

Telling Your Story with Data: Principles and Tools for Data Presentations

IHS Division of Diabetes Treatment and Prevention
Making Data Count – 2007 Data Conference (12/19/2007)

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Purpose of Data Presentations

To effectively communicate quantitative information (numbers).

Steps in Creating a Data Presentation

1. **Gather Data:** Data can come from many different sources, including
 - a. Patient charts (example: IHS Diabetes Care and Outcomes Audit)
 - b. Questionnaires (example: Special Diabetes Program for Indians grantee questionnaires)
 - c. Existing databases (RPMS)
2. **Analyze Data:** Use statistical methods to find the message in the data that you want to share. Some examples are:
 - a. Prevalence of diabetes is increasing in American Indians and Alaska Natives.
 - b. Mean HbA1c values in the Albuquerque Area have decreased over the last 5 years.
 - c. Since the beginning of the SDPI, more diabetes programs offer wellness activities.
3. **Communicate the Message in the Data:** Create the data presentation.

Selecting a Data Presentation Method

1. **Words:** Sometimes a message can be best communicated using a brief sentence or a bullet point. This method is best for expressing a single number or two.

Example: There was a 68% increase in diagnosed diabetes in American Indian and Alaska Native Youth from 1994-2004.

2. **Tables:** A table is an arrangement of information or data into columns and rows. The data are displayed as text and numbers. Tables are best for:
- Looking up individual values.
 - Comparing a few values.
 - Showing exact values.
 - Presenting data with different units of measure.

Example:

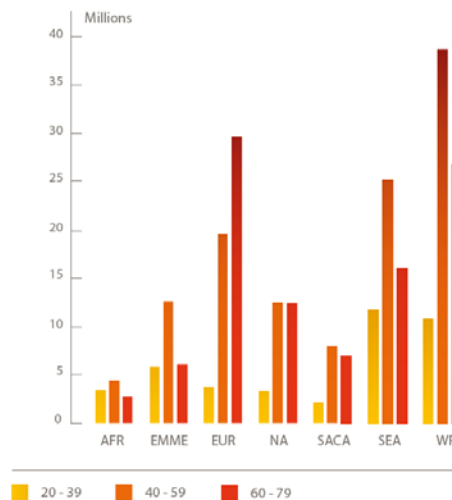
Appendix 3
Funding Amounts for the Special Diabetes Program for Indians Community-Directed Diabetes Programs
By IHS Area

Area	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
ABERDEEN	\$3,163,974	\$3,163,974	\$3,130,725	\$8,963,221	\$8,665,319	\$8,665,319	\$9,432,052	\$9,432,052	\$9,432,052	\$64,048,688
ALASKA	\$2,816,838	\$2,816,838	\$2,763,589	\$8,080,726	\$8,234,947	\$8,234,947	\$8,963,599	\$8,963,599	\$8,963,599	\$59,858,682
ALBUQUERQUE	\$2,274,460	\$2,274,460	\$2,241,204	\$6,979,237	\$6,724,242	\$6,724,242	\$7,395,069	\$7,319,223	\$7,319,223	\$49,251,360
BEMIDJI	\$2,298,507	\$2,298,507	\$2,298,507	\$7,392,572	\$7,145,000	\$7,145,000	\$7,777,210	\$7,777,210	\$7,777,210	\$51,909,723
BILLINGS	\$1,470,397	\$1,709,497	\$1,671,057	\$4,975,512	\$4,806,401	\$4,806,401	\$5,231,685	\$5,277,397	\$5,301,948	\$35,250,295
CALIFORNIA	\$1,107,729	\$1,570,591	\$1,523,245	\$4,910,618	\$5,238,371	\$5,238,371	\$6,344,378	\$6,338,378	\$6,338,378	\$38,610,059
NASHVILLE	\$1,443,862	\$1,443,862	\$1,410,614	\$4,263,941	\$4,399,740	\$4,399,739	\$5,462,036	\$5,462,036	\$5,461,903	\$33,747,733
NAVAJO	\$4,320,747	\$4,320,747	\$4,287,498	\$12,944,988	\$12,914,263	\$12,914,263	\$14,056,955	\$14,056,955	\$14,056,955	\$93,873,371
OKLAHOMA	\$4,787,735	\$4,787,735	\$4,754,486	\$15,899,979	\$16,615,789	\$16,117,178	\$17,950,277	\$18,908,010	\$18,908,010	\$118,729,199
PHOENIX	\$3,798,793	\$3,798,793	\$3,765,544	\$11,583,796	\$11,523,886	\$11,523,886	\$13,674,139	\$13,674,139	\$13,674,139	\$87,017,115
PORTLAND	\$1,592,172	\$1,592,172	\$1,558,473	\$4,917,519	\$4,972,408	\$4,960,035	\$5,734,543	\$5,734,543	\$5,728,734	\$36,780,599
TUCSON	\$769,542	\$674,156	\$736,293	\$2,281,660	\$2,332,831	\$2,332,831	\$2,539,246	\$2,539,246	\$2,539,246	\$16,745,051
URBAN	\$1,453,125	\$1,500,000	\$1,438,516	\$4,772,637	\$4,848,200	\$5,086,572	\$7,343,512	\$7,343,512	\$7,355,007	\$41,141,081
Total	\$31,297,861	\$31,951,332	\$31,599,751	\$97,966,406	\$98,421,397	\$98,138,784	\$111,904,701	\$112,826,300	\$112,856,404	\$726,962,956

