



## Analyzing Indicators

There are many ways to analyze indicators. The way(s) you analyze a given set of indicators will be based on your needs and how you intend to use the information. Sometimes you only need to look at one indicator, but most often examining a data set is the better option because it gives you the opportunity to analyze an individual indicator and/or indicators in combination with one another. Analyzing combinations of indicators will likely produce more useful information than looking at a single indicator.

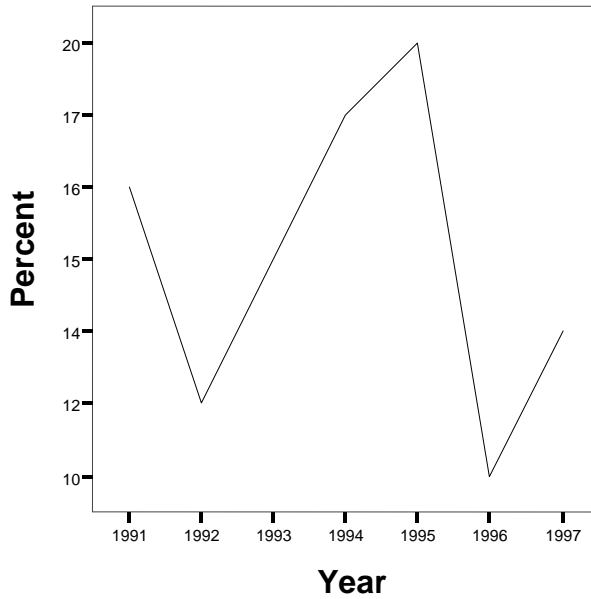
### *Analyzing Individual Indicators*

- To read graphs carefully, please consider the following:
  - all of the titles
  - x-axis and y-axis
  - labels
  - unit of measurement.

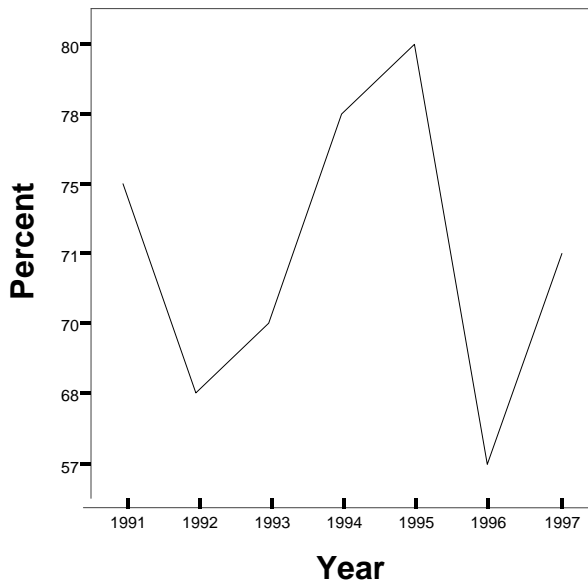
Note Example on following page: Although the two graphs below look similar, the highest percentage of one is 20 and the other is 80.

Example:

