affect physical and psychological health throughout life
- Youth who experience dating violence are more likely to:
  - Experience symptoms of depression and anxiety
  - Use tobacco, drugs, and alcohol
  - Exhibit antisocial behaviors
  - Think about suicide
- Youth who experience dating violence in high school are at higher risk of victimization in college (Injury Prevention and Control, 2016)
THE YOUTH RISK BEHAVIOR SURVEILLANCE SYSTEM (YRBSS)

- Consists of national surveys conducted by the CDC every two years since 1991
- Targets 9th through 12th grade students
- Monitors social issues and priority health risk behaviors among teenagers in the United States
- We use a subset comprised of 47,720 students from the 2013 YRBSS
OUTCOME VARIABLES

• Physical Teen Dating Violence:
  • During the past 12 months, how many times did someone you were dating or going out with physically hurt you on purpose?

• Sexual Teen Dating Violence:
  • During the past 12 months, how many times did someone you were dating or going out with force you to do sexual things that you did want to do?

• Either Teen Dating Violence

• Dichotomized by presence or absence of TDV
EXPLANATORY VARIABLES (ORDINAL)

- Number of Sexual Partners in Past 3 Months
  (0, 1, 2, 3, 4, 5, 6+)
- Days Missed School Due to Feeling Unsafe in Past Month
  (0, 1, 2–3, 4–5, 6+)
- Alcohol Use in Past Month (Days)
  (0, 1–2, 3–5, 6–9, 10–19, 20–29, All 30)
- Marijuana Use in Past Month (Times)
  (0, 1–2, 3–9, 10–19, 20–39, 40+)
EXPLANATORY VARIABLES (BINARY)

• Illegal Drug Use in Lifetime
• Electronic Bullying Victimization in Past Year
• Bullying Victimization at School in Past Year
ANALYTIC GOALS

• Use univariable and multivariable logistic regression to characterize the effect of the explanatory variables on the risk of experiencing TDV
  • Examine the odds ratios attributed to each risk factor
  • Observe and rank Bayesian Information Criterion (BIC) values
• Create an R Shiny risk assessment tool encompassing our models to predict the likelihood of an individual experiencing TDV
DIFFERENCES IN BIC VALUES
Between null model and univariable model

<table>
<thead>
<tr>
<th></th>
<th>+ Number of Sex Partners</th>
<th>+ Days Missed School for Safety</th>
<th>+ Illegal Drug Use</th>
<th>+ Alcohol Use</th>
<th>+ Marijuana Use</th>
<th>+ Electronic Bullying Victim</th>
<th>+ Bullying Victim on School Property</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical TDV</td>
<td>96,875.0</td>
<td>52,819.6</td>
<td>58,841.0</td>
<td>78,612.1</td>
<td>50,498.3</td>
<td>99,103.7</td>
<td>59,024.0</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>7</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Sexual TDV</td>
<td>57,988.0</td>
<td>69,962.0</td>
<td>56,710.0</td>
<td>59,744.0</td>
<td>31,483.0</td>
<td>128,998.0</td>
<td>90,463.0</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>3</td>
<td>6</td>
<td>4</td>
<td>7</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Either TDV</td>
<td>84,865.3</td>
<td>71,100.9</td>
<td>79,679.9</td>
<td>74,350.0</td>
<td>47,390.2</td>
<td>153,940.4</td>
<td>100,451.9</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>6</td>
<td>4</td>
<td>5</td>
<td>7</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

KEY:
- >95,000
- 80,000-95,000
- 65,000-80,000
- 50,000-65,000
- <50,000

Ranked by relative strength of risk factor
DIFFERENCES IN BIC VALUES
Between reduced model and full model

<table>
<thead>
<tr>
<th></th>
<th>— Number of Sex Partners</th>
<th>— Days Missed School for Safety</th>
<th>— Illegal Drug Use</th>
<th>— Alcohol Use</th>
<th>— Marijuana Use</th>
<th>— Electronic Bullying Victim</th>
<th>— Bullying Victim on School Property</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical TDV</td>
<td>30,907.4</td>
<td>8,366.4</td>
<td>5,627.9</td>
<td>6,928.0</td>
<td>2,833.0</td>
<td>26,098.4</td>
<td>7,949.0</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>3</td>
<td>6</td>
<td>5</td>
<td>7</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Sexual TDV</td>
<td>11,807.8</td>
<td>15,424.9</td>
<td>11,364.4</td>
<td>3,887.8</td>
<td>599.0</td>
<td>33,764.3</td>
<td>14,553.4</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Either TDV</td>
<td>21,209.6</td>
<td>15,731.5</td>
<td>14,197.9</td>
<td>4,925.3</td>
<td>1,287.5</td>
<td>44,079.8</td>
<td>16,461.0</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

**KEY:**
- >30,000
- 15,000-30,000
- 10,000-15,000
- 5,000-10,000
- 1,000-5,000
- <1,000

Ranked by relative strength of risk factor

Introduction

Dataset

Variables/Goals

Results

Conclusions
Odds Ratios Based on Number of Sex Partners

- Physical TDV
- Sexual TDV
- Either TDV

Number of Sexual Partners in Past 3 Months:
- I have never had sexual intercourse
- I have had sex, but not in the past 3 months
- 1 person
- 2 people
- 3 people
- 4 people
- 5 people
- 6 or more people

Introduction
Dataset
Variables/Goals
Results
Conclusions
Odds Ratios Based on Safety at School

Days Missed School Due to Feeling Unsafe in Past Month

- Physical TDV
- Sexual TDV
- Either TDV
Alcohol Use in Past Month
Marijuana Use in Past Month

Odds Ratios Based on Marijuana Use

- Physical TDV
- Sexual TDV
- Either TDV

Odds Ratio

Marijuana Use in Past Month

Results
# ODDS RATIOS FOR BINARY VARIABLES

<table>
<thead>
<tr>
<th></th>
<th>Electronically Bullied</th>
<th>Bullied at School</th>
<th>Illegal Drug Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical TDV</td>
<td>4.695</td>
<td>3.199</td>
<td>2.972</td>
</tr>
<tr>
<td>Sexual TDV</td>
<td>5.511</td>
<td>3.998</td>
<td>2.823</td>
</tr>
<tr>
<td>Either TDV</td>
<td>5.105</td>
<td>3.534</td>
<td>2.823</td>
</tr>
</tbody>
</table>

## Introduction

- **Dataset**
- **Variables/Goals**
- **Results**
- **Conclusions**
## EXTREME RISK PROFILES

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical TDV</td>
<td>2.25%</td>
<td>89.93%</td>
</tr>
<tr>
<td>Sexual TDV</td>
<td>3.66%</td>
<td>93.16%</td>
</tr>
<tr>
<td>Either TDV</td>
<td>5.21%</td>
<td>96.20%</td>
</tr>
</tbody>
</table>
LIMITATIONS

• Initial sample size: 154,673; Final sample size: 47,720
  • Unlikely that data are missing completely at random
  • Therefore inferences based on a complete case analysis could be biased
• Data self-reported
  • Participation is voluntary and anonymous (Brener et al., 2013)
KEY POINTS

- Baseline prevalence of physical TDV is 10.2% and sexual TDV is 10.8%
- Certain risk factors, especially when expressed together, can dramatically increase risk (e.g. > 90%)
- Our risk assessment application can help assess individual risk of TDV
THANK YOU!

HL131467
REFERENCES

