

Understanding Youth Multiple Substance Use through Visualization - Chew tobacco's nasty friends

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Introduction

- Content: Multiple substance use among adolescents
 - Adolescence = "vulnerable period"
 - Biologically, socially & psychologically
 - Tobacco use almost never occurs isolated (huge body of evidence, neurobiology of drug effects)
- Method
 - Making complex relationships intelligible
 - Visualization w/ overlapping surfaces

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Introduction

- Consequences
 - Alter our conception of adolescent drug use
 - Chew use indicates something else than alcohol use
 - Alter our prevention efforts
 - Cannot target tobacco individually
 - Alter our intervention efforts
 - Inter-departmental collaboration for treatment of tobacco users

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The problem

- How many alcohol users also smoke?
- How many smokers also drink?
- Formal set theory:
 - $p(A|B) = p(B|A)$, if $p(A \cap B) = p(A) \cdot p(B)$, therefore
 - $p(A|B) \neq p(B|A)$, if $p(A \cap B) \neq p(A) \cdot p(B)$
- What happens with more than 2 categories?
Can anybody still figure these relationships?

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Numbers & Findings

- ...come from AYS, 60,000+ individuals from grades 8, 10, 12 across AZ public schools
- 8th grade prevalence rates ('used at least once during the past 30 days')
 - Alcohol: 24%
 - Cigarettes: 11%
 - Marijuana: 9%
 - Chew tobacco: 3%
 - What about cigs AND alcohol? Cigs AND alcohol AND chew? Alcohol IF cigs & chew?

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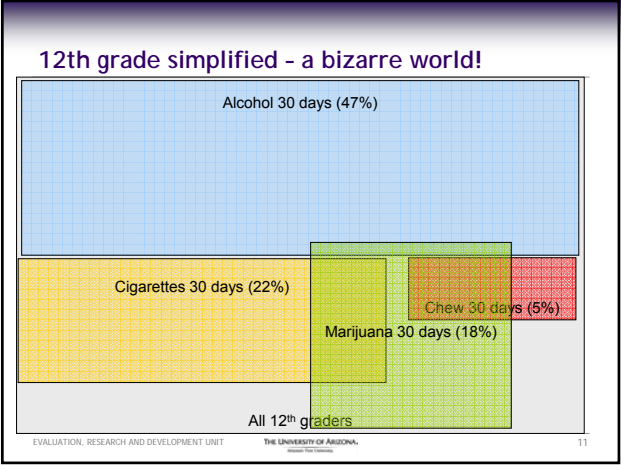
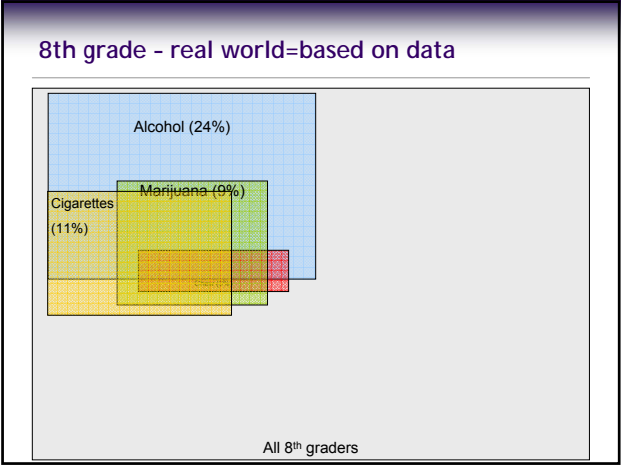
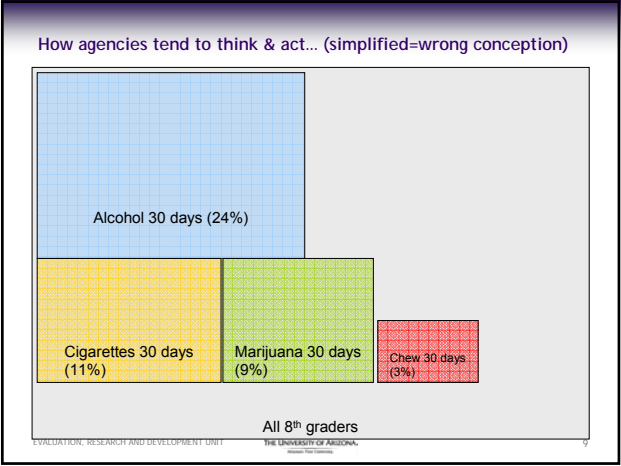
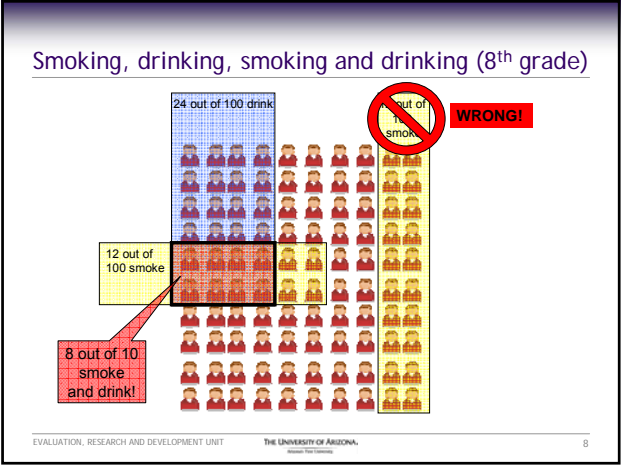
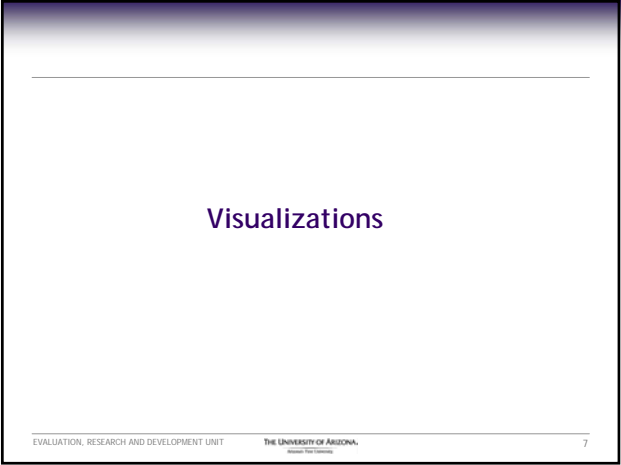
A "simple" crosstab of 8th graders