**Percent of 9<sup>th</sup> grade students using alcohol, (30 day use 1991-1997)**



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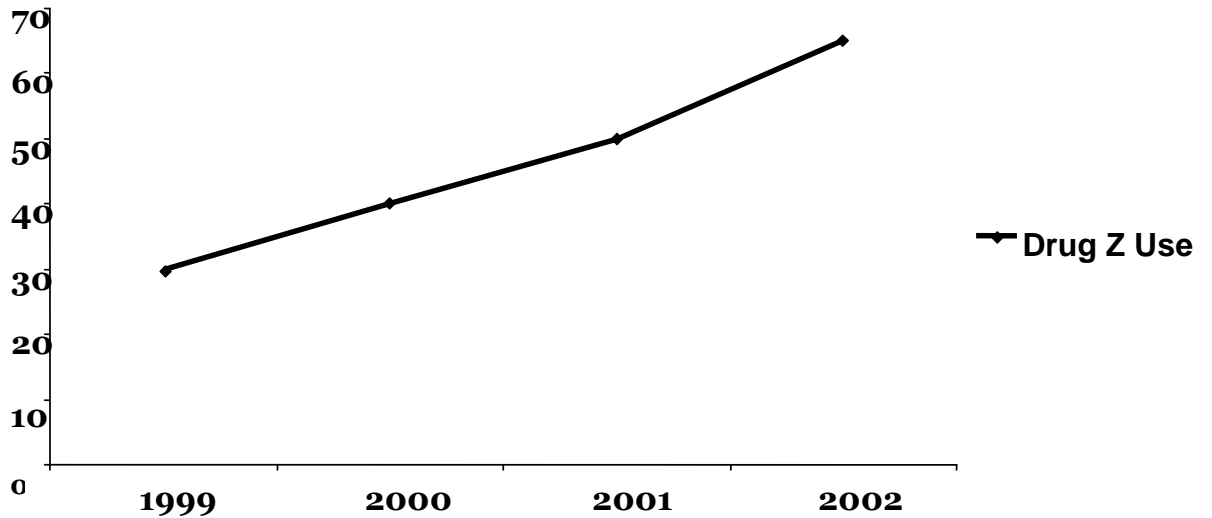


- Make sure your data match what is shown on your graph.

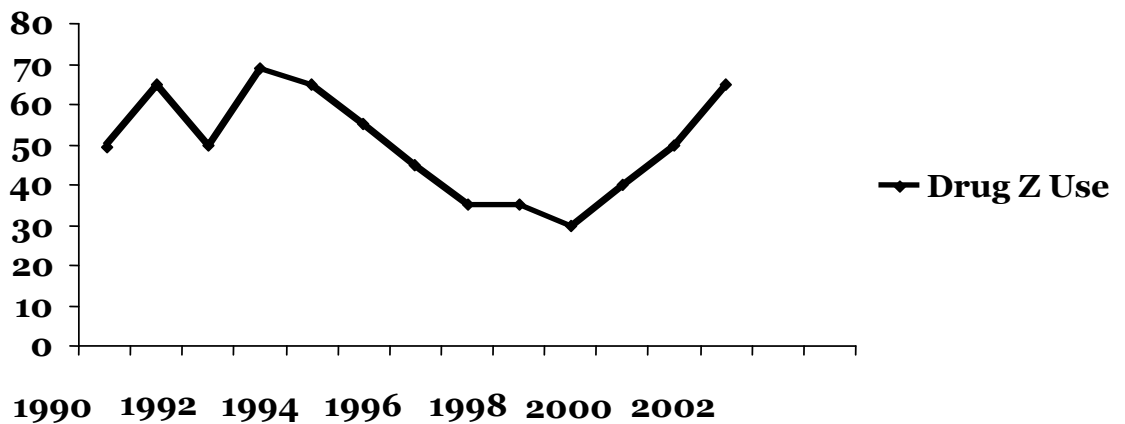
- Read accompanying definitions, explanations and footnotes.
- Examine trends. To do this, ask yourself what, if any, pattern(s) emerge? Are they decreasing, increasing, staying about the same, or changing frequently? To what extent? Sharply or moderately? Also pay attention to the period of time over which the trend lasts.

Example:

**Example: Drug Z Use (percentage of adults, 30 day use) 1999-2002**



**Example: Drug Z Use (percentage of adults, 30 day use) 1990-2002**



- Calculate ratios. You can compare a particular county to, for example, another county, or the state or nation. To do this, take the county's percent and divide it by the percent of whatever location you are comparing it to. Once calculated, ask if the ratio is above, below, or similar to the compared location

Example:

To compare 12<sup>th</sup> grade students in Hennepin County who reported smoking a cigarette within the past 30 days with 12<sup>th</sup> grade students across the state of Minnesota, you would divide 23.9% by 29.5%<sup>1</sup>. This equals 0.81.

$$\frac{\text{County Percentage}}{\text{State Percentage}} = \text{Ratio} \quad \frac{23.9 \%}{29.5 \%} = 0.81$$

Then you ask: how do Hennepin County 12<sup>th</sup> graders compare to the rest of Minnesota 12<sup>th</sup> graders? This is to say if there are 100 12<sup>th</sup> grade students in Minnesota smoking within the past 30 days, in comparison there are 81 who have smoked in Hennepin County within the past 30 days.