3. **Graphs:** A graph is a visual display of quantitative information that can take many different forms. Commonly used types of graphs include line graphs, bar graphs, and scatter plots. Graphs are best for:
- Displaying relationships among multiple quantitative values by giving them shape.
 - Showing many data points with lots of variability.

Example:

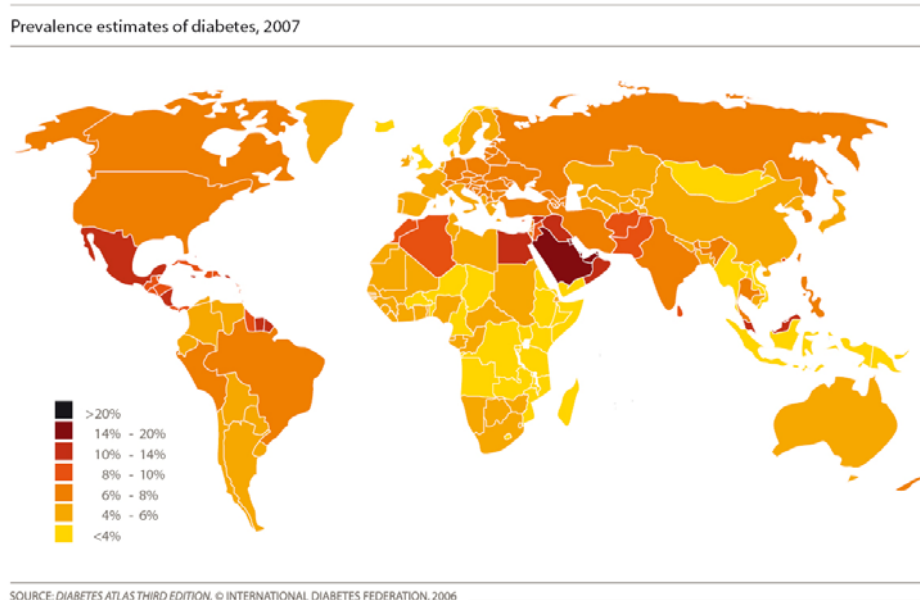
Number of people with diabetes in age groups by region, 2007



SOURCE: DIABETES ATLAS THIRD EDITION, © INTERNATIONAL DIABETES FEDERATION, 2006

4. **Maps:** A map is a visual representation of geographic features or geographic variations in data. Maps are best for showing geographic variation.

Example:



Principles of Good Data Presentation

“Above all else show the data.” – Edward Tufte

1. **Start with good, interesting data.** Good data comes from careful data collection.
2. **Carefully design the data presentation.** An effective data presentation has the following characteristics:
 - a. Emphasize the data, not the design.
 - i. Use colors that are distinct but not distracting.
 - ii. Minimize unnecessary graphical elements or information, such as pictures or uninformative decimal places.
 - iii. De-emphasize non-data elements (legends, axes, reference lines) by using light colors or shades and thin lines.
 - iv. No 3-D!
 - b. Well organized.
 - i. Include a brief but informative title.
 - ii. Use shading, headers, lines, white space, or other visual breaks to differentiate groups of information.
 - iii. Present information in an order that makes sense.

- c. Simple and concise but complete.
 - i. Use brief but clear labels for axes, legends, columns, rows, etc.
 - ii. Add words or labels to graphs for explanation as necessary.
 - iii. Don't use abbreviations in legends, labels, titles, etc.
- d. Truthful.
 - i. Use the same axis values for multiple graphs showing the same type of information.
 - ii. Give sufficient context for the data.
- e. Facilitate comparisons.
 - i. Show data for multiple groups or time periods on a single graph.
 - ii. Put things to be compared close together.
 - iii. Highlight important values or comparisons using color, size, or line thickness.

Tools for Creating Data Presentations

1. Selecting a Tool: Consider the following questions.

- a. What do you have?
- b. What do you know?
- c. What can you buy?
- d. Who will use it?

2. Some Available Tools

- a. Excel (office.microsoft.com)
- b. Harvard Chart (www.harvardgraphics.com/products/hqchartxl.asp)
- c. SAS (www.sas.com)
- d. JMP (www.jmp.com)

Resources

- a. www.edwardtufte.com
- b. Books by Edward Tufte
- c. Show Me the Numbers by Stephen Few