

California VitalPro User's Guide

ICD-10 Underlying Cause Deaths

Expert Health Data Programming, Inc.

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Chapter 1: Introduction

Nature of the software - Vitalnet is a health data warehouse / data analysis system. Vitalnet makes analyzing data faster, easier, and more reliable. This user's guide describes VitalPro, which runs directly on a PC or LAN.

Advice about user guide - We have made the software as self-explanatory as possible. You don't have to read this user's guide. If you pay attention to the menus, you can use the software. However, we recommend you read the user's guide: (1) Many users learn better from a written text. (2) It is helpful to have an overview of what the software can do, to know its capabilities, before using it. (3) The user's guide explains many concepts necessary for properly interpreting and using the data.

Tutorial - This user's guide incorporates a tutorial, to help you get started using the software. Tutorial sections are highlighted as shown in this example:

Sample Tutorial Step - Press 'A' to add California as one area set.

Organization - Here's how this user's guide is organized:

- **Chapter 1: Introduction** - Describes general characteristics of California VitalPro.
- **Chapter 2: Understanding Results** - Shows and explains typical VitalPro tables.
- **Chapter 3: Using VitalPro Interface** - Describes and shows how to use VitalPro menus.
- **Chapter 4: Outlines of Submenus** - Lists program menus and capabilities.
- **Chapter 5: Table Variables** - Explains how "table variables" (eg, rows) specify table layout.
- **Chapter 6: Data Variables** - Documents and explains variables such as race and age.
- **Chapter 7: Charts and Maps** - Explains map and chart (bar, line, pie) settings.
- **Chapter 8: Other Parameters** - Explains various other parameters (eg, cell suppression).
- **Glossary** - Defines terms related to mortality data and VitalPro.

Citation for VitalPro - Expert Health Data Programming, Inc., California VitalPro User's Guide: Data Warehouse Software for Analyzing California ICD-10 Underlying Cause Deaths. Bellevue, Washington. 1998-2015. Browse www.ehdp.com for more information about the software or to contact EHDP.

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1-1: Advantages and Benefits

• **VitalPro makes it easy to analyze California mortality data.**

Fast - You get results in seconds or minutes. Depending on the analysis, alternate methods could easily require hours or days to complete.

Reliable - VitalPro helps prevent mistakes. It automatically incorporates needed complex algorithms and relationships. In contrast, analyses with SAS, SPSS, and other generic stats software are error-prone (besides being quite tedious). There are many steps that can go wrong in trying to manually analyze data.

Flexible - A wide variety of tables, charts and maps may be produced. You may set table rows and columns however you want. A large number of table, map, chart, and data parameters may be selected and combined as needed. On the other hand, if you choose you can ignore most program options, as they are set to reasonable default values.

Efficient - VitalPro goes beyond just being fast. For example, you can automatically make a whole series of tables with one keystroke (multi-tables), such as a separate table for each county. As another example, chart output is automatically produced whenever it makes sense, but NOT produced when it would look terrible or be invalid.

Easy to use - All operations are menu-driven, so you don't need to do tedious scripting. And you don't need to know any special codes such as FIPS codes.

Has online help - If needed, context-sensitive help is available from each menu. In addition, you may select from a list of on-line help topics, providing advice on topics related to VitalPro and data analysis. The on-line help complements the information in this user's guide. Useful on-line reference materials are also provided, such as tables of standard populations used for age-adjustment.

Fully documented - VitalPro output helps prevent data misinterpretation. All output is fully documented, so (1) there is no confusion or question about the exact analysis that was done, and (2) the analysis can be exactly replicated if needed.

Makes charts and maps - VitalPro automatically makes charts (bar, line, and pie) and maps. The charts and maps can be customized in a wide variety of ways, as explained later.

Integrates with other software - VitalPro automatically displays HTML output in your desktop browser. And the HTML may be imported into word processing software. In addition, the following alternative formats are automatically made along with each analysis, to allow importing the results into other software tools: (1) ASCII text format, (2) delimited format for importing into spreadsheets, (3) dBASE III format for importing into statistical, GIS, mapping, graphing and other software, (4) both PNG and PDF map formats.

Can be customized - Let us know if other capabilities you would like added. We want to further improve Vitalnet to meet your needs.

1-2: Data Within the Program

• **This program links and analyzes geographic, population, mortality, and ICD-10 data.**

Geographic information - This program includes a database of California counties and Health Service Areas, linked to the population and mortality data sets. Boundary files are included for making maps.

Population data - The population variables included within the program are age, county of residence, race, sex, and year. Population figures are used for calculating death rates. A separate Vitalnet interface, PopTrend, analyzes population data for demographic trends, and to obtain denominators for analyzing other data sets.

Mortality data - The Center for Health Statistics at the California Department of Health Services provides all California mortality data. For an estimate on when the next data file will be loaded, contact the Center. Mortality variables within the program include age of deceased, cause of death, county of residence, race, sex, and year.

Place of residence - The program analyzes by place of residence of the deceased. For example, if a Sacramento resident died in a motor vehicle collision in Los Angeles, The program would classify the death under Sacramento. Standard mortality reports usually use place of residence (the other system is "place of occurrence").

Underlying cause - The program analyzes by underlying cause (the cause which initiated the sequence of events leading to death). For example, if a death certificate lists rheumatoid arthritis, myocardial infarction (MI), and cardiac arrhythmia secondary to MI, the underlying cause is MI. A separate program (MultiCod) analyzes multiple cause mortality data.

ICD information - The ICD (International Classification of Diseases) is the standard system for classifying causes of injury, illness and death. The program includes a complete database of the ICD system, for selecting and combining causes of death to analyze. For example, you can easily determine the leading causes of death or select any combination of ICD codes for analysis. The ICD-10 system is used starting with 1999 mortality data. Mortality data for 1980 to 1998 use the ICD-9 system. VitalPro operation is the same with ICD-9 or ICD-10 data, so there is no separate user guide for analyzing ICD-9 death data.

Data linking - Four data sets (geographic data, population data, mortality data, and ICD data) are linked with each other into the VitalPro data warehouse.

1-3: Accessing the Program

- **Access VitalPro on a standalone PC or via LAN.**

Local access (PC's and local area networks) - You may use California VitalPro on a stand-alone PC or laptop running any version of Windows. California VitalPro may also be run from a local area network. Generally, VitalPro runs faster from a standalone installation, since it does not have to send data over the network.

Execution speed - VitalPro is fast. The program has been tested to produce rapid results on any Windows PC, and simply runs faster on faster computers. Analyses that might otherwise take hours to days to set up and run are done in seconds or minutes.

The program execution speed depends on: (1) the type of PC you are using, (2) the characteristics of the network you are working on, (3) the specific analysis. It typically takes a second or two to generate output.

1-4: Confidentiality Policy

- **California VitalPro users must comply with confidentiality requirements.**

Confidentiality policy - Your use of California VitalPro indicates your agreement to the following conditions: You will not try to use California VitalPro results nor let anyone else use California VitalPro results to learn the identity of a reported death, or for any purpose other than statistical analysis. If you discover the identity of a reported death, you will advise the Director of the Center for Health Statistics at the California Department of Health Services of the incident, will safeguard or delete the information that would identify the individual, will make no use of the knowledge, and will inform no one else of the discovered identity.

Cell suppression - If you so desire, California VitalPro can suppress cells that have fewer than a user-defined number of death. Cell suppression can increase the confidentiality of written reports in some cases. Cell suppression is described more fully later.

Chapter 2: Understanding Results

What's in this chapter - Before jumping in and using the program (next chapter), it is advised to get a good understanding of the results of the program. This chapter explains the organization and content of VitalPro tables.

This chapter explains the four sections of a VitalPro table:

- **Header** - Basic analysis parameters.
- **Data section** - Numerical results.
- **Bar graphs** - Graphical results.
- **Footnotes** - Other analysis parameters.

In addition, this chapter shows examples of actual California VitalPro tables, to give you an idea of what is possible. You are given an opportunity to practice interpreting sample tables.

2-1: Typical VitalPro Table

- Each table has four parts: header, data section, tabular chart, footnotes.

```
Deaths
Tabulated by Age and Sex
Years: 1999
Place of Residence: Imperial, San Diego
ICD J40-J47: Chronic lower respiratory diseases
```

Age	Male	Female	Total
Birth-19	3	2	5
20-39	3	1	4
40-59	25	36	61
60-99+	521	593	1,114
Total	552	632	1,184

Horizontal Bar Graphs (X = 39.5 Deaths, x = 19.8):

Age	Male	Female
Birth-19		
20-39		
40-59	x	X
60-99+	XXXXXXXXXXXXX	XXXXXXXXXXXXX

```
Analysis Footnotes:
Unique ID, for Keeping Track of Analyses: 507PMAZC
Output Produced: Mon May 07 14:58:58 2001, by California VitalNet
Deaths Classified by: ICD-10, Underlying Cause, County of Residence
Mortality Data Source: DHS Office of Health Information and Research
```

Header: Documents the analysis. The table analyzes deaths for 1999 for two counties: Imperial and San Diego. Chronic lower respiratory disease (ICD J40-J47) is analyzed.

Data Section: Contains the results, organized into columns and rows. In this example, there is one column for each sex and one row for each of four age groups. Verify there were 36 deaths in women age 40-59, 552 deaths in males, and a total of 1,184 deaths. Each result, such as 36, 552, and 1,184, is called a "cell".

Tabular Chart: Represents the results in a simple graphical format. In this example, each 'X' (big X) symbol represents 39.5 deaths. The tabular charts are optional. The tabular chart clearly shows that the great majority of deaths in this analysis were in the 60-99+ age group, for both sexes.

Footnote: Documents less important aspects of the analysis, such as when the table was produced. Assigns a unique ID to the table for future reference.

2-2: Table #1 to Interpret

Here is a sample table (footnotes omitted) for you to practice on. Try interpreting the table by filling in the spaces below. Then, check your answers with those on the next page.

Death Rate (per 100,000)
Tabulated by Area Set and Sex
Age: 20-39 Years
Years: 1999
Place of Residence: Hlth Serv Area 5, Hlth Serv Area 11, Hlth Serv Area 12
ICD B20-B24: Human immunodeficiency virus [HIV] disease

Area Set	Male Rate, Deaths	Female Rate, Deaths	Total Rate, Deaths
Hlth Serv Area 5	10.1 35	2.1 7	6.2 42
Hlth Serv Area 11	13.0 202	2.5 35	8.0 237
Hlth Serv Area 12	8.5 40	2.5 11	5.6 51
Total	11.7 277	2.4 53	7.2 330

Horizontal Bar Graphs (X = 0.9 Deaths / 100,000, x = 0.4):

Area Set	Male Rate	Female Rate	Total Rate
Hlth Serv Area 5	XXXXXXXXXXx	XXx	XXXXXXXX
Hlth Serv Area 11	XXXXXXXXXXXXXXXXXX	XXX	XXXXXXXXXX
Hlth Serv Area 12	XXXXXXXXXX	XXX	XXXXXXx
Total	XXXXXXXXXXXXXXx	XXX	XXXXXXXXXXx

Header

Outcome (main statistic):
Years analyzed:
Geographic areas analyzed:
ICD groups analyzed:
Age groups analyzed:

Data Section

Rows variable:
Columns variable:
How many females died in HSA 11:
Death rate for males in HSA 12:

Tabular Chart

Death rate symbolized by big 'X':

2-3: Table #1, Interpreted

Here is the same table, and a suggested interpretation. If you had a problem, try reading through the answers again or ask a local data analyst for help.

