



Understanding Data & Research

Each day, we are exposed to the information in various forms. We see the results of research studies, are provided with facts and data, and have an unlimited source of information on the Internet. The barrage of information we see can be helpful but should be approached with care. Additionally, individuals who perform research should exercise caution when collecting data. In this issue of Facts on KIDS we will discuss some guidelines for collecting and selecting data sources, analyzing data, and understanding what research tells us.

Have you ever:

- Calculated how long it would take to drive from point A to point B?
- Figured your tax return?
- Prepared your household budget for the month?
- Balanced your checkbook?

Information is key to planning effective change. Changing policies to improve conditions requires facts. Successful change must have at its foundation reliable data that make a case or prove a point. Unfortunately, the very term “data” intimidates many. To use data effectively one needs to know where to find, how to select and make sense of numbers and facts to perform the mathematical basics learned in elementary school — counting, adding, subtracting, multiplying, and dividing.

Collecting/Selecting Data

Collecting data can be an overwhelming process. With access to the internet, there are limitless sources of information. When collecting data, it is important to keep these things in mind¹:

- What is the purpose of my search?
- What issues will be covered? If the topic to be covered is general, then a broader range of data will be required; if it is to be more specific, a more in-depth data collection will be required.

- What data are available? Once the issues have been defined, it is necessary to determine what data are available. Not all data that would be useful is available, particularly at local levels. If comparisons between states are being made, it is important to collect data from at least the states being compared and, preferably, all 50 states. It is also a good idea to collect more than one year.

- Are data comparable? It is essential that the same data are measured and reported for every area researched from one year to the next. Be sure to check the definitions of the data used. There are instances where the data have the same name but have different definitions.

- What are the generally accepted standards of “good” and “bad”? If data will be ranked, it is



important to establish what the desired results are. For example, it is generally accepted that a high infant mortality rate is “bad” and a low rate is “good”.

- What measures are generally accepted? Research is considered more credible if measures that are accepted by experts within the field are used.
- What are the benchmarks for progress? Determine whether there are benchmarks against which progress may be measured, especially if standards have been set by a group of experts.

Here are things to consider when selecting data²:

- Use data from official sources;
- Check your numbers, then recheck them;
- Do not hire an outside expert out of frustration to analyze data, but do work with people who understand data;
- Use the most current data available;
- Use data that show some intervention will make a difference.

Analyzing Data

While many sophisticated statistical procedures are used in research and data presentation, there are some commonly used calculations that are useful in understanding data³.

Average

This identifies the middle of the group, or what is typical for the group and is calculated the same as the mean.

Mean

Mean is, most commonly, another word for average. A mean is calculated by adding all the individual data points in a group and dividing by the total number in the group.



Median

The median relates to the value that is in the middle of the set of data. When values are arranged from largest to smallest, the one in the middle is the median value.

Percentages

“Percent” means per one hundred. For example, 25% means 25 out of 100. To calculate a percentage you need two pieces of information: the number in the entire (or total) group, and the number in the part of the group that interests you (the subgroup). The formula is:

$$(\# \text{ in the subgroup} / \# \text{ in the total group}) \times 100$$

Subgroup: South Dakota 2005 population estimate under age 5 = 52,218

Total Group: South Dakota 2005 population estimate = 775,933

$$(52,218/775,933) \times 100 = 6.7\% \text{ children under age 5}$$

Rates

A rate is a measure of how common an event is in a particular place at a particular time. To calculate a rate, three pieces of information are needed: the number in the total group, the number in the subgroup of interest, and the multiplier, or the “per” number, that is per 100, 1,000, or 100,000.

The formula for calculating a rate is:

$$(\# \text{ in subgroup} / \# \text{ in total group}) \times \text{multiplier}$$

Subgroup: Infant Deaths (2002) = 70

Total Group: Births (2002) = 10,698

$$(70/10,698) \times 1,000 = 6.5 \text{ deaths per 1,000 births}$$

When calculating rates, the numbers used should be large enough to be meaningful. Rates based on small numbers can vary tremendously from year to year and are not considered reliable.

Ratios

A ratio measures the relationship between two numbers. It is simply one number divided by another and tells how much larger or smaller one number is when compared with the other. For example, in 2000, there were 26,205 female-headed families in South Dakota and there were 10,734 male-headed families. The ratio of female-headed families to male-headed families can be calculated:

$$(1^{\text{st}} \text{ group} / 2^{\text{nd}} \text{ group})$$

$$26,205 \text{ (female-headed families)} / 10,734 \text{ (male-headed families)} \text{ or } 2.44 \text{ female-headed families to } 1 \text{ male-headed family.}$$

Any two numbers can be compared this way if the same measure for two groups for the same year is used or if one group in two different years is used.