Note: A ratio of above 1.0 means that based on the data, the county is higher than the state average and vice versa.

The last point to consider: even though Hennepin County is below the state average, does this mean that there is no problem? Should we just ignore those "81" student smokers? There is never a perfect answer. But knowing whether your county or community is higher or lower than the comparison location could be a very important tool in understanding where to apply more attention.

#### *To Analyze Multiple Indicators*

- Select indicators that you believe are going to contribute to your assessment with efficiency and accuracy. When analyzing the indicators, do they all point in the direction of a problem or do they point in opposite directions?
- Create a ratio calculation table. (See page 6)
- Examine your assumptions - just because you may believe that certain indicators work together check to see if they are correlated. For example, when trying to explain a rise in tobacco use among teens, you may look at age of onset and living arrangements. While age of onset is a good indicator, data may limit the prediction that living arrangements is a contributing indicator. Or vice versa.

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<sup>1</sup> Substance Use in Minnesota: A State Epidemiological Profile, pg 160-161

## *Tips for Analyzing Data*

- Be sure to analyze the data. Read the definitions, explanations, and footnotes because some of the data have limitations that may lead to inaccurate interpretations.
- Generally, the fewer the limitations of an indicator, the more you may be confident in their meaningfulness. A way to determine this is to fully understand the source from which the data came. Seek out experts on the information, ask them questions or read their reports<sup>2</sup>.
- Understanding the difference between percentages and numbers of respondents/cases can lead to less error when interpreting the findings. Percentages are useful in very large sample sizes and/or weighted samples. But number of respondents/cases may be preferred to percentages when, for example, examining a change over a year because it may be only a small increase or decrease. A very small increase could lead to a very large percentage change<sup>2</sup>.
- After all this analysis you may need to use different sets of data or sources to get a better picture of the issue. Additional datasets may provide better ways to get closer to more meaningful results. You may also need to seek another person or groups perspective that is not involved with the analysis but has background on the issue, to make sure that your proposed resolution is focusing on the right outcome. For example, you provide recommendations, based on your analysis stating that there is are 4.5% of 12<sup>th</sup> grade students who use methamphetamines in the local high school, to a high school student focus group. Not that this isn't a problem but, the focus group thinks it is a bigger issue that 64.2% of 12<sup>th</sup> grade students have used alcohol within the past 30 days and of those students 32.5% of them reported binge drinking within the past 2 weeks. After looking at these numbers it is pretty easy to see that there is a much larger alcohol problem that may need to be addressed first.

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<sup>2</sup>How to Analyze Data, [http://www.health.state.mn.us/divs/hpcd/chp/hpkit/text/ch\\_main.htm](http://www.health.state.mn.us/divs/hpcd/chp/hpkit/text/ch_main.htm)

## Putting Indicators to Use

Once you have chosen which indicators are going to be most useful in contributing to successfully dealing with your issue, the next step is to fully understand the ratios and how they can help you prioritize your agenda to achieve your goals. If you have data showing performance of these indicators over the past few months, years, or decades you will be able to perform trend analysis. Such an analysis is very helpful when trying to find out which indicator needs most attention.

The Alcohol, Tobacco, and Other Drug (ATOD) Indicators Prioritization Matrix (pictured below) gives a breakdown of the data. It also targets exactly where to focus efforts based on gender, age, race, etc. For this example we chose 3 substances (heroin, crack/cocaine, and others prescription drug use in the past 12 months) and separated them by gender. Next we calculated the ratio by comparing the county's percent to the MN percent for each substance and gender<sup>3</sup>.