Death Rate (per 100,000)
Tabulated by Area Set and Sex
Age: 20-39 Years
Years: 1999
Place of Residence: Hlth Serv Area 5, Hlth Serv Area 11, Hlth Serv Area 12
ICD B20-B24: Human immunodeficiency virus [HIV] disease

Area Set	Male Rate, Deaths	Female Rate, Deaths	Total Rate, Deaths
Hlth Serv Area 5	10.1 35	2.1 7	6.2 42
Hlth Serv Area 11	13.0 202	2.5 35	8.0 237
Hlth Serv Area 12	8.5 40	2.5 11	5.6 51
Total	11.7 277	2.4 53	7.2 330

Horizontal Bar Graphs (X = 0.9 Deaths / 100,000, x = 0.4):

Area Set	Male Rate	Female Rate	Total Rate
Hlth Serv Area 5	XXXXXXXXXXx	XXx	XXXXXXXX
Hlth Serv Area 11	XXXXXXXXXXXXXXXXXX	XXX	XXXXXXXXXX
Hlth Serv Area 12	XXXXXXXXXX	XXX	XXXXXXx
Total	XXXXXXXXXXXXXXx	XXX	XXXXXXXXXx

Header	Outcome (main statistic):	Death rate (per 100,000)
	Years analyzed:	1999
	Geographic areas analyzed:	Health Service Areas 5, 11, 12
	ICD groups analyzed:	ICD B20-B24 (HIV/AIDS)
	Age groups analyzed:	20-39
Data Section	Rows variable:	Row for each area set
	Columns variable:	Column for each sex
	How many females died in HSA 11:	35
	Death rate for males in HSA 12:	8.5 per 100,000
Tabular Chart	Death rate symbolized by big 'X':	0.9 per 100,000

2-4: Table #2 to Interpret

Here is another table. Fill in the spaces below. Then, check your answers on the next page.

Age-Adjusted Death Rate (per 100,000)
Age Adjustment Standard Population: 2000 US
Tabulated by Race-Ethnicity and Sex
Years: 1999
Place of Residence: California
ICD C33: Malignant neoplasm of trachea
ICD C34: Malignant neoplasm of bronchus and lung

Race	Male Rate, Deaths		Female Rate, Deaths		Total Rate, Deaths	
Am Indian	36.0	26	20.3	19	27.0	45
Asian/PI	44.0	554	23.0	360	32.3	914
Black	94.9	633	46.4	423	66.2	1,056
Hispanic	28.9	550	13.2	327	20.0	877
White	66.2	5,794	44.6	5,063	53.6	10,857
Total	59.6	7,557	37.6	6,192	46.9	13,749

Overall Unknown Age for Rows (Not Added to Row Totals): 2 Total
Overall Unknown Age for Columns (Not Added to Column Totals): 2 Total

Horizontal Bar Graphs (X = 6.3 Deaths / 100,000, x = 3.1):

Race	Male Rate	Female Rate	Total Rate
Am Indian	XXXXXx	XXX	XXXXx
Asian/PI	XXXXXXXX	XXXx	XXXXX
Black	XXXXXXXXXXXXXXXX	XXXXXXXXx	XXXXXXXXXXx
Hispanic	XXXXx	XX	XXX
White	XXXXXXXXXXx	XXXXXXX	XXXXXXXXXXx
Total	XXXXXXXXXXx	XXXXXXX	XXXXXXXXXXx

Header

Outcome (main statistic): _____
Years analyzed: _____
Geographic areas analyzed: _____
ICD groups analyzed: _____

Data Section

Rows used in this example: _____
Columns used in this example: _____
How many Black males died: _____
Death rate for Hispanic females: _____
Overall death rate: _____

Tabular Chart

Death rate symbolized by big 'X': _____

2-5: Table #2, Interpreted

Here is the second table again, and our interpretation of the results.

Age-Adjusted Death Rate (per 100,000)						
Age Adjustment Standard Population: 2000 US						
Tabulated by Race-Ethnicity and Sex						
Years: 1999						
Place of Residence: California						
ICD C33: Malignant neoplasm of trachea						
ICD C34: Malignant neoplasm of bronchus and lung						
Race	Male		Female		Total	
	Rate,	Deaths	Rate,	Deaths	Rate,	Deaths
-----	-----	-----	-----	-----	-----	-----
Am Indian	36.0	26	20.3	19	27.0	45
Asian/PI	44.0	554	23.0	360	32.3	914
Black	94.9	633	46.4	423	66.2	1,056
Hispanic	28.9	550	13.2	327	20.0	877
White	66.2	5,794	44.6	5,063	53.6	10,857
-----	-----	-----	-----	-----	-----	-----
Total	59.6	7,557	37.6	6,192	46.9	13,749

Overall Unknown Age for Rows (Not Added to Row Totals): 2 Total						
Overall Unknown Age for Columns (Not Added to Column Totals): 2 Total						
Horizontal Bar Graphs (X = 6.3 Deaths / 100,000, x = 3.1):						
Race	Male		Female		Total	
	Rate		Rate		Rate	
-----	-----	-----	-----	-----	-----	-----
Am Indian	XXXXXx		XXX		XXXXx	
Asian/PI	XXXXXXXX		XXXx		XXXXX	
Black	XXXXXXXXXXXXXXXXXX		XXXXXXXXx		XXXXXXXXXXx	
Hispanic	XXXXx		XX		XXX	
White	XXXXXXXXXXx		XXXXXXX		XXXXXXXXXXx	
-----	-----	-----	-----	-----	-----	-----
Total	XXXXXXXXXXx		XXXXXX		XXXXXXXXXXx	

Header	Outcome (main statistic):	Age-adjusted death rate
	Years analyzed:	1999
	Geographic areas analyzed:	California
	ICD groups analyzed:	ICD C33-C34
Data Section	Rows used in this example:	Row for each race
	Columns used in this example:	Column for each sex
	How many Black males died:	633
	Death rate for Hispanic females:	13.5 per 100,000
	Overall death rate:	46.9 per 100,000
Tabular Chart	Death rate symbolized by big 'X':	6.3 per 100,000

Chapter 3: Using VitalPro Interface

What's in this chapter - Finally, you will get to use the program! This is probably what you have been waiting for! You will learn to navigate the interface, select parameters, and produce a few tables like those you learned about in the previous chapter.

Some advice about learning - As you use the program, we encourage you to explore and try things. Don't be shy. You cannot cause any damage by using the program. The program does a lot, and there are a lot of options, because analyzing data has lots of options. But running the program is pretty simple, once you know the basic way it works.

Open default browser - Your PC has a "default browser" set up. That's the browser that normally displays HTML files (web pages) for you. Before you start VitalPro, open the default browser. Eventually, when you make output from VitalPro, the output will display in the browser. The preferred browsers are Firefox, Internet Explorer, Safari, and Opera. Chrome has a bug, does not display local files via Javascript, so Chrome fails to display time trend maps.

Access the program - A tutorial runs through this chapter. All procedures you are expected to do as part of the tutorial are highlighted in a different type style, as shown below. At this point, do the following:

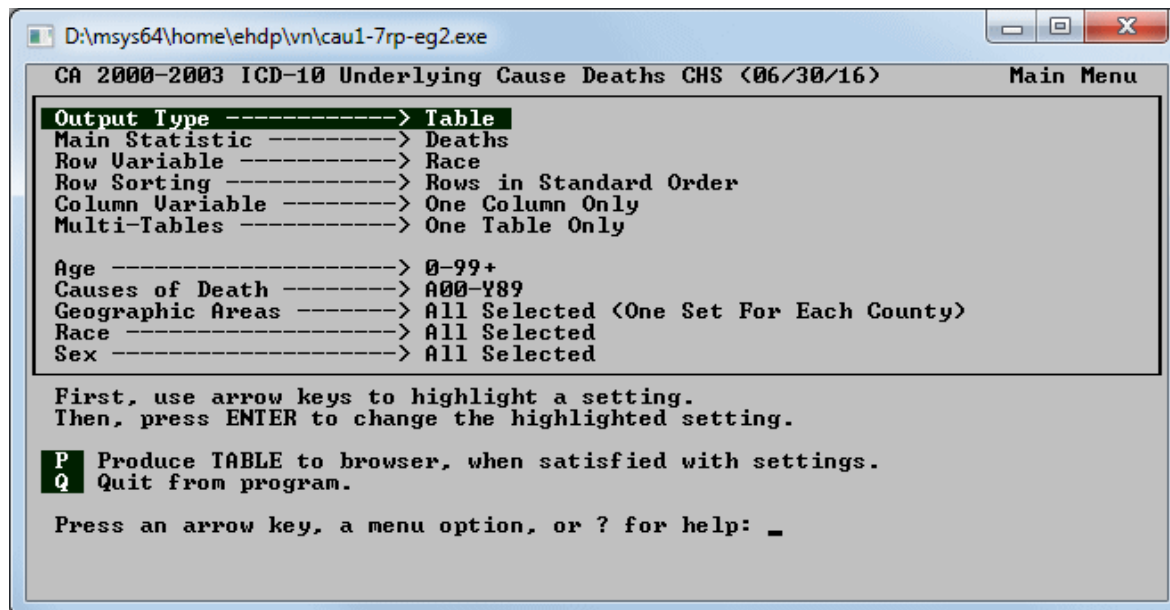
Start California VitalPro by clicking on the icon.

The icon may look like a doctor's bag, or may be a different desktop icon. If you do not have an icon, ask your network manager to set things up to start VitalPro from an icon. If you can't start the program or have some other issue, get assistance from another California VitalPro user. Or, contact us.

VitalPro runs in a "Win32 Console". This is a special interface available on all Windows computers. You will start at the Main Menu (shown on next page).

3-1: Start at Main Menu

- You will constantly return to the Main Menu.



After VitalPro starts in the Win32 Console, you are presented with the Main Menu, as shown above.

The Main Menu is the "command center" - You move to submenus to modify parameters, but return to the Main Menu to make a table (or map). The Main Menu lists all parameters currently selected. It provides an overview of the current analysis scenario.

Highlighting a parameter - One of the parameters is always highlighted. In the example above, "Output Type" is highlighted. You move the highlight by pressing an arrow key. The parameter list scrolls as needed. Note that you do not use a mouse to run the program. This "non-mouse" operation may seem odd at first, but it proves to be faster and easier. Do the following:

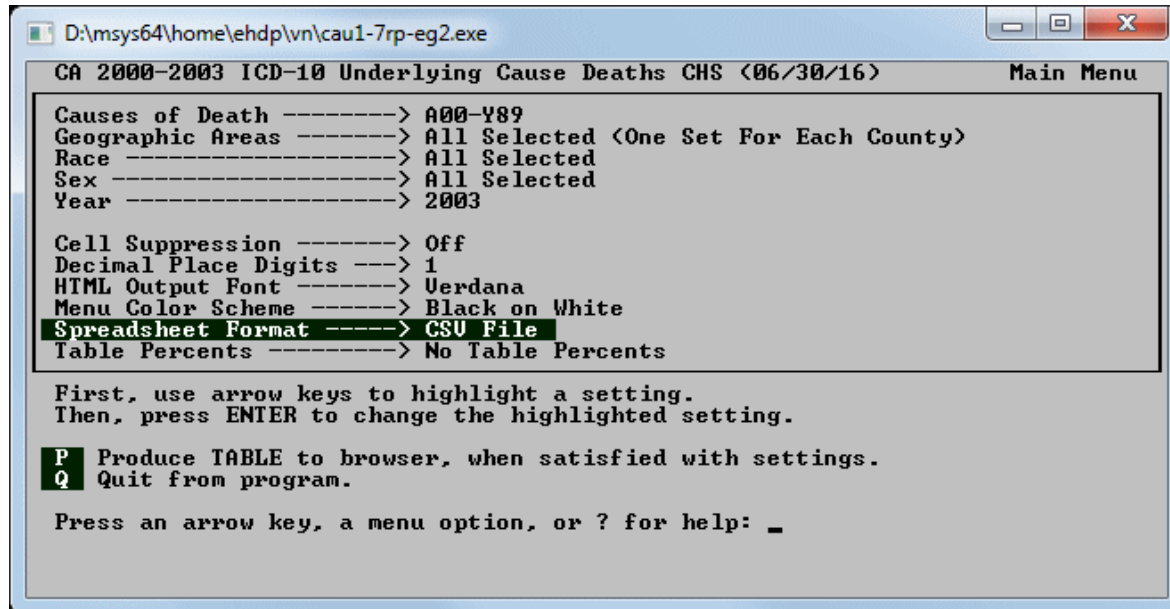
Press "down arrow key" to move the highlight down.
Keep pressing "down arrow key" to scroll down more.

The menu tells you what to do - Every VitalPro menu has text at the bottom with guidance on what to do next. For example, the Main Menu text indicates you can press an arrow key (move highlight), the ENTER key (change highlighted setting), P (produce output), Q (quit), or '?' (help).