Alcohol Past 30 days * Cigarettes past 30 days Crosstabulation^a

Alcohol Past 30 days	no	Count	Cigarettes past 30 days		Total	
			no	yes		
no	17250	17250	no	yes	17931	
			% within Alcohol Past 30 days	96.2%	3.8%	100.0%
			% within Cigarettes past 30 days	81.7%	27.7%	76.1%
			% of Total	73.2%	2.9%	76.1%
yes	3866	3866	no	yes	5642	
			% within Alcohol Past 30 days	68.5%	31.5%	100.0%
			% within Cigarettes past 30 days	18.3%	72.3%	23.9%
			% of Total	16.4%	7.5%	23.9%
Total	21116	21116	% within Alcohol Past 30 days	89.6%	10.4%	100.0%
			% within Cigarettes past 30 days	100.0%	100.0%	100.0%
			% of Total	89.6%	10.4%	100.0%

^a Grade = 8th

Annotations: $p(\text{cigs}|\text{alc})$, $p(\text{alc}|\text{cigs})$, $p(\text{alcohol})$, $p(\text{cigarettes})$



Conclusion

Content

- Multiple substance use notion paints more appropriate picture of reality
- Sub-populations might differ on multiple use pattern
- Multiple use pattern changes with age
- Multiple patterns have different 'natural histories'
- Patterns necessitate differential treatments
 - One-size-fits-all prevention approach the right way?

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Conclusion

Method

- Visualizations can be utilized whenever simultaneously occurring events need to be understood
- Great tool for rendering complex “Bayesian” relationships
- Lack of easy-to-use software!
 - <http://www.cs.uvic.ca/~schow/DrawVenn/instructions.html>

La Fin

Thank you!

Unused slides

All kids in AYS 2006 (N=60,000)