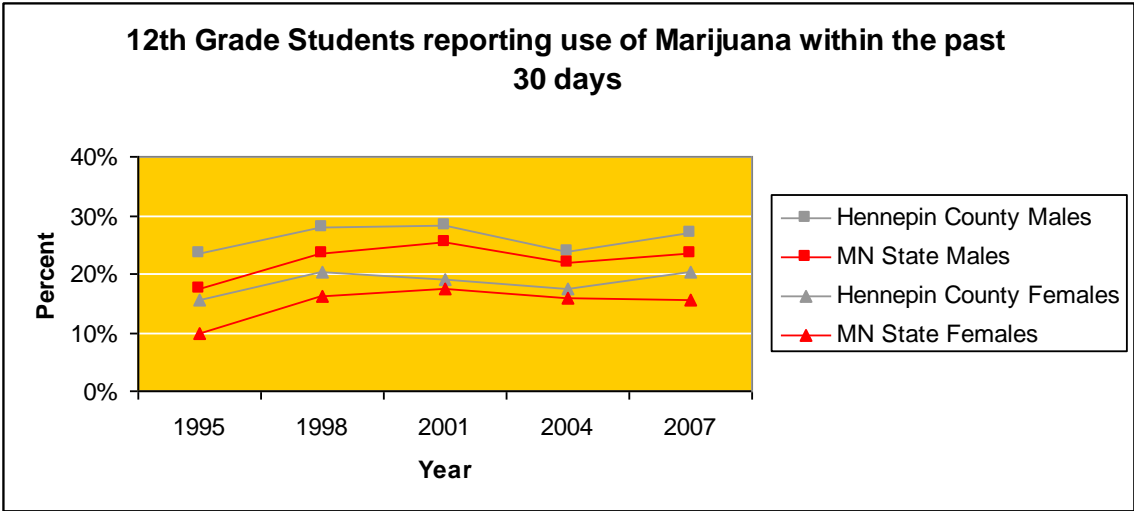
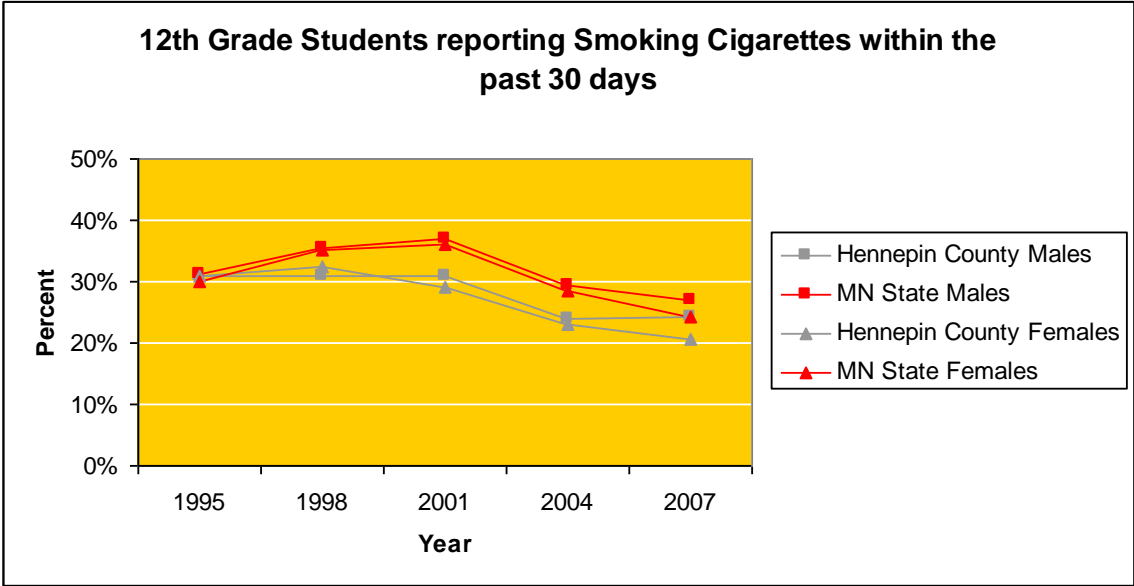
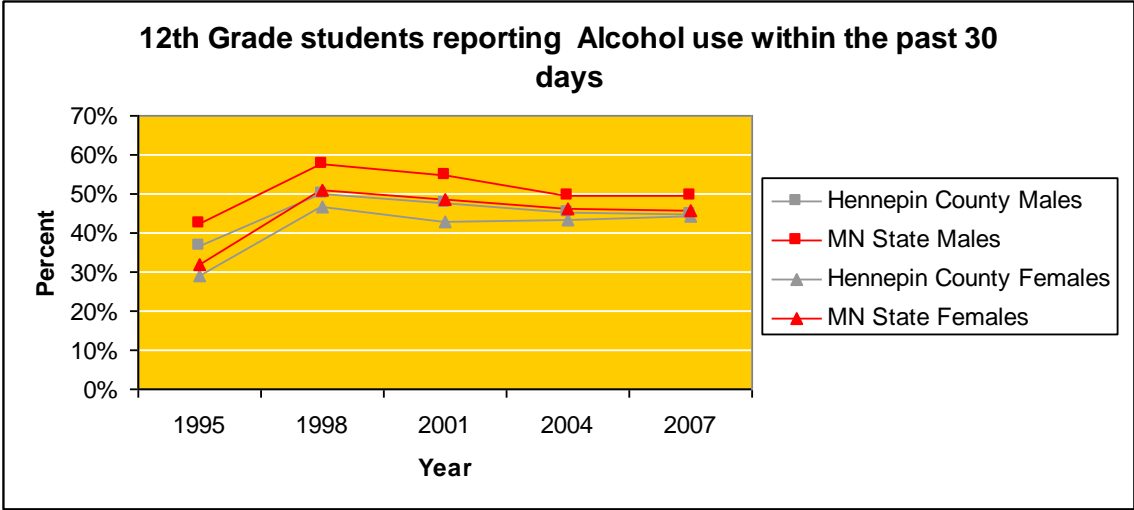
### Ratio Calculation Table