Changing window appearance - The font size for the Win32 Console running VitalPro may be changed from the Win32 Console toolbar, to suit your screen. The size "8 x 12", as shown, is a reasonable size. Also, the Win32 Console may be toggled to full screen (and back) by pressing ALT-ENTER (hold down ALT key and press ENTER key).

3-2: Use a Simple Submenu

- Access a submenu by highlighting an item and pressing ENTER.



Selecting parameter to change - To change a parameter, highlight the parameter (using the arrow keys) and press ENTER.

Quick changes - Some parameters have a very simple submenu. Try this:

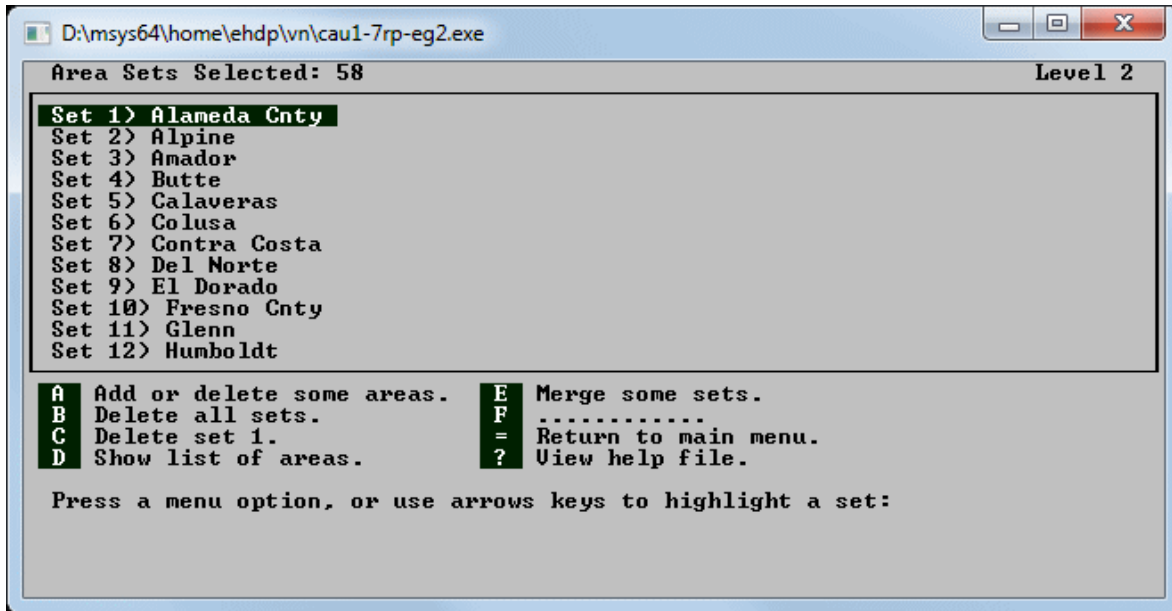
Highlight "Spreadsheet Format" by using arrow keys.
Press ENTER to access the submenu. Select TSV format.
Press ESCAPE (or '=') to return to the Main Menu.

More complex changes - For more complex parameters, a more complicated submenu will appear and help you change the parameter. For example, to change the geographic selection, you would highlight the parameter "Geographic Areas", and press ENTER. Do the following:

Use arrows keys to highlight "Geographic Areas".
Then, press ENTER to access the Area Sets submenu.

3-3: Use Geographic Submenu

- Each submenu guides you step-by-step in selecting parameters.



Submenu with scrolling window - This is a typical VitalPro submenu. It has a scrolling window with a list of items, "area sets" in this case. One or more of the items may be highlighted by using the arrow keys.

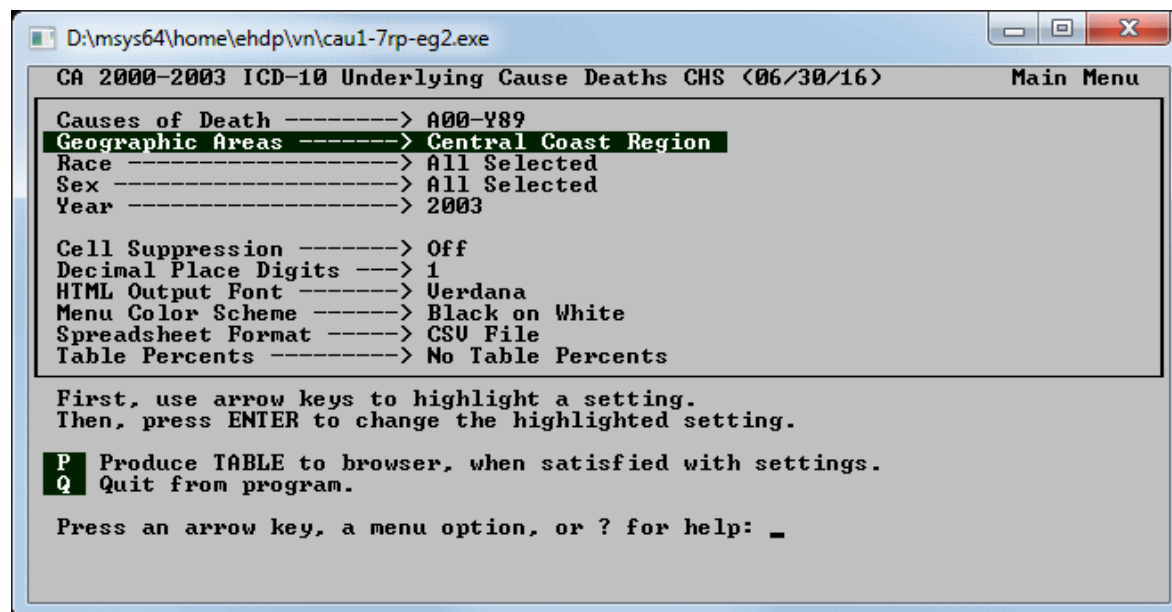
Letters are action items - This submenu has a list of actions, such as "**B** Delete all sets". Pressing the letter (such as 'B') carries out the action.

Adding an area - Carry out the following steps to add an area:

1. Press 'B' to delete all areas sets. Confirm if asked.
2. Then, press 'A' to add some areas.
3. Highlight "Central Coast Region", and press ENTER to add.
4. Then, press ESCAPE (or '=') to return to area set menu.
5. Note that an item is added to the scrolling window.
6. Finally, press ESCAPE (or '=') to return to the Main Menu.

3-4: Back at Main Menu

- Access a submenu by highlighting an item and pressing ENTER.



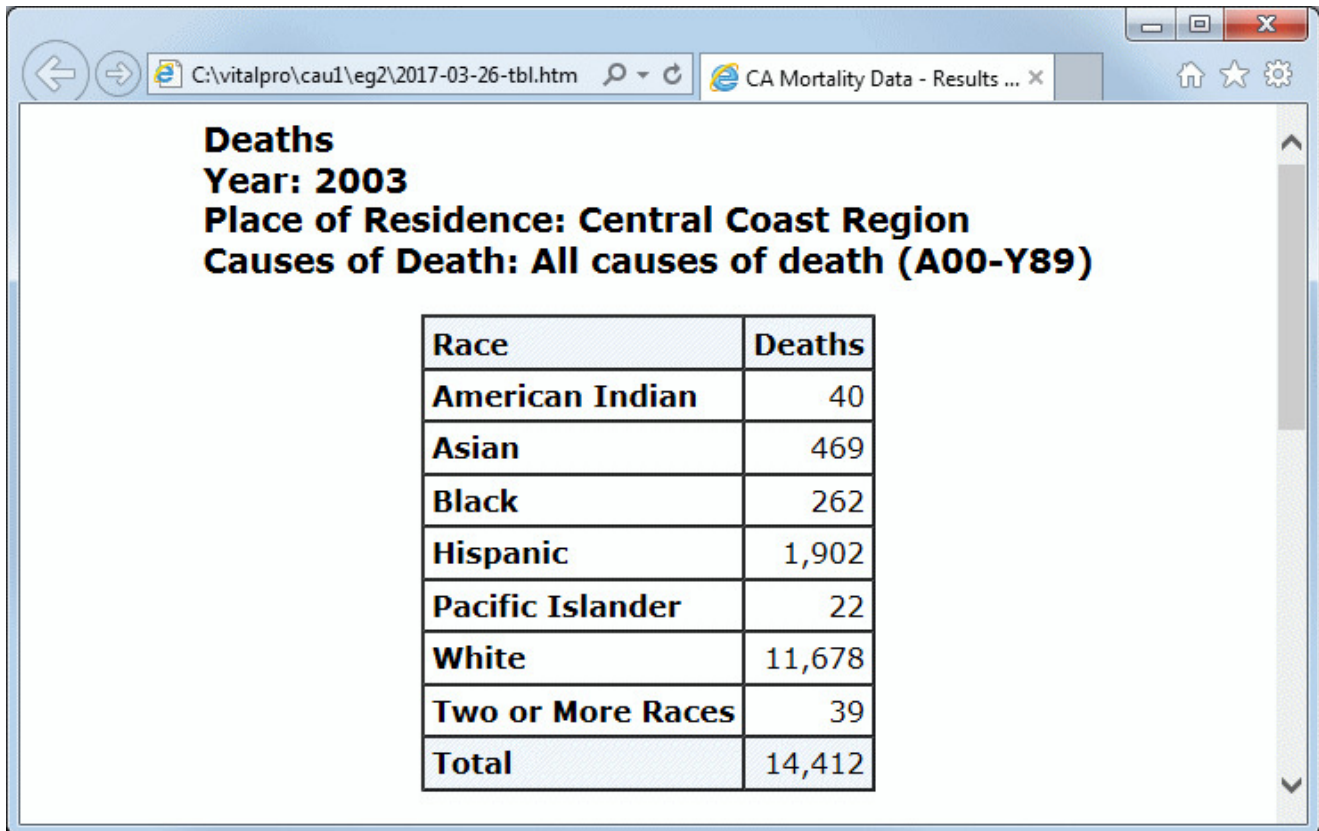
Make sure you're back - You should now be back at the Main Menu. Note that "Geographic Areas" has been modified (it is now set to Central Coast Region). If you are not back at the Main Menu, get assistance from a co-worker familiar with using California VitalPro. Or (in almost all cases), simply press the ESCAPE key a few times.

3-5: Produce a Table

• Press 'P' at the Main Menu to make a table.

Check that you at the Main Menu - You should now be back at the Main Menu. You have used the submenus to select a few parameters, and are now ready to produce your first table!

Press the letter 'P' to produce a table similar to the following (bottom of table not shown):



The screenshot shows a web browser window with the address bar displaying 'C:\vitalpro\cau1\eg2\2017-03-26-tbl.htm'. The browser title is 'CA Mortality Data - Results ...'. The main content area displays the following text:

Deaths
Year: 2003
Place of Residence: Central Coast Region
Causes of Death: All causes of death (A00-Y89)

Below this text is a table with two columns: 'Race' and 'Deaths'.

