Objectives

Participants will be able to describe:

- Improvements in indicators of prevalence of alcohol use and cigarette smoking among Florida youth;
- Consequences of increased availability of fentanyl and fentanyl analogs in Florida;
- Changes in the harm caused in recent years by other addictive drugs.
Overview
Part 1

Introduction
I. The Florida Population
II. Youth and Alcohol – Good News
III. Adult Alcohol Use and Abuse
IV. Tobacco/Cigarettes
V. E-cigarettes/Vaping
VI. Cannabis/Marijuana
VII. Synthetic Drugs

Overview
Part 2

VIII. Opioids – bad news
IX. Cocaine
X. Methamphetamine and amphetamines
XI. Benzodiazepines
XII. Emerging drug Issues
XIII. Efforts to combat new and existing drugs of abuse
XIV. References
Introduction

- This report
  - Was built on a foundation of reports produced by Epidemiologist James N. Hall
  - Incorporates new data available as of December 2017
    - 2017 Florida Youth Substance Abuse Survey (FYSAS) (published November 2016)
    - 2016 Medical Examiners Report (published November 2017)

Introduction

- Online sources: Behavioral Risk Surveillance System (BRFSS), Youth Risk Behavior Survey (YRBS), Florida Youth Tobacco Survey (FYTS), National Survey on Drug Use and Health (NSDUH)
I. The Florida Population

I. A state of change

– Growing - closing in on 21 million in 2018*
  • 9%+ increase since 2010 census
  • One of every five born in another nation
  • One of every three born in another state
  • (Floridians born in Florida are a minority.)
– NSDUH >12 county estimates are based on 2014

  – Bureau of Economic and Business Research, 2017

I. The Florida Population

• Primarily coastal except I-4 corridor

• Panhandle least densely populated

• Florida population “pyramid” is not shaped like a pyramid, but not top-heavy with older adults.*

*Bureau of Economic and Business Research
II. Youth and Alcohol

- Long range trend:
  - Decreasing use
  - Lower than the national average
Figure 1: Any Alcohol Use in Past 30 Days among youth aged 12-20 years in the USA and Florida: 2002-2014

Source: National Survey on Drug Use and Health State Data

Figure 2: Binge Alcohol Use in Past 30 Days among youth aged 12-20 years in the USA and Florida: 2002-2014

Source: National Survey on Drug Use and Health State Data
II. Youth and Alcohol

- Long range trend:
  - YRBS shows higher rates than FYSAS but trend is consistent

Figure 3: Comparison of Alcohol Use and Binge Drinking among Florida High School Students as Tracked by the YRBSS and FYSAS
Exhibit 4: Current (past 30-day) any Alcohol Use and Binge Drinking (past two weeks) among Florida Middle School Students: 2004-2017

Note: Binge Drinking rate is on any occasion in past two weeks
Source: Florida Youth Substance Abuse Surveys 2000-2017

II. Youth and Alcohol

Great similarity across Florida’s regions
- Based on 2016 FYSAS data
  - 2017 FYSAS did not allow sub-state estimates
  - 2018 survey will again be at the county level
Figure 5: Current (past 30-day) Alcohol Use Among Florida Middle and High School Students by Managing Entity Regions: 2016

Source: 2016 Florida Youth Substance Abuse Survey

Figure 6: Percent of Florida Middle and High School Students Reporting Binge Alcohol Drinking on at Least One Occasion in the Past Two Weeks by Managing Entity Regions: 2016

Source: 2016 Florida Youth Substance Abuse Survey
Youth Alcohol Concerns

- Excessive drinking still exists among those high school students who drink.
  - 2017 FYSAS showed that one in five Florida high school students who reported any alcohol use in the past month also reported binge drinking in the past two weeks.
  - About one in eight high school students reported at least one occasion of drinking that led to their blacking out.
III. Adult Alcohol Use and Abuse

• More than half of adults in the 2016 BRFSS (52.7%) report one or more drinks in the past 30 days.
  – 59% of men and 47% of women

• BRFSS for 2016 reports that 15.5% of Floridians over 18 (20.1% of men versus 11.3% of women) engage in “binge drinking”

Alcohol Use Disorder

• About 6% of Floridians age 18 and older were classified by the 2016 NSDUH as having “Alcohol Use Disorder.”