Change Over Time

When comparing data from different point in time, it may be necessary to calculate the amount of change from one time period to the next. The “rate of change” may be calculated:

$$(\text{newer year \#} - \text{older year \#}) / \text{older year \#} \times 100$$

newer year number: 2005 est. SD population under 20 = 212,854

older year number: 2000 SD population under 20 = 227,481

$$(212,854 - 227,481) / 227,481 \times 100 = -6.43\% \text{ difference}$$

The resulting number is negative (meaning there was a decrease over time). In other cases, the resulting number is positive (meaning there was an increase over time).

Accounting for Inflation

Accounting for inflation can be important when comparing monetary values and purchasing power in differing years. Inflation can be defined as the overall general upward price movement of goods and services in an economy. In order to get an inflation factor, it is necessary to use the Consumer Price Index (CPI) for each of the years in question. The Consumer Price Index (CPI) is a measure of the average change in prices over time of goods and services purchased by households. This can be found at the Bureau of Labor Statistics website (<http://stats.bls.gov>).

For example, with the CPI's for 2000 (172.2) and 2001 (177.1) the inflation factor can be calculated:

$$1.028(\text{Inflation factor}) = 177.1(2001 \text{ CPI}) / 172.2(2000 \text{ CPI})$$

The inflation factor can be used to convert older dollar amounts into current year dollars by multiplying the older year by the factor:

$$1.208 \times \$10,000 = \$12,080$$

Understanding Research

Research enables us to evaluate the effectiveness of programs and policies. Because of this, it is important to carefully evaluate the research to fully understand its implications. In *Understanding Research: Top Ten Tips for Advocates and Policymakers*, Stephanie Schaefer, PhD provides these suggestions when evaluating research⁴:

- Consider the source: Research conducted by respected researchers is more likely to be trustworthy. Also, research produced or funded by groups with a strong political or commercial agenda should be regarded with caution as these groups may have a vested interest in the study's findings.
- Media is also a source to be evaluated: Media coverage may oversimplify the results of research, leading to misinterpretation. It is important to follow-up and get information from the original source.
- Has the research been published, and where? Research published in peer-reviewed research journals is more reliable because it has been scrutinized by other researchers before being published.
- Research results are really about the topic, as measured, not as we may think of it: In any research, the topic studied is measured in some specific way. Knowing how the topic is measured helps to understand what the research is about. Also, different studies may define the same topic differently.
- Different types of research have different strengths: There are two broad categories of research: quantitative and qualitative. Quantitative research uses numbers and analyzes and reports in numeric form. Qualitative research typically reports results through descriptions

instead of numbers. It is particularly well suited to finding new things to examine and survey.

- Sampling is more important than sample size: Because quantitative research is based on the assumption that the findings for a sample of people can be generalized to the larger population, the method of collecting the sample is extremely important. If the sampling is not done carefully, the findings for the group cannot be generalized to the population.
- Statistical significance: A statistically significant result is one that is unlikely to be due to chance. Researchers use statistics to test whether the results found are likely to be due to the effect of the subject being studied and not by unrelated factors. Statistical significance differs from the substantive significance, or meaningfulness, of a finding. A result may be statistically significant but unimportant. Conversely, a result may not be statistically significant, but it may be meaningful because it suggest in important change in an outcome.
- Research findings are about groups: Research results are usually based on comparisons between two groups of people. While this can be useful in policy and decision-making, it is less relevant for individual cases. In addition to looking at the difference between the two groups, it is also worthwhile to look at the absolute levels in each group when deciding what the research indicates.
- All research is not created equal: When comparing the results from research with conflicting findings, higher-quality studies should be given more weight.
- Any one study is not the whole story: Any single study, no matter how good, needs to be viewed in the context of other research on the topic. If little or no other research exists, it is premature to assume the results apply to the population.

Endnotes

¹ Simons, Janet and Donna M. Jablonski, Children's Defense Fund, *An Advocate's Guide to Using Data*.

² Simons, Janet and Donna M. Jablonski, Children's Defense Fund, *An Advocate's Guide to Using Data*.

³ Illinois Voices for Children, *Information is Power: A Child Advocate's Guide to Fear-Free Fact Finding*.

⁴ Schaefer, Stephanie A., *Understanding Research: Top Ten Tips for Advocates and Policymakers*. Washington, SC: National Association of Child Advocates, 2001.



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The South Dakota KIDS COUNT Project

(www.sdkidscount.org) is a national and state-by-state effort, sponsored by the Annie E. Casey Foundation, to track the status of children in the United States. By providing policymakers and citizens with benchmarks of child well-being, KIDS COUNT seeks to enrich local, state, and national discussions concerning ways to secure better futures for children and families. Additional funding for the state project comes from the South Dakota Departments of: Education, Human Services, and Social Services.

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