Race	Deaths
American Indian	40
Asian	469
Black	262
Hispanic	1,902
Pacific Islander	22
White	11,678
Two or More Races	39
Total	14,412

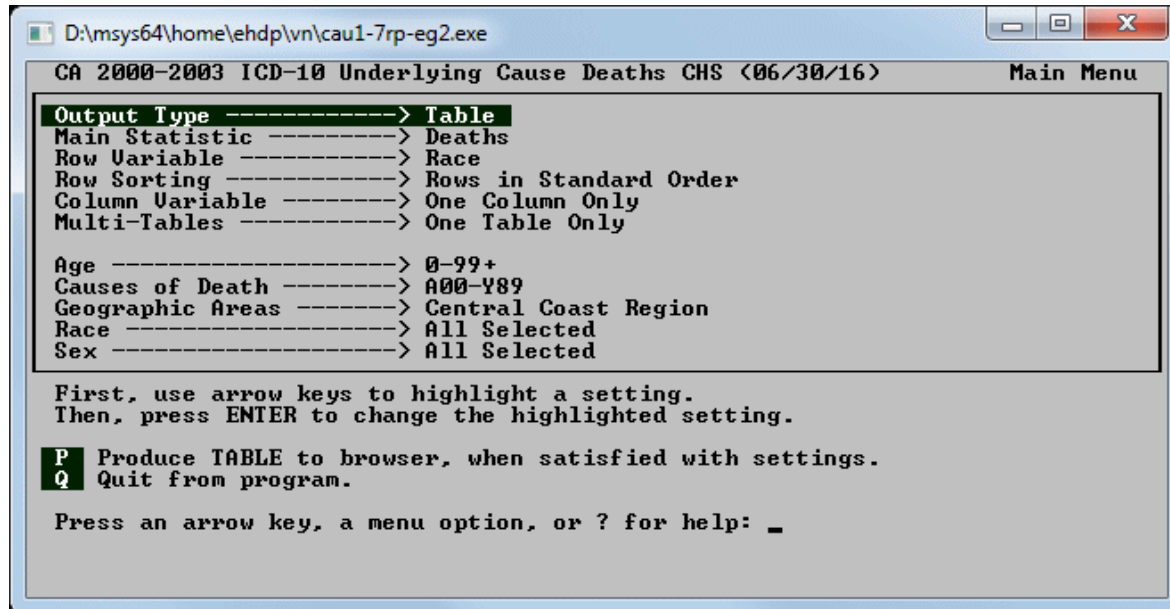
Time required - The amount of time required depends on which parameters are selected and what kind of computer you are using, but is typically a few seconds.

Examining the table - The output will automatically appear in your default desktop browser (which you previously had open). The bottom of the output (not shown above) contains links to spreadsheet, text, and dBASE III output. There may be links to bar, pie, or line chart output.

1. View (and print) the output in your browser.
2. Click on some of the links at the bottom of the output.
3. If desired, delete the browser window (CTL-W).
4. Click on the VitalPro Main Menu to return to the program.

3-6: Switch to Designing a Map

- At any time, you may switch to designing a map.



You've got the basics - You've navigated the VitalPro Main Menu, used submenus to select parameters, made an output table, and viewed the output. That's about all there is the basic operation of VitalPro! It's a simple, fast, powerful analysis cycle. You should be getting the hang of the program by now. If not, talk with a coworker or contact us.

PNG and PDF maps - VitalPro also makes PNG and PDF maps. You can customize the maps in a wide variety of ways to meet your needs: add area labels, switch between boundary types (eg, regional boundaries), set the number of colors to use, select a color palette, set the range type (eg, "equal interval"), select time trend maps (map for each year range). These options are described and illustrated later in the user guide.

Make a map - Since tables and maps are so fundamentally different (eg, maps don't have rows, tables don't have colors), VitalPro displays a different menu system when designing a map. To make your first map:

1. At the main menu, highlight "Output Type" (first option).
2. Press ENTER, and on submenu select "Map" as output type.
3. Back on the main menu, press "P" to produce a typical map.

3-7: Continue with Analyses

• **VitalPro lets you quickly carry out a wide variety of analyses.**

Explore the menus - Once you get the hang of it, using VitalPro is pretty easy. If you have gotten this far, you understand the basic program operation. Don't be afraid to experiment and try out different options. Once you have made a table (or map), look it over. If it meets your needs, you're done. If the output is not quite right, look over the parameters on the Main Menu, highlight the parameter you want to change, and press ENTER. A submenu will lead you through the modification process. After setting all parameters as desired, return to the Main Menu and produce another table (or map) by pressing 'P'. Try it:

1. At the Main Menu, modify a parameter or two.
2. Then press 'P' to produce and view another output table.
3. Try some of the sample analyses shown later.

On-line help - VitalPro has been designed to be as self-explanatory as possible. However, it also includes extensive on-line help. To access on-line help from any menu, press '?'. A help screen will appear, with information related to the current menu. After viewing the help screen, a scrolling list of help topics may be viewed, for your selection. Try it:

At the Main Menu, press '?' and explore the help system.

Quitting VitalPro - The '=' or ESCAPE key always returns to the previous menu. Later, when you are done, you may press the 'Q' key from the Main Menu to quit VitalPro.

Some suggestions for avoiding misinterpretation:

- Double-check header and footer to verify it was the analysis you intended.
- Double-check ICD codes to make sure they are the causes of interest.
- Use age-adjusted rates to compare rates between different populations.
- Use fewer rows and columns for simpler presentation.
- Use more rows and columns if more comparisons and detail needed.
- Acknowledge limitations in accuracy of the cause of death.
- Acknowledge possible changes in coding practices by certifiers.
- Acknowledge the possibility of census miscounts.
- Acknowledge difficulty estimating population in years between censuses.
- Use confidence intervals to help determine statistical significance.
- If uncertainties remain, contact local data experts for advice.

3-8: More Practice Analyses

For additional practice, and to gain more understanding of how California VitalPro can speed and simplify data analysis, carry out the following sample analyses. If a variable is not listed (eg, Sex), then all values are selected (eg, Male and Female). Do the following:

For each analysis, select the parameters as shown below.
Then, press 'P' from the Main Menu to produce output.

1. Table - Current leading causes of death for California:

ICD sets - NCHS rankable causes	Area sets - California	Statistic - Deaths
Row sort - Sorted high to low	Row for each - ICD set	Column for each - Sex
Table for each - One only	Years - Most recent year	

2. Table - Current stroke age-specific death rates for Sacramento:

Statistic - Death rate	ICD sets - I60-I69	Year - Most recent
Row for each - Age group	Area sets - Sacramento	Column for each - Sex
Table for each - One only	Ages - 10-year groups	

3. Table - Current lung cancer death rates ranked by region:

Statistic - Age-adjusted rate	Row for each - Area set	ICD sets - C33-C34
Adjustment standard - 2000 US	Table for each - One only	Column for each - Sex
Row sort - Sorted high to low	Area sets - All regions	Year - Most recent

4. Table - Diabetes time trends, one table for each race:

Statistic - Age-adjusted rate	Row for each - Year	ICD sets - E10-E14
Adjustment standard - 2000 US	Table for each - Race	Column for each - Sex
Area sets - California	Years - All years	

5. Map - Diabetes geographic distribution:

Statistic - Crude death rate	ICD sets - E10-E14
Color Palette - Diverging Blue-Red	Boundaries - Counties
Area sets - California	Years - Most recent

6. Map - Diabetes geographic distribution:

Statistic - Crude death rate	ICD sets - E10-E14
Color Palette - Diverging Blue-Red	Boundaries - Counties
Area sets - California	Years - Most recent

Chapter 4: Outlines of Submenus

What other menus and options are available? - If you have done the examples in the previous chapter, you should have a good understanding of how to use VitalPro menus to select parameters. However, you have just scratched the surface of the capabilities and power of VitalPro. For your reference, the following pages list all of the California VitalPro menus. The purpose of the list of menus is to help you become aware of what is available so that you can take fullest advantage of the software. Do this:

Viewing the outlines on the next pages, explore VitalPro menus.

First, design table layout:

- Statistic Menu
- Row Variable Menu
- Row Sorting Menu
- Column Variable Menu
- Multi-Tables Menu

Next, modify data variables:

- Age Groups Menu
- Area Sets Menu
- Cause of Death Menu
- Race Groups Menu
- Sex Menu
- Year Ranges Menu
- Other Settings from Main Menu

When ready, carry out an action:

- Produce Table and Charts
- Produce Map
- Exit VitalPro

4-1: Table Layout Submenus

- Using California VitalPro, explore menus for designing table layout.

Statistic Menu sets type of result:

- Deaths
- Death Rate
- Age-Adjusted Death Rate
- Mean Age of Death
- Standardized Mortality Ratio
- Years of Potential Life Lost
- Years of Life Lost Rate

Row Menu selects "Row Variable":

- Age
- Education
- Hispanic Origin
- Injury at Work
- Marital Status
- Place of Occurrence
- Place of Residence
- Race
- Sex
- Type of Place of Death
- Underlying Cause
- Year

Column Menu has same options.
Multi-Table Menu has same options.

Row Sorting Menu options:

- Rows unsorted
- Rows sorted by total data, high to low
- Rows sorted by total data, low to high

4-2: Data Variable Submenus

- Using California VitalPro, explore menus for modifying variables.

Race Menu / Sex Menu:

- Select categories as sets
- Delete one / all sets
- Merge sets into new set
- Split previously merged set

Year Ranges Menu:

- Use standard grouping, eg 2-year
- Extend upper / lower end of range
- Split range into individual years
- Delete a year range

Age Groups Menu:

- Use standard grouping, such as 10-year
- Extend upper / lower end of group
- Split group into separate groups
- Delete an age group

Area Sets Menu:

- Add some areas (submenu)
- Delete one / all area sets
- Merge area sets into new set
- Split area set into sub-areas
- Show and print list of areas

Cause of Death (ICD) Menu:

- Add from list menu (common causes)
- Add from tree menu (all ICD codes)
- Add single ICD range (all ICD codes)
- Show (to browser) list of ICD codes
- Delete one / all ICD sets
- Merge ICD sets into new set
- Split ICD set into ICD groups

Other Main Menu Settings:

- Age-Adjust Standard
- SMR Standard
- YPLL Age Limit
- HTML Output Font
- Spreadsheet Format
- Tabular Chart
- Unique ID
- Cell Confidence Level
- Cell Suppression
- Decimal Place Digits
- Table Percents
- Trend Confidence Level
- Bar, line, and pie chart settings
- Map settings
- Output directory
- Output file prefix

4-3: Checklist of Key Tasks

This checklist gives an overview of the main capabilities of the software, and the tasks you would normally do to analyze the data.

Table layout:

- Select outcome (main statistic)
- Select row variable and sorting
- Select column variable
- Select multi-tables (table series)

Age groups:

- Select grouping (eg 5-year groups)
- Split a group (eg, 10-11 --> 10 + 11)
- Delete a group

For low end of age group:

- Decrease (eg, 11-13 --> 10-13)
- Increase (eg, 11-13 --> 12-13)

For high end of age group:

- Decrease (eg, 10-12 --> 10-11)
- Increase (eg, 10-12 --> 10-13)

Viewing output:

- Produce output from main menu
- View HTML output in browser
- View text output in browser
- View pie / bar / line charts
- View CSV / TSV in spreadsheet

Other tasks:

- Switch to designing a map
- Switch to designing a table
- Change output directory
- Change output prefix
- Use help system

Race sets:

- Select some race sets
- Delete a race set
- Merge some sets
- Split a race set

Area sets:

- Select some area sets
- Delete an area set
- Merge some sets
- Split an area set

ICD sets:

- Select some ICD sets
- Delete an ICD set
- Merge some sets
- Split an ICD set

Chart and map settings:

- Modify bar chart settings
- Modify line chart settings
- Modify pie chart settings
- Modify map settings

Other settings:

- Change decimal places
- Turn on / set cell suppression
- Turn on / set confidence intervals
- Turn on row percents
- Turn on column percents

Chapter 5: Table Variables

What's in this chapter - This chapter explains what we call "table variables". Table variables are the basic variables that determine the layout of an output table. VitalPro allows great flexibility in designing your table. Critically, VitalPro prevents incompatibilities from occurring.

Table variables are: Main Statistic, Row Variable, Row Sorting, Column Variable, and Multi-Tables.

5-1: Main Statistic [Outcome]

• **The Main Statistic is the basic type of number in a table (or map).**

What is a Main Statistic? - Every table has a Main Statistic. The Main Statistic (or outcome) is the basic type of data generated in an output table. Each statistic is defined in the glossary, and on-line help files give calculation methods.

Reliability Indicator		Main Statistic
Number of Deaths	Confidence Interval	
--	Yes	Deaths
Yes	Yes	Death Rate
Yes	Yes	Age-Adjusted Death Rate
Yes	Yes	Mean Age of Death
Yes	Yes	Standardized Mortality Ratio
Yes	Yes	Years of Potential Life Lost
Yes	Yes	Years of Life Lost Rate

Reliability indicator - As shown in the table above, a reliability indicator (either number of deaths or confidence interval) is displayed along with most statistics. The **number of deaths** is normally displayed along with each rate and YPLL. Optionally, you may request that **confidence intervals** be displayed as the reliability indicator.