• This is defined as meeting the criteria for alcohol dependence or abuse based on definitions found in the 4th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV).
Economic Consequences

- BRFSS provides estimates of the economic cost of excessive drinking to each state. Costs include:
  - losses in workplace productivity (72% of the total cost)
  - health care expenses (11%)
  - other costs due to a combination of criminal justice expenses, motor vehicle crash costs, and property damage.
- The estimate for Florida is a staggering $15.3 billion or $815 per capita.

Alcohol Fatalities

- The 2016 Florida Medical Examiners Commission Report showed that alcohol was detected as being present in 44% of all drug-related deaths in Florida, a 22.2% increase over the 4,270 such occurrences in 2014 and an 11.7% increase over 2015.
- Of the 2016 ethanol cases, 948 or 18% were deaths considered to be caused by alcohol.
IV. Tobacco/Cigarettes

Youth Tobacco Use

• Cigarette use continued to drop in 2017 for both high school and middle school

• Decreases in past decade are remarkable

Figure 8: Current (past 30-day) Cigarette Use among Florida Middle and High School Students: 2006-2017

Source: Florida Youth Substance Abuse Surveys 2006 - 2017
Youth Tobacco Use

- Cigarette use continued to drop in 2017 for both high school and middle school students.

- Unlike alcohol, regional differences in cigarette use are noticeable with highest rates mostly in the northern part of the state.

Figure 9: Current (past 30-day) Cigarette Use Among Florida Middle and High School Students by Managing Entity Regions: 2016

Source: 2016 Florida Youth Substance Abuse Survey
Adult Tobacco Use

• Nationally adult smoking reported in BRFSS surveys has dropped from 20.9% in 2005 to 15.1% in 2015.

• For 2016, 15.5% of adults in Florida reported smoking (17.8% of males and 13.3% of females)

• In 2016 the lowest adult prevalence was in persons aged 65 and over (8.4%) followed closely by the 18-24 age group 11.2% with other age groups roughly twice as likely to be current smokers

V. E-cigarettes/vaping
What are the Issues?

- Initially presented as an exit strategy for cigarettes
- Many young people initiate nicotine use with e-cigarettes
- Wide variety of substances (including illicit) being vaped

What are the Issues?

- Little research or safety studies:
  - Nicotine ultrafine particles can be inhaled deep into the lungs. Particles include flavorants like diacetyl that have been linked to serious lung disease, volatile organic compounds, chemicals known to be carcinogenic such as: formaldehyde, acetaldehyde, lead, nickel, chromium, PM2.5, acrolein, tin, toluene, and aluminum.
  - Possible negative health effects: impaired prefrontal brain development and increased risk of high blood pressure, diabetes, and chronic lung disease. *

* Harvard Health Blog
Youth and e-cigarettes/vaping

- Approximately one in four students surveyed in 2017 FYSAS reports lifetime use of such units.
  - One in eight middle school students versus one in three high school students
- Thirty-day use was lower
  - 4.3% of middle schoolers and 10.1% of high school students
- Notably, rates for use of electronic vaping were higher than those for cigarette smoking.
- Perhaps the most positive finding in this regard is that 30-day use of electronic vaping devices among all students dropped from 9.6% in 2016 to 7.7% in 2017.

![Figure 10: Current (past 30-day) E-Cigarette or Vaporizer Use Among Florida Middle and High School Students by Managing Entity Regions: 2016](source: 2016 Florida Youth Substance Abuse Survey)
Adult Use of E-cigarettes/Vaping

- Adult use of e-cigarettes as reported in the 2016 BRFSS survey showed an inverse correlation with age groups. With each increase in age group use steadily declined.
  - 9.8% of the 18-24 age group
  - 1.4% of the 65 and over age group

- Age effect or cohort effect?