	Males	Females
2007		
Past 30 day use		
Alcohol	$44.8 \div 49.3 = 0.91$	$44.3 \div 45.9 = 0.97$
Cigarettes	$24.2 \div 27.1 = 0.89$	$20.7 \div 24.1 = 0.86$
Marijuana	$27.0 \div 23.5 = 1.08$	$20.4 \div 15.6 = 1.11$

After collecting the ratios, compare them to the trend graphs (see next page). For example, is Hennepin County's 12<sup>th</sup> grade male use of marijuana in 2007 higher, lower, or the same as the state and is it increasing, decreasing, or staying about the same as it was in 2004, between the county and the state? Continue to compare each indicator, placing an X in the appropriate box for your interpretations (see the completed sample matrix on page 8)<sup>4</sup>.

<sup>3</sup> [www.sumn.org](http://www.sumn.org), 2008

<sup>4</sup> Note: there is no numeric way of separating similar, above, and below to MN. Placing the X's anywhere in the box can give a more detailed interpretation of the data. For example; placing the X closer to being stable, rather than in the middle of the rising box could be easier to understand.



## ATOD Indicators Prioritization Matrix

		Rate Comparison		
		Above MN Rate	Similar to MN Rate	Below MN Rate
Recent Time Trend 2004-2007	Rising			
	Stable	X-Male marijuana use X-Female marijuana use		
			X-Female alcohol use	X-Male Alcohol use X-Male Cigarette use
	Falling			X-Female Cigarette use

- When filling in the matrix, ask yourself how you would rate the comparisons. For example, although Hennepin County is above the MN rate for male marijuana use, was the trend rising or falling? Also you may want to consider the total numbers of persons using each substance. For example, male alcohol use may have a ratio comparable to the state but the number of users is very high. On the other hand, the ratio of female heroin users to state heroin users could be very high, but the number of users is very low.
- After the ATOD Matrix is filled in completely, what problems, according to this data, seem to be of most concern? How have you prioritized your county's issues? Do your priorities and what the data tell you align?
- Now you need to make decisions based on your comparisons. Is your county ready to make changes? Do you need to address different issues first? Which problems seem to be most urgent? What attitudes and norms do the residents have about substance abuse? For example: What if your county or city has traditionally served alcohol at every occasion and survives economically because of the brewery in that community or region? How is that issue addressed?