5-2: Rows and Columns, Row Sorting

· **Table rows and columns may be set however you want.**

Rows and columns - Rows are horizontal lines in a data table. Columns go up and down.

Every table has a row variable and a column variable. Rows and columns may be set to any of the following:

- Only one row / column (not set to a variable)
- One row / column per selected age group
- One row / column per selected area set
- One row / column per selected sex
- One row / column per selected ICD set
- One row / column per selected race set
- One row / column per selected year set

Sorted rows - Any table may be sorted as follows:

- Rows sorted from high to low, by total data
- Rows sorted from low to high, by total data

Unsorted rows - Examples of rows in standard order (unsorted rows) include:

- Area sets in alphabetical order, such as Orange before Yuba.
- ICD sets in alpha-numerical order, such as C34 before K74.

5-3: By Variable (Multi-Tables)

- You may automatically produce a series of tables.

Deaths
Tabulated by Race-Ethnicity and Sex
Years: 1999
Place of Residence: Alameda
ICD A00-Y99: All causes of death

Race	Male	Female	Total
Am Indian	23	8	31
Asian/PI	566	460	1,026
Black	1,052	1,000	2,052
Hispanic	388	337	725
White	2,795	3,234	6,029
Total	4,824	5,039	9,863

*** Tables omitted to save space ***

Deaths
Tabulated by Race-Ethnicity and Sex
Years: 1999
Place of Residence: Yuba
ICD A00-Y99: All causes of death

Race	Male	Female	Total
Am Indian	4	3	7
Asian/PI	12	9	21
Black	8	11	19
Hispanic	17	8	25
White	246	233	479
Total	287	264	551

Purpose of multi-tables - Suppose you want to make a separate table for each county. It would be tedious to select the first county, make a table, select the second county, make a table, etc. Multi-tables automates the production of such a series of tables into one operation. The multi-table setting may be one of the following:

- Only one table (the default)
- One table per selected age group
- One table per selected area set
- One table per selected ICD set
- One table per selected race set
- One table per selected year set

Chapter 6: Data Variables

What's in this chapter - This chapter lists and explains data variables you may modify using the California VitalPro interface. VitalPro allows great flexibility in selecting and modifying data variables. You may select variables into "ranges" (eg, 2009-2010) and "sets" (eg, "White + Black") just about any way needed.

Here are the data variables covered in this chapter:

Here are the data variables covered in this chapter:

- Age groups
- Race
- Sex
- Years

- Causes of death (ICD sets)
- Geographic selection (area sets)

6-1: Geo Selection [Area Sets]

- **Every table has a geographic specification.**

Geographical Areas - California VitalPro analyzes data to the county level. California has 58 counties, organized into 14 Health Service Areas (HSA's). Each HSA is a group of one or more counties.

You may select any combination of areas - VitalPro makes it easy to compare results between different groupings ("sets") of geographic areas (Counties and County groupings), or limit analysis to specific geographic areas. One or more geographic areas may be combined into an area set, and compared with other sets.

Selection is quick and easy - All geographic operations are grouped together on one submenu, to allow quick and easy selection of any combination of areas desired. A previous interface snapshot shows the main geographic menu.

6-2: Range and Categorical Variables

Race Groups

You may select any combination of race groups to analyze. Races may be combined into "sets" as needed. A separate submenu allows easy selection. Keep in mind that differences in health status between races may be due to socio-economic differences.

Each death is classified as American Indian, Asian / Pacific Islander, Black, Hispanic, or White, as follows: 1. All who identify themselves as Hispanic are classified as Hispanic. 2. The remainder are classified as Black, White, American Indian, or Asian / Pacific Islander. 3. White also includes Other-Specified, Refused To State, and Unknown. 4. American Indian also includes Eskimo and Aleut. 5. Asian / Pacific Islander includes Asian-Unspecified, Asian-Specified, Chinese, Japanese, Korean, Vietnamese, Cambodian, Thai, Laotian, Hmong, Indian, Filipino, Hawaiian, Guamanian, Samoan, and Pacific Islander.

Age Groups

VitalPro lets you combine and analyze age groups in just about any way needed. You may select any contiguous combination of age groups to analyze, such as 22-34. Or, you may select a set of ranges, such as birth-19, 20-39, 40-64, 65-99+.

The program will let you know which age groups are available for use. Standard age groupings, such as 5-year, 10-year, and 20-year age groups are easily selected. Once you have a standard grouping selected, you may combine them in just about any way desired.

California uses 1-year groups up to age 21, and 5-year groups thereafter, up to the 95-99+ group. Up to age 21, 1-year ages are used (for example, 3 or 11-17). For 22 and over, an age group may use any combination of 5-year groups (for example, 40-44 or 30-49). The highest group is currently 95-99+ (95 and over).

Sex

You may select Male, Female, or both sexes combined.

Years

You may select any continuous range of one or more years to analyze, such as 1980-1983. In addition, you may select a set of year ranges for comparing, such as 1990-1991, 1992-1993, 1994-1995. The program will let you know which years are available for use. Standard groupings, such as 1-year, 2-year, and 3-year groups are easily selected. Year groups may be combined in just about any way desired.

Multi-year death rates are calculated by adding all of the deaths over the time period, and dividing by the sum of the populations over that same period.

6-3: Causes of Death [ICD Sets]

• Mortality tables always include causes of death.

ICD-10 codes - VitalPro classifies causes of death with ICD codes. ICD stands for "International Classification of Diseases", the standard system for classifying causes of death. Each disease or condition has a separate 3-digit ICD-10 code (character followed by two digits) (for example, C53 for cervical cancer), or 4-digit ICD code (for example, G71.0 for muscular dystrophy). As of 1999, mortality data use ICD-10.

ICD-9 codes - Data from 1980 to 1998 use the 9th revision of the ICD system (ICD-9). ICD-9 works basically the same as ICD-10, but the codes look somewhat different, and there are many changes in the categories, so ICD-9 and ICD-10 results cannot always be directly compared. Each disease or condition has a separate 3-digit or 4-digit ICD-9 code. For example, 250 for diabetes mellitus, 005.1 for botulism.

ICD groups and sets - An ICD group is one or more consecutive ICD codes (for example, C00-D48 for neoplasms). An ICD set is one or more ICD groups combined. For example, ICD C50 for breast cancer and ICD C53 for cervical cancer may be combined into an ICD set (C50 plus C53). At the broadest level, the ICD-10 system has 19 major disease categories. At the most detailed level, there are about 7,600 four-digit ICD-10 codes. At the broadest level, the ICD-9 system has 17 major disease categories. At the most detailed level, there are about 5,000 four-digit ICD-9 codes. For ICD-9 codes 800-999 (injury and poisoning), VitalPro uses external cause codes (E-codes), standard for mortality analysis.

Selecting ICD groups - VitalPro allows you to select and combine ICD groups to meet your analysis needs. You may select ICD sets by entering the range (for example, enter C16 for stomach cancer, or B20-B24 for HIV/AIDS). Or, you may select from ICD selection menus, organized to allow you to narrow your focus without having to know the specific code. Or, you may select one of several standard ICD lists. For example, for easily calculating leading causes of death, select the NCHS list of 50 rankable causes.

California VitalPro automatically formats leading cause reports, to save you the trouble of converting ICD codes such as "ICD E10-E14" and set numbers such as "Set #18" to descriptive terms such as "Diabetes" and "Heart Disease".

Chapter 7: Charts and Maps

What's in this chapter - This chapter explains about settings for VitalPro charts and maps.

Charts are very helpful for scanning the data for trends, and for better communicating findings to others. Plus, they make the data more attractive, less boring. VitalPro makes three kinds of graphic charts. Each chart type is more or less best suited for a particular purpose:

Bar Charts

- Compare amounts of different things.
- For example, which race group has a higher birth rate?
- Or, which sex has more deaths from a particular cause?

Line Charts

- Show movement, trends, comparisons.
- For example, which age group has a higher death rate?
- Or, is a particular rate changing (up or down) over time?

Pie Charts

- Show parts of a whole, a quick overall comparison.
- For example, what proportion of deaths occur in males?
- Or, what proportion of births are to teenage moms?

Maps are a special kind of graphical data display, to show geographic differences in rates and counts. VitalPro makes attractive maps, in PNG and PDF formats.

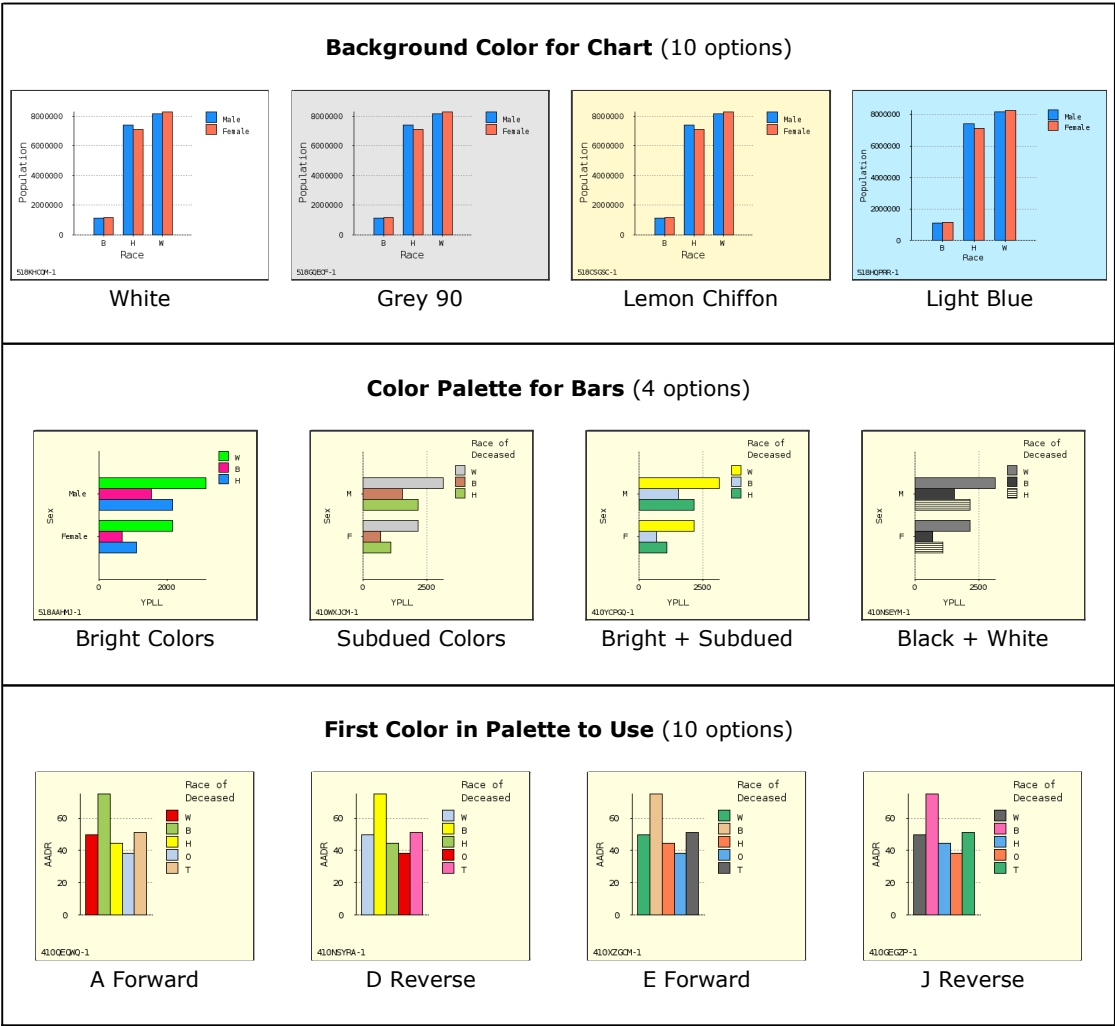
VitalPro charts and maps can be extensively customized, as explained in this chapter.

7-1: Bar Chart Color Settings

There are three settings for customizing Vitalnet bar chart colors:

- The background color behind the chart.
- The color palette to use for the bars.
- The first color in the palette to use for the bars.

