

# TIP SHEET

## How to Analyze Data

### Understanding and Presenting Your Data

The term "data" refers to a set of information which can be organized for making decisions. The use of data is central to each of the core public health functions. Sometimes the data are in the form of numbers (e.g. the number of youth drinking alcohol). Sometimes the data are in the form of stories and opinions (e.g. community attitudes about youth consumption of alcohol).

This section will discuss the following:

- **How to Trust the Data**
- **Questions to Ask About the Data**
- **What to Consider When Reviewing the Data**
- **How to Frame the Data for Your Audience**

### How Can I Trust the Data I Have?

- **Work with a team to interpret data.**  
Talk to community members about the patterns in the quantitative data. They may be able to explain the trends in the data. For example, a sudden increase in DWI arrests in your community does not necessarily mean that there was an actual increase in DWI activity. The increase in arrests may be the result of increased patrolling for impaired drivers.
- **Compare the information from different sources.**  
You'll get a better picture of the chemical health issues affecting your community if you compare findings from different sources (community forums, student surveys, community health profiles).
- **Determine if different data sources are measuring different aspects of the issue.**  
For example: in a survey of Minnesota women, more women thought that crack or cocaine use during pregnancy harmed the largest number of newborns in the United States, when the actual numbers show that alcohol use during pregnancy affects more newborns than cocaine. The perception is different from the facts. Knowing that can help when educating the public.

## **Ask the Following Questions:**

### **1) Is the sample representative of the general population?**

Usually, data are not collected from 100% of the people you are interested in studying. This is too expensive. Instead, data are collected from a smaller group, or a "sample" of people. To have confidence in sample data, the sample needs to "look like" or be representative of the general population.

**For an example, see Mock Duck County Example**

### **2) Who was included in the study and who was excluded?**

If only people enrolled in community education classes were surveyed, then you can only draw conclusions about people who were enrolled in the classes. There may be something special about the people attending the class (perhaps they live mostly in one part of town, or have more interest in the subject matter). Therefore, their opinions may not mirror the opinions of the rest of the population.

### **3) Is the data item under-reported?**

The Department of Public Safety notes that in alcohol-related crashes, only the officer's perception of alcohol use is reported. Thus, the number of alcohol-related crashes are probably underestimated.

### **4) Who are the experts on this information?**

If you are getting data from other sources, read their reports or ask them questions about the data. They will be able to tell you the strengths and limitations of the data.

## What to Consider When Reviewing the Data

### - Small Numbers/Infrequent Events

Example: One year a county has one liver cirrhosis death; the next year the county has two liver cirrhosis deaths. This means there has been a 100 percent increase in liver cirrhosis death. It seems dramatic, but the actual increase was by one case. When you are interested in events that happen infrequently, any change in the number of events leads to abrupt fluctuations in trends.

### - Strategy: Combine two or more years of the data.

This strategy works as long as there has not been a major change in the way the event is measured (e.g., changes in the law, data collection methods, the definition of the problem, or the cultural context)

### - When combining years, work with the number of events not the percentages. Add the events across years, and then calculate the percentages.

**Example: Combining two or more years of data**

#### **Mock Duck County Motor Vehicle Fatalities**

	<b>Total Fatalities</b>	<b>Alcohol- Related Fatalities</b>	<b>Percent Alcohol- Related</b>
<b>1998</b>	<b>1</b>	<b>0</b>	<b>0%</b>
<b>1999</b>	<b>3</b>	<b>1</b>	<b>33%</b>
<b>2000</b>	<b>4</b>	<b>3</b>	<b>75%</b>
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<b>Combined</b>	<b>8</b>	<b>4</b>	<b>Combined avg.=50%</b>

### - Comparisons

Comparisons can help you target your audience. Common comparisons include: age, gender, race/ethnicity, and geography.

## - Trends

Trends over time can help you see patterns in the behavior or event you are observing. When considering trends in data, note the following:

- What time period are you looking at? (e.g. years, seasons, days)
- Is there an increase or decrease in the number of events over time?
- What is the overall extent of change over time?

Trends can be influenced by:

- 1) Small numbers of events
- 2) Changes in data collection methods.  
A change in the way the data are collected can alter the answers gathered.
- 3) Changes in how problems are defined.  
Trends in driving while impaired (DWI) are affected by the change in the definition of the legal drinking age. In 1973, the legal drinking age was 18; in 1976, it was raised to 19; and in 1986, the drinking age was raised to 21.
- 4) Changes in cultural context  
Trends may be influenced by changes in: social/political norms, laws, organizational policies, and/or attitudes and beliefs of teachers, physicians and police officers. For example: the rate of reported cases of fetal alcohol syndrome (FAS) among newborns in the United States during 1979-1992 increased approximately fourfold. The increase may reflect a true increase in the number of infants with FAS, or an increase in the awareness and diagnosis of FAS in newborns.

## **Framing the Data for Your Audience**

- **Determine the audience you want to reach.**  
(Funding source, county commissioners, parents, professionals, merchants, etc.)
- **Determine the issue they are most interested in.**  
Focus on the issue(s) and make your points concise. Most audiences are interested in a few solid numbers and a couple of anecdotes to illuminate the your findings and recommendations.
- **Decide what information you want to emphasize.**  
Decide which findings most strongly justify or support the prevention strategies and policies you advocate. Frame these findings in a way that "speaks out" to the audience.

**Remember:** The same information can be framed in different ways. In Minnesota, the percent of 12th graders who used alcohol at least once a month in the previous year decreased from 54% in 1989 to 41% in 1992. If you want to focus on the message that prevention work has been effective, highlight this as a positive trend. If you want to focus on the work that still needs to be done, emphasize that alcohol is illegal for 12th graders until age 21.