VI. Cannabis/Marijuana

- Changing/ambivalent legal status

- Use by persons ages 12 and older as measured by NSDUH (2016)

- Youth data as reported in FYSAS – is DOWN from levels of 2010-2014 and lowest since 2006
Figure 11: Current (past 30-day) Marijuana Use among Florida Middle and High School Students: 2004-2017

Source: Florida Youth Substance Abuse Surveys 2004 - 2017

Figure 12: Comparison of current (past 30 day) marijuana use among Florida high school students as tracked by the Youth Risk Behavioral Surveillance Survey (YRBSS) and the Florida Youth Substance Abuse Survey (FYSAS)
NSDUH 2015-2016 (Estimates)

- Past Year Marijuana Use ages 12 and older
  - 2014-15 = 12.59
  - 1015-16 = 13.07
  - Past Year Marijuana Use ages 12-17
    - 2014-15 = 13.49
    - 2015-16 = 12.72
  - Past Year Marijuana Use ages 18-25
    - 2014-15 = 32.88
    - 2015-16 = 33.66
  - Past Year Marijuana Use ages 26 and older
    - 2014-15 = 9.57
    - 2015-16 = 10.21

- Age 12+ data shows gradual increase in past 30 day use since low point in 2006-2008

- Greatest use is in the 18-25 age group

- Florida increase is slower than the national increase
Figure 14: Any Marijuana Use in Past 30 Days among persons aged 12 and above in the USA and Florida: 2002 - 2016

Source: National Survey on Drug Use and Health Substate Data
* From 2015-2016 National Survey on Drug Use and Health: Model-Based Prevalence Estimates - Table 3

Cannabis/Marijuana 2018

- Current legal status at federal level is a political issue
- Schedule 1 status makes research on safety and efficacy of medical cannabis difficult or impossible to study
- Long term trend seems to favor wider availability in Florida
  - More states legalizing medical or recreational use since 2015.
  - States with medical marijuana laws show somewhat higher recreational use and lower perceived risk than non-medical marijuana states (Schuermeyer et al, 2014)

BUT

- Does this portend greater youth use?
- More frequent or widespread adult use?
  * We will need data in upcoming years to know.
VII. Synthetic Drugs

- Cannabinoids
- Cathinones

Synthetic Cannabinoids
Synthetic Cannabinoids

- Mimic effects of marijuana
- First legally sold as commercial products with names like "K-2" or "spice"
- Original group of synthetic cannabinoids was banned but have been constantly replaced with an ever-changing list of chemicals
- Use peaked around 2010 and has dropped dramatically with past 30-day levels in 2017 reported on FYSAS less than one-fourth of 2010 levels

Figure 15: Synthetic Cannabinoid Lifetime and Past 30-day Prevalence among Florida high school Students: 2011-2017

Source: Florida Youth Substance Abuse Surveys 2011-2016
Synthetic Cathinones

“Bath Salts”, “Flakka”, “Molly” etc.

• Epidemic of “flakka” (alpha PVP) in Southeast Florida – especially Broward County - in 2015

• Apparent dramatic decrease starting in 2016

• Attempts to circumvent law by reformulating cathinones and other synthetic drugs to allow legal sales.
Figure 16: Synthetic Cathinone Deaths in Florida: Jan 2013 – Dec 2016

Source: Florida Medical Examiners Commission 2016 Final Report

Figure 17: The Changing Face of Synthetic Cathinones in Florida Crime Lab Reports 2010-mid 2016

*Note: The 115 Other Cathinones in 2016 were all N-Ethylpentylone

Source: US DEA - National Forensic Laboratory System Data Queried May 22, 2017
New Tools to Control Synthetic Drugs in Florida

• Florida amended its controlled substance statute in 2017. It now defines a “synthetic” with reference to the similarity of its molecular structures to an illegal drug.

• Law enforcement officials now can prosecute those trying to avoid criminal penalties by selling products that have simply made a small change to a synthetic drug’s molecular structure.

• This should provide a much more rapid means to respond to novel synthetic drugs.