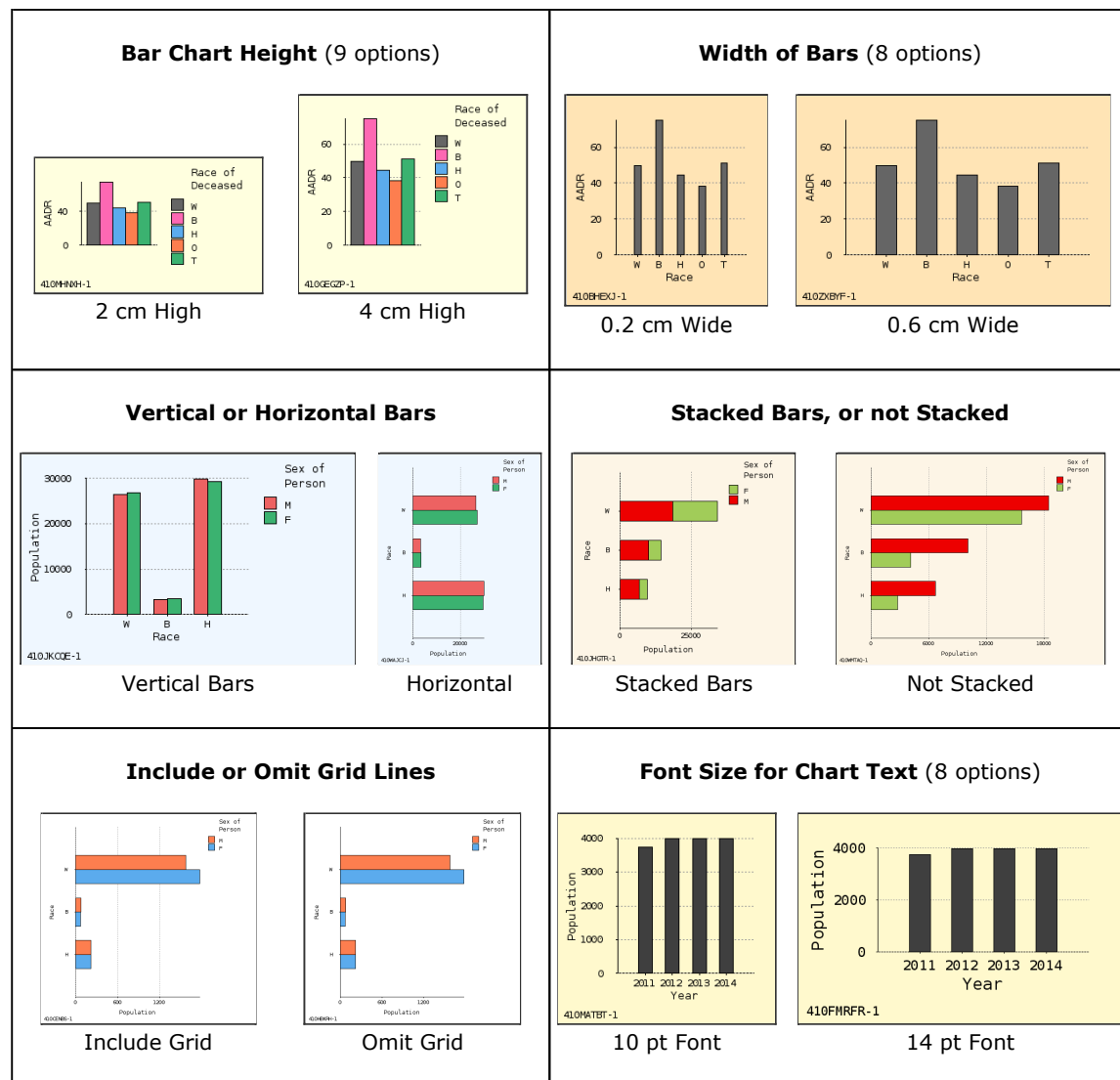
Below are shown the three settings, with examples for each:



7-2: Bar Chart Layout Settings

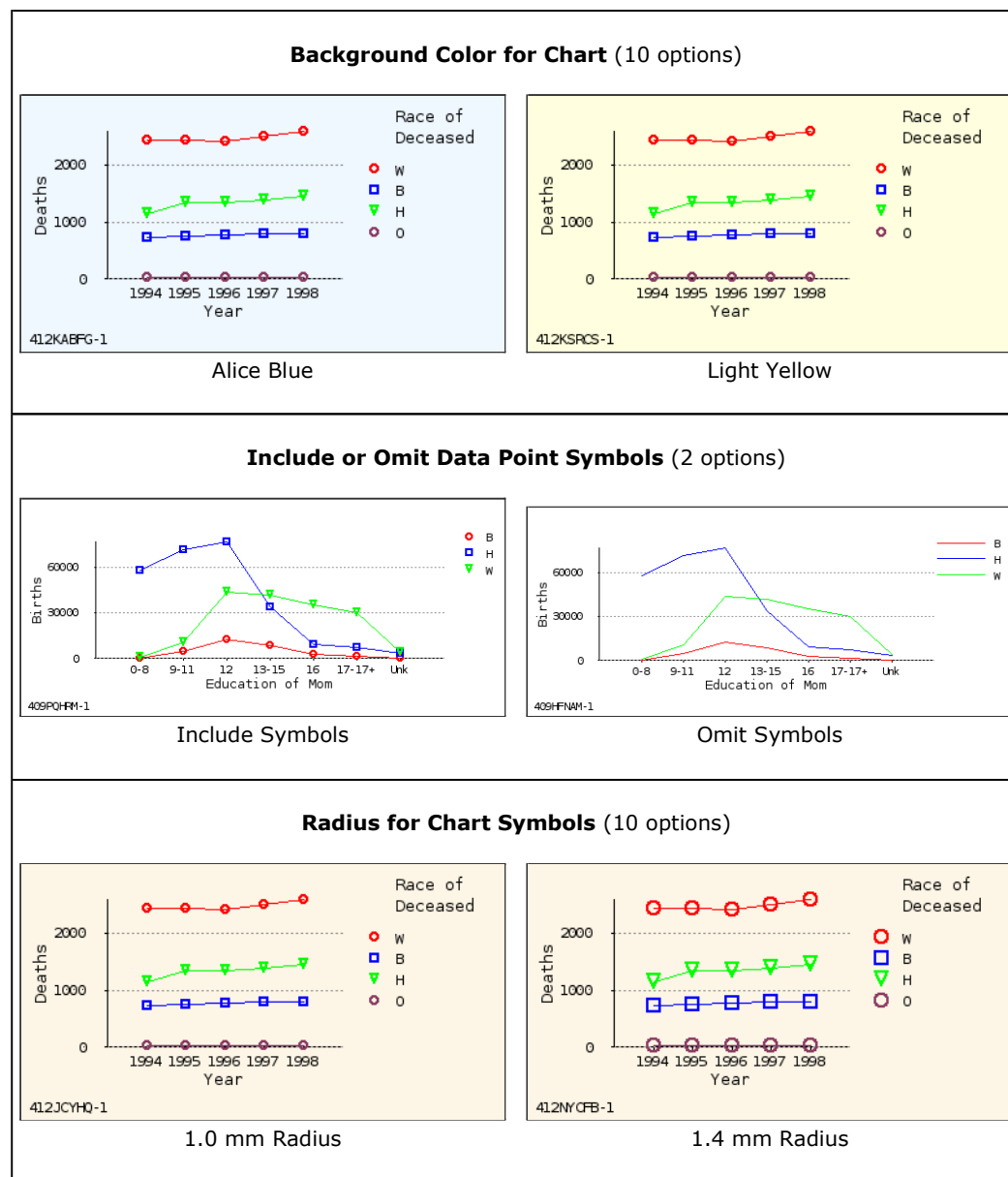
There are six ways to customize the layout of Vitalnet bar charts:

- Bar height, and bar width.
- Orientation (horizontal or vertical).
- Stacking (works with either horizontal or vertical bars).
- Grid lines may be added, or font size changed.



7-3: Line Chart Settings

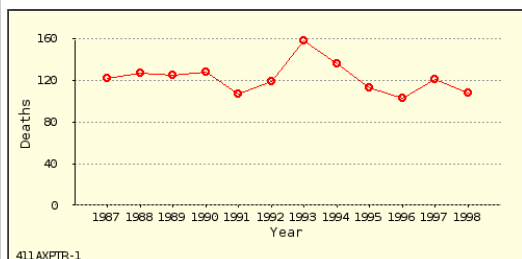
There are eight ways to customize Vitalnet line charts, as shown on this and the next page.



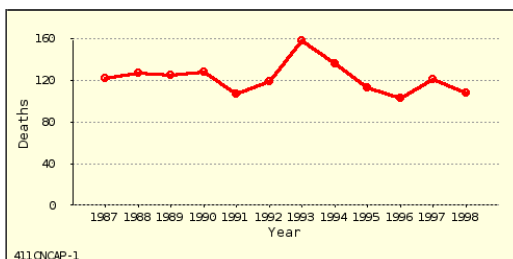
Line Chart Height - Vitalnet also allows you to set the chart height, eg 3.0 cm (9 height options).

7-4: More Line Chart Settings

Width of Lines (3 options)

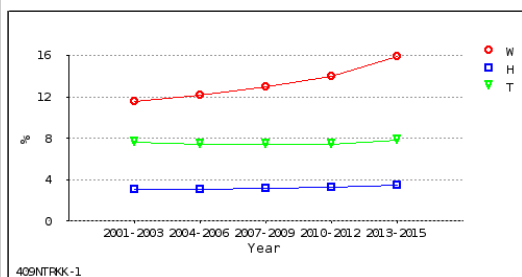


Thin Lines

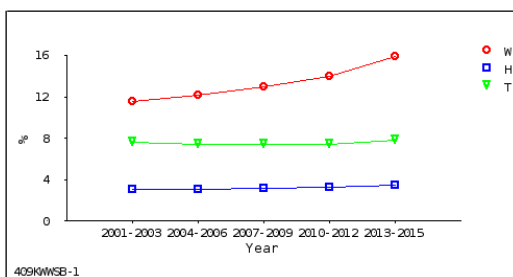


Thick Lines

Include or Omit Grid Lines (2 options)

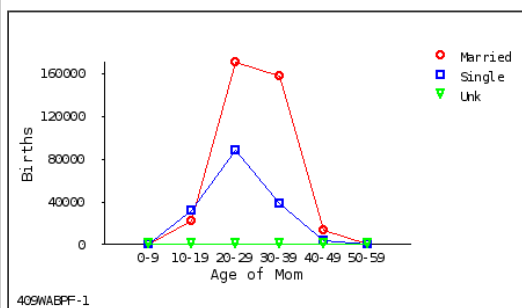


Include Grid

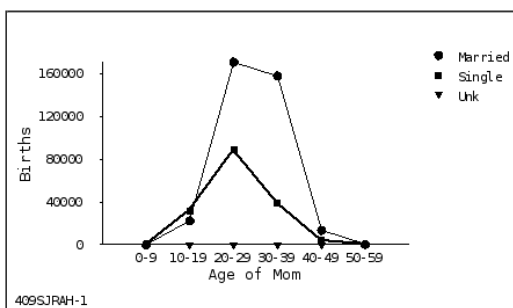


Omit Grid

Colored Lines, or Black + White (2 options)



Colored Lines



Black + White Lines

Font Size - Vitalnet also allows you to select font size, eg 9 pt (8 font size options).

7-5: Pie Chart Color Settings

There are three settings for customizing Vitalnet pie chart coloring:

- The background color behind the chart.
- The color palette to use for the pie chart.
- The first color in the palette to use (for slice #1).