VIII. Opioids

• A national epidemic – growing in Florida
  – Prescribed opioids
  – Diverted prescription opioids
  – Illicitly manufactured/sold prescription opioids
  – Fentanyl
  – Heroin
  – Fentanyl analogs (carfentanil, etc.)
Monitoring Opioid Use/Misuse

- Prescriptions are tracked
- Illicit opioids are not easily monitored
- Annual Medical Examiners Reports on drugs in deceased persons show evidence of:
  - Prevalence of use
  - Prevalence of presumptively lethal use
- Biggest change since last year’s data is growth of deaths related to fentanyl analogs (carfentanil, etc.)

Figure 18: Number of Selected Lethal Opioid Occurrences Among Deceased Persons in Florida 2008 to 2016

Source: FDLE – Drugs Identified in Deceased Persons by Florida Medical Examiners
Jan 2008 - Dec 2016 Reports
Fentanyl

- Fentanyl (Duragesic, Subsys, Abstral, and Ionsys)
  - Extremely potent opioid
  - Legal pain medication – e.g., post surgical pain
  - Lethal dose is minute compared to heroin
  - Illicit fentanyl manufactured in China is a street drug
  - Mixed with/sold as heroin
  - Reportedly found in dilution in other street drugs (e.g. cocaine)

**Figure 19:** Number of Nonmedical Rx Opioids (excluding Fentanyl Analogs) Occurrences Detected among Decedents Florida 2005 – 2016

*Source: FDLE – Drugs Identified In Deceased Persons by Florida Medical Examiners Annual Reports 2005 – 2016*
### Table 1: Number of Rx Opioid Medical Examiner Occurrences by Florida Management Regions: 2016

<table>
<thead>
<tr>
<th>Region</th>
<th>Oxycodone</th>
<th>Hydrocodone</th>
<th>Methadone</th>
<th>Morphine</th>
<th>Fentanyl</th>
<th>TOTAL</th>
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<td>154</td>
<td>491</td>
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<td>606</td>
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<tr>
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<td>692</td>
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<td>2,040</td>
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<td>6,257</td>
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</table>

*Source: Florida Medical Examiners Commission 2016 Annual Report*

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### Fentanyl Analogs

- **Best known = Carfentanil**
  - 100 times as potent as Fentanyl, **5,000 times as potent as heroin** *
  - Legal to be sold in China until March 2017 so widely available
  - No human use but sold as a tranquilizer for large zoo animals (elephants, rhinos, etc.)
- Others include acetylfentanyl, butyrfentanyl, furanylfentanyl, and ocfentanil and newly designed fentanyl analogs such as acrylfentanyl and paraffluoroisobutyrfentanyl. No legal use
- There are numerous possibilities to create new analogs by small changes in chemical structures. – clandestine labs

*National Institutes of Health*
Fentanyl Analogs

- Florida Medical Examiners first reported these as a separate category in 2016 data. Manatee County is an outlier
  - Present in 1,026 deaths statewide (3 more than heroin!)
  - Causal in 965 deaths (94%)

- How should we report these deaths? (Unlike Fentanyl, they are NOT prescription opioids) – legal status *similar to heroin*?

Figure 20: Number of Nonmedical Rx Opioids (Including Fentanyl Analogs) Occurrences Detected among Decedents Florida 2005 – 2016

Source: FDLE – Drugs Identified in Deceased Persons by Florida Medical Examiners Jan 2005 - June 2016 Reports
Heroin

- Rapid increase in heroin-related deaths in past five years
- Over 1,000 heroin-related deaths in 2016 versus 56 in 2011.
- Most DCF regions of the state have experienced this rapid increase (slower in Northwest)

Figure 21: Number of Heroin-Related Deaths Florida 2000-2016

Source: Florida Medical Examiners Commission 2016 Annual Report
Regional Differences?

- Most regions have been affected by increased heroin deaths

- Rate of increase seems slower in Northwest region but this may simply reflect smaller population.
  - (For example, both Northwest and Southern regions have seen a fourfold increase since 2014.)