Background Color for Chart (10 options)

SL7GJME-1

SL7PKJAG-1

SL7BCQR-1

Cornsilk Background

Grey Background

Light Cyan

Color Palette for Pie Chart (3 options)

SL6PSBQB-1

SL6SYQB-1

SL6YCARN-1

Bright Colors

Subdued Colors

Mixed Colors

Slice #1 Color to Use (10 options)

SL6BAJME-1

SL6JARX-1

SL6JKJZ-1

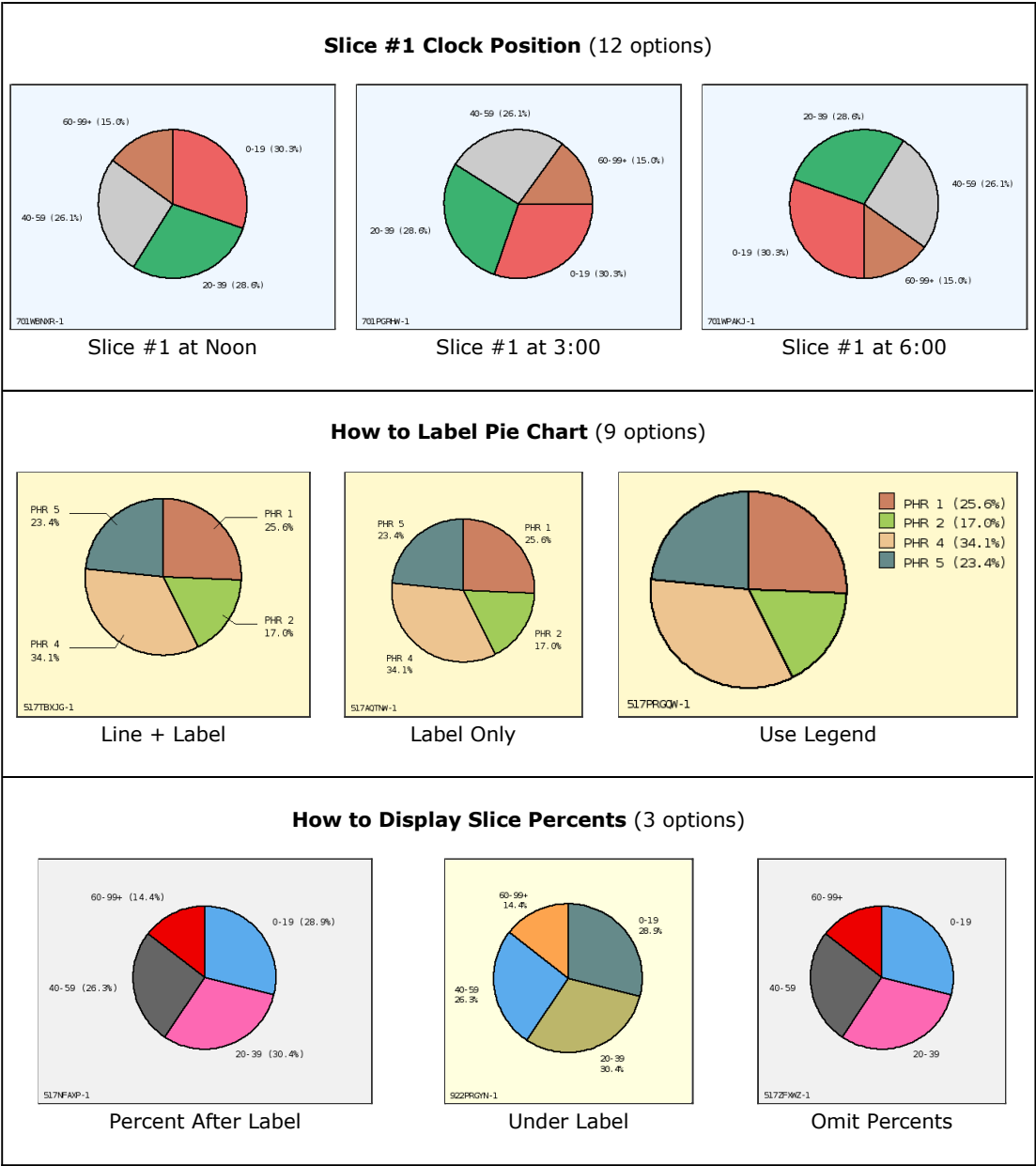
Color A for #1

Color B for #1

Color C for #1

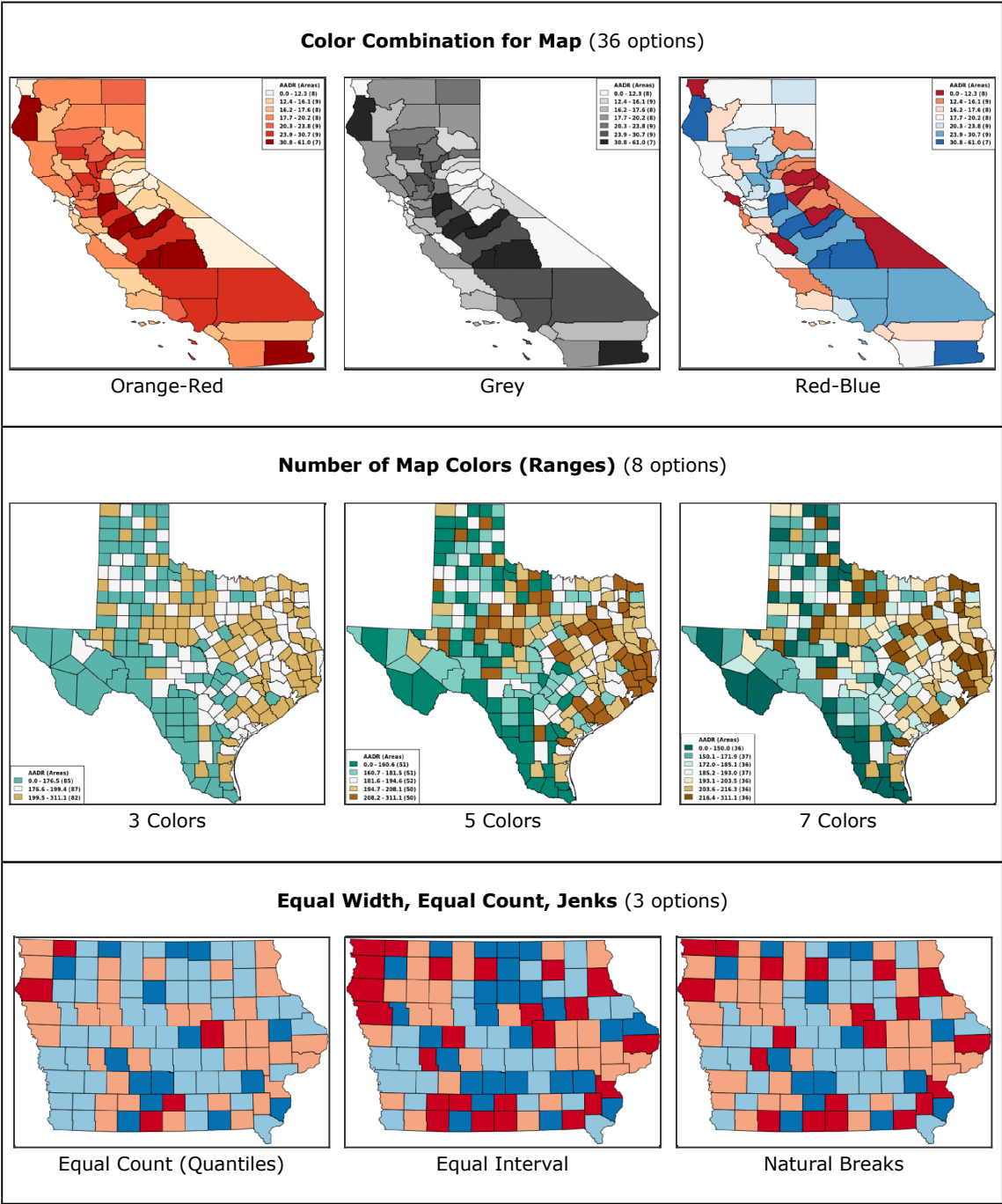
7-6: More Pie Chart Settings

There are four settings for customizing Vitalnet pie chart layout, as shown below:

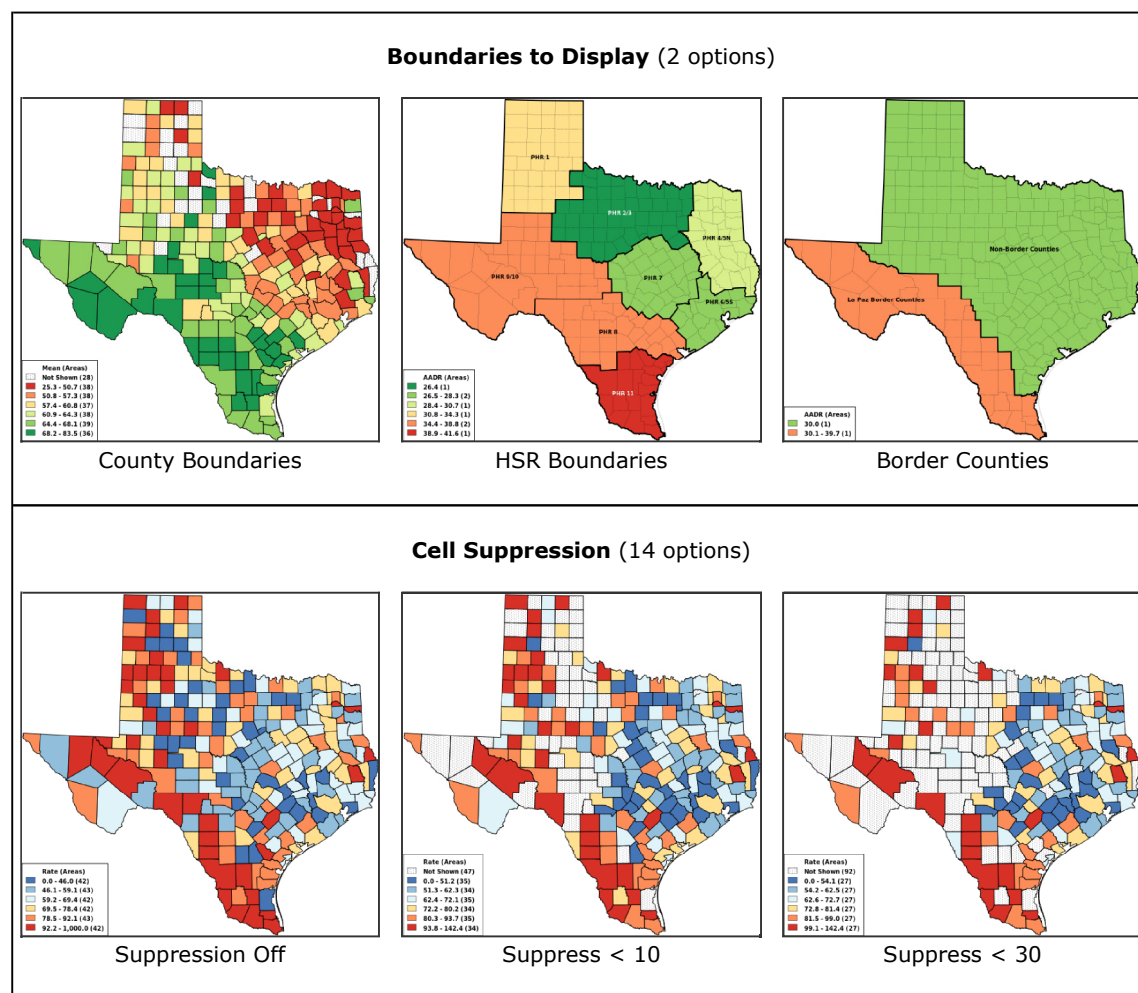


Pie Chart Radius - Vitalnet also allows you to select the pie chart size, eg 2.0 cm (9 options).

7-7: Map Color Settings



7-8: More Map Settings



PNG and PDF formats - Vitalnet always makes both PNG and PDF map output. Access the PDF version by clicking a link at the bottom of the web page with the PNG map. The PDF version is set to 8 1/2 x 11 inches.

Text Font for Map - There are 9 font options for displaying area labels:

[Serif Normal] [Sans-Serif Normal] [Monospace Normal]
 [Serif Bold] [**Sans-Serif Bold**] [**Monospace Bold**]
 [*Serif Italic*] [*Sans-Serif Italic*] [*Monospace Italic*]

Time Trend Maps - Finally, Vitalnet can make (not shown here) a series of maps, one map for each selected year range. The map series is cycled within a special interface. The data ranges are the same for each map in the series, so you can directly compare the maps.