Figure 22: Number of Heroin-Related Deaths by Florida Management Regions: 2000 - 2016

Source: FDLE – Drugs Identified In Deceased Persons by Florida Medical Examiners 2016 Annual Report
Table 2: Number of Heroin-Related Deaths by Florida Management Regions: 2001-2016

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Source: FDLE – Drugs Identified In Deceased Persons by Florida Medical Examiners 2016 Annual Report

Table 3: Increase in Deaths with Occurrences of Various Opiates 2015-2016

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<td>Fentanyl &amp; Analogues</td>
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<td>514</td>
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Source: FDLE - Florida Medical Examiners Commission
Exhibits and Tables for 2017 Florida Trends Report

Figure 23: Total Opioid Occurrences and Number and Percent as Cause of Death Among Deceased Persons in Florida: Jan 2016 - Dec 2016

Source: FDLE - Florida Medical Examiners Commission

Increased Opioid Deaths - Summary

- Opioid deaths increased dramatically in Florida in 2016
- Fentanyl, fentanyl analogs and heroin were driving forces
- Medical Examiners Report notes: “Since heroin is rapidly metabolized to morphine, this may lead to a substantial over-reporting of morphine-related deaths as well as significant under-reporting of heroin-related deaths. “
- High potency and mixing of fentanyl and analogs with street drugs seem likely to be tied to many deaths
- Greater prevalence of use? Or is it greater lethality of opioids in the environment?
IX. Cocaine

- Anecdotal reports of increased trafficking in Florida in 2017

- Dramatic increase in occurrences in deceased persons in 2016
  - Up over 1,000 cases versus 2015
  - Increase affects most regions of the state

Source: Florida Medical Examiners Commission 2016 Annual Report
Figure 25: Cocaine Deaths in Florida by Managing Entity Regions 2000 - 2016

Source: Florida Medical Examiners Commission 2016 Annual Report

Table 4: Number of Cocaine-Related Deaths by Florida Management Regions: 2001-2016

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<td>382</td>
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<td>560</td>
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<tr>
<td>Broward</td>
<td>84</td>
<td>121</td>
<td>138</td>
<td>120</td>
<td>136</td>
<td>150</td>
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<td>146</td>
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<td>127</td>
<td>115</td>
<td>129</td>
<td>102</td>
<td>99</td>
<td>152</td>
<td>328</td>
</tr>
<tr>
<td>Southern</td>
<td>163</td>
<td>167</td>
<td>200</td>
<td>170</td>
<td>180</td>
<td>198</td>
<td>308</td>
<td>213</td>
<td>169</td>
<td>209</td>
<td>191</td>
<td>211</td>
<td>230</td>
<td>240</td>
<td>302</td>
<td>459</td>
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<tr>
<td>Total</td>
<td>1,105</td>
<td>1,307</td>
<td>1,614</td>
<td>1,702</td>
<td>1,943</td>
<td>2,052</td>
<td>2,179</td>
<td>1,791</td>
<td>1,462</td>
<td>1,402</td>
<td>1,444</td>
<td>1,318</td>
<td>1,337</td>
<td>1,508</td>
<td>1,834</td>
<td>2,882</td>
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</table>

Source: Florida Medical Examiners Commission 2016 Annual Report
X. Methamphetamine and Amphetamines

- Imports of methamphetamines from Mexico have become a major source, but domestic production in small labs persists.
- 540% increase in six years in occurrences in ME reports.
- 621 related deaths in 2016 of which methamphetamine was considered a cause in 327 (53%).
- Amphetamines also caused 199 deaths and occurred 640 times in toxicology reports of decedents.
- Regional data not available from ME reports.

Figure 26: Number of Methamphetamine-Related Deaths in Florida: 2000-2016

Source: Florida Medical Examiners Commission Jan 2004-Jun 2016 Reports
XI. Benzodiazepines

- Used along with other drugs and alcohol

- Benzodiazepine-related deaths peaked at 6,188 in 2010 and then declined as the State’s efforts to reduce diversion of controlled medications took effect. These deaths appear to have been on the increase over the past two years

- There were 5,167 reports of a benzodiazepine present in deceased persons across Florida in 2016, a 12% increase from 2015.

Figure 27: Number of Nonmedical Rx Benzodiazepine Reports Detected among Deceased Persons in Florida 2005 – 2016

Source: FDLE – Drugs Identified In Deceased Persons by Florida Medical Examiners 2005 - 2016 Annual Reports
Benzodiazepines

- Alprazolam (Xanax®) and Diazepam (Valium, Diastat) are the benzodiazepines most often listed as a cause of death by Medical Examiners
- Alprazolam occurrences are up in all regions of the State
- Diazepam occurrences are down in the northern regions, stable in Suncoast, but up in other regions

Table 5: Number of 2016 Occurrences and Percent Change 2015-2016 in Deceased Persons of the 2 Benzodiazepines, Alprazolam (n= 1,851) and Diazepam (n= 664) by Florida Managing Entity Regions

<table>
<thead>
<tr>
<th>Region</th>
<th>Alprazolam</th>
<th>% Change Alprazolam</th>
<th>Diazepam</th>
<th>% Change Diazepam</th>
<th>2016 Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northwest</td>
<td>118</td>
<td>+10.3</td>
<td>42</td>
<td>-6.7</td>
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<tr>
<td>Northeast</td>
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<td>102</td>
<td>-9.8</td>
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<tr>
<td>Central</td>
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<td>+14.5</td>
<td>151</td>
<td>+23.7</td>
<td>506</td>
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<tr>
<td>Suncoast</td>
<td>486</td>
<td>+14.6</td>
<td>166</td>
<td>+1.2</td>
<td>652</td>
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<tr>
<td>Southeast</td>
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<td>+79.5</td>
<td>106</td>
<td>+41.3</td>
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<td>Broward</td>
<td>169</td>
<td>+81.7</td>
<td>37</td>
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<td>Southern</td>
<td>251</td>
<td>+16.2</td>
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<td>All Florida</td>
<td>1851</td>
<td>+28.6</td>
<td>664</td>
<td>+9.9</td>
<td>2,043</td>
</tr>
</tbody>
</table>

Source: FDLE – Drugs Identified in Deceased Persons by Florida Medical Examiners 2016 Annual Report
XII. Emerging Drug Issues

• Example: Kratom – Mitragyna
  – Kratom (tree) native to Southeast Asia
  – Contains the drug mitragyna which produces both stimulant effects (in low doses) and sedative effects (in high doses)
  – Kratom is mainly consumed orally as a tea, but it may also be smoked or its leaves may be chewed.
  – Advocates argue that it is a natural treatment for chronic pain
  – Concerns exist that use may lead to addiction

  – Drug Enforcement Administration

Kratom

• Drug Enforcement Administration (DEA) originally proposed to list Kratom as Schedule 1 but public outcry led to delay – now listed as a “drug of concern”

• Banned in five states and in Sarasota County (2014)

• Currently sold in convenience stores elsewhere in Florida and in “herbal bars” in south Florida

• Bill filed in 2017 to make it illegal in Florida, not supported by Florida Department of Law Enforcement (FDLE)
XIII. Efforts to Combat New and Existing Drugs of Abuse

- March 2017 - China's National Narcotics Control Commission (CNNCC) added carfentanil to its controlled substance list

- November 2017 – U.S. DEA announced the scheduling of all fentanyl-related substances on an emergency basis

- Florida passed harsher penalties for fentanyl (2017)

- Florida defined novel psychoactive substances and analogs chemically to extend bans to them (2017)

Questions/Comments
XIV. References

- Center for Disease Control. Behavioral Risk Factor Surveillance System. [Prevalence and Trends Data Online](#)

- Florida Department of Law Enforcement: Florida Medical Examiners Commission Annual Reports on Drugs Detected in Deceased Persons in Florida 2010 – 2016.


- Center for Disease Control and Prevention: [2003 to 2015 Youth Risk Behavior Surveillance System (YRBSS) Bi-annual Surveys](#)


- Substate Estimates from the 2012-2014 National Survey on Drug Use and Health (NSDUH).