7-9: Map Color Palettes

Vitalnet uses a series of standard color palettes for designing and producing maps. These palettes have been proven effective through published research, and have been used in standard disease atlases. Trying to produce color palettes by hand is frustrating and tedious, and usually results in bad-looking color combinations. Besides saving lots of time, using the standard color palettes built into Vitalnet insures your results are effective and attractive. There are enough palettes (a total of 36) to give you many choices for your personal color preferences.

1	2	3	4	5	6	7	8	9	Diverging Palette	BW	CB
									Brown-BlueGreen	-	Y
									Pink-Green	-	Y
									Purple-Green	-	Y
									Purple-Orange	Y	Y
									Red-Blue	-	Y
									Red-Grey	-	-
									Red-Yellow-Blue	-	Y
									Red-Yellow-Green	-	-
									Spectral	Y	-
1	2	3	4	5	6	7	8	9	Sequential Palette	BW	CB
									Blue	Y	Y
									Blue-Green	Y	Y
									Blue-Purple	Y	Y
									Green-Blue	Y	Y
									Green	Y	Y
									Grey	Y	Y
									Orange	Y	Y
									Orange-Red	Y	Y
									Purple-Blue	Y	Y
									Purple-Blue-Green	Y	Y
									Purple-Red	Y	Y
									Purple	Y	Y
									Red-Purple	Y	Y
									Red	Y	Y
									Yellow-Green	Y	Y
									Yellow-Green-Blue	Y	Y
									Yellow-Orange-Brown	Y	Y
									Yellow-Orange-Red	Y	Y

BW - OK for black and white photocopying?

CB - OK for people with red-green color blindness?

All palettes are suitable for desktop color printing.

References and research used to help design Vitalnet palettes: *** LW Pickle, M Mungiole, GK Jones, AA White, "**Atlas of United States Mortality**", National Center for Health Statistics, 1997. *** CA Brewer, "**Color Use Guidelines for Mapping and Visualization**", in "Visualization in Modern Cartography", Elsevier, 1994. *** [ColorBrewer](http://colorbrewer.org) web site displays tested color palettes.

7-10: When Charts and Maps are Made

Whenever you make a table, VitalPro also automatically makes one or more accompanying charts. But it only produces the charts that make sense. If the chart would look awful, or not be epidemiologically valid, VitalPro does not make it.

VitalPro is always ready to produce a map or table. It's only the charts that are sometimes not made, as explained below:

Bar charts are only made if the following conditions are met:

- 1 to 20 rows (groups of bars).
- 1 to 10 columns (bars per group).
- No suppressed results (for stacked bar chart).

Line charts are only made if the following conditions are met:

- Range rows (such as age or year).
- Ranges are continuous (not 2000, 2002).
- Rows not sorted. No suppressed results.
- No more than 10 lines (10 columns).

Pie charts are only made if the following conditions are met:

- Cumulative data (counts, some rates).
- One set of numbers (one row or column).
- 2 to 9 pie slices. No suppressed results.

Single map output may be produced at any time that you have switched to designing a map. Otherwise, tables (along with any accompanying charts) are made.

Time trend maps are special. They are only produced when all selected year ranges are the same width. For example, 1995-1996, 1997-1998, 1999-2000 is OK. But 1995-1996, 1997-1998, 1999 is not OK. Also, obviously at least 2 year ranges are required. So if you just have 1995-1996 (a single range) selected, Vitalnet does not make a time trend map.

Chapter 8: Other Parameters

What's in this chapter - This chapter explains various other key parameters, that are neither table variables nor data variables.

Here are the other parameters covered in this chapter:

- Cell Confidence Level
- Cell Suppression
- Decimal Place Digits
- Trend Confidence Level

8-1: Confidence Intervals

Statistical reliability - In general, results that are based on a smaller number of events are less reliable than those based on a larger number. Confidence intervals allow you to formally estimate the statistical reliability of your results.

Confidence interval definition - A confidence interval (also known as confidence limits) is the range of values within which the true value of a variable is thought to occur, with a specified confidence level (95%, 90%, 80%, etc.). A higher confidence level (for example, 99%) implies greater confidence that the true value is included, so results in a larger interval than a lower confidence level (for example, 80%). Use the 95% confidence level unless you have a reason to do otherwise.

Methods for confidence intervals - VitalPro uses the Poisson distribution to calculate most confidence intervals, using the method described in "Scientific Tables", Diem and Lentner (ed), Geigy, 1970 (equations 802a and 802b on page 189). Confidence intervals for standardized mortality ratios are calculated using the method of Rothman and Boice described in "Research Methods in Occupational Epidemiology", Checkoway, Pearce, and Crawford-Brown, Oxford University Press, 1989, (equations 5.7 and 5.8 on page 127). Confidence intervals for trend analysis are calculated using Student's t-distribution.

8-2: Decimal Places

VitalPro allows specification of the number of decimal places in your results. For example, the number 64.29 has two decimal places. The number 64 has zero decimal places.

8-3: Cell Suppression

- You may suppress cells with low numbers of deaths.

How cell suppression works - Cells with low numbers of deaths may be blanked out with an asterisk (*). You set the level at which results will be suppressed. Line charts and pie charts are not included if any cells are suppressed, because the charts are too disrupted by the cell suppression.

Suppression of row / column totals - It's a little complicated. A row total will be **suppressed** if there is exactly one suppressed cell in the row, or if the row total is low enough to be suppressed. A row total will be **displayed** if there is more than one suppressed cell in the row, unless the row total is low enough to be suppressed. The same rules apply to columns.

Use of cell suppression - Cell suppression may be used for certain data tables to be released to the public, where there is a concern that low numbers should not be published, due to potential confidentiality issues. Concerns about reliability of small numbers are probably better addressed by using confidence intervals, or by including the number of deaths as a reliability indicator.

Cell suppression in dBASE III files - A suppressed result is indicated as "-1".

```
Deaths
Tabulated by Age and Sex
Years: 1999
Place of Residence: San Francisco
ICD B20-B24: Human immunodeficiency virus [HIV] disease
```

Age	Male	Female	Total
Birth-9	*	*	*
10-19	*	*	*
20-29	6	*	*
30-39	47	4	51
40-49	71	11	82
50-59	43	6	49
60-69	6	*	*
70-99+	*	*	*
Total	175	22	197

```
Analysis Footnotes:
Unique ID, for Keeping Track of Analyses: 507YSPPZ
Output Produced: Mon May 07 17:32:14 2001, by California VitalNet
Deaths Classified by: ICD-10, Underlying Cause, County of Residence
Suppress Cell [*]: If 3 or Fewer Deaths In Cell
Suppress Row/Column Total [*]: If Exactly One Suppressed Cell in Row/Column
Mortality Data Source: DHS Office of Health Information and Research
```

Table with Suppressed Cells

8-4: Trend Analysis

• **VitalPro automatically carries out trend analyses.**

Purpose of trend analysis - When analyzing data with a year (or year range) for each row, you usually want to know: Is there a trend up or down? Is the rate increasing or decreasing?

When Trend analysis is done - Trends are calculated if (1) the "row variable" is year, (2) rows are not sorted, and (3) year groupings have equal ranges, for example 2000-2001, 2002-2003, 2004-2005.

Least-squares line shows the trend - VitalPro carries out a "least-squares" analysis for the time series. This finds the best straight line to describe the data for each data column. The line is defined by the value for the first year ("y-intercept"), and the amount of change per year range ("slope").

Confidence intervals show if significant trend - VitalPro calculates a confidence interval for the slope. If the confidence interval doesn't include 0, there is a significant trend.

Death Rate (per 100,000)
Tabulated by Year and Sex
Age: Birth-11m Years
Place of Residence: Texas
ICD 001-999: All Causes Of Death

Horizontal Bar Graphs (X = 64.6 Deaths / 100,000, x = 32.3):

Year	Male Rate	Female Rate	Total Rate
1990	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXx	XXXXXXXXXXXXXXXXx
1991	XXXXXXXXXXXXXXXXx	XXXXXXXXXXXXXx	XXXXXXXXXXXXXXXX
1992	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXX	XXXXXXXXXXXXXXXX
1993	XXXXXXXXXXXXXXXXx	XXXXXXXXXXXXXx	XXXXXXXXXXXXXXXXx
1994	XXXXXXXXXXXXXXXXx	XXXXXXXXXXXXx	XXXXXXXXXXXXX
1995	XXXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX
Total	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXx	XXXXXXXXXXXXXx

Detailed Least-Squares Analysis, to Detect Linear Trend:

Column	1990 Y-intercept	Slope	95% CI (4 df, t=2.7764)
Male	941.1	-41.76	-59.37 to -24.16 **
Female	742.9	-29.64	-44.32 to -14.96 **
Total	844.1	-35.81	-50.58 to -21.05 **

Y-intercept and slope may be used to draw least-squares line.
If confidence interval (CI) does not include 0, trend is significant [**].

Significant Downward Trends for some Death Rates

8-5: CSV and DBF Output

• **Results may be saved to a spreadsheet, DBF, or text file.**

Saving to a second format - The output in your desktop browser always includes (at the bottom of the output) links to spreadsheet (csv, tsv, or dif), text (txt), and dBASE III (dbf) output. To view or download one of the second formats, simply click on one of the links.

CSV file (comma-separated-value) (for spreadsheets) - CSV output has a comma between each output item, and each text item is surrounded by "double quotes", as shown below. CSV format is ideal for importing into spreadsheet software. TSV (tab-separated-value) format is similar, but uses tabs instead of commas between items.

Browser differences - Internet Explorer automatically displays CSV output in Excel (if installed). Other browsers may be configured to automatically display CSV output in a spreadsheet program. Or you may need to right-click on the link, and select "Open" to open the file.

```
"Deaths"
"Tabulated by Race-Ethnicity and Sex"
"Age: 20-39 Years"
"Years: 1999"
"Place of Residence: Hlth Serv Area 1"
"Causes of Death (ICD-10): A00-Y99: All causes of death"

"Race", "Male", "Female", "Total"
"-----"
"Am Indian",10,4,14
"Asian/PI",3,2,5
"Black",5,1,6
"Hispanic",16,3,19
"White",159,90,249
"-----"
"Total",193,100,293

"Analysis Footnotes:"
"Unique ID, for Keeping Track of Analyses: 507YWEGB"
"Output Produced: Mon May 07 17:24:49 2001, by California VitalNet"
"Deaths Classified by: ICD-10, Underlying Cause, County of Residence"
"Mortality Data Source: DHS Office of Health Information and Research"
```

Example of CSV Output

DBF file (useful for many other applications) - Results may also be saved to a dBASE III database file (dbf extension). DBF files are excellent for importing into almost any data analysis, graphics, spreadsheet, mapping or other presentation software. Field names are automatically imported along with the data. Suppressed cells are represented by the number "-1".

DBF file limitations - (1) Header and footer information listing analysis parameters is not included in database files. To help out, you may want to make the name of the dBASE file the same as the table ID, such as "405MFAQB.DBF" so you can refer to the table later. (2) Only 128 columns may be saved to a dBASE III file. This rarely presents a problem, because unlimited rows are allowed.

Glossary

Age-adjusted death rate - Deaths per 100,000 population, adjusted to a standard population (such as US 1940 or US 2000), by the direct method. Age-adjusted rates are often better for making comparisons than unadjusted rates, because they adjust for differences in age distribution between populations. An age-adjusted rate is a summary synthetic measure. Besides calculating overall age-adjusted rates, it is also recommended to compare age-specific rates.

Age-adjustment standard - A standard population for calculating an age-adjusted death rate. The 1940 and 2000 US Census population are the most common standards.

Area set - One or more areas combined.

ASCII file - A text file, with only alphabetical, numerical, and punctuation characters, like you would see in normal text. Vitalnet can produce output in ASCII format.

Cause of death - Any condition which leads to or contributes to death, and is classifiable according to the International Classification of Diseases (ICD) system.

CDC - Centers for Disease Control and Prevention. US federal health agency.

Cell - A space for a single numerical result in a table, at a row-column intersection.

Cell suppression - An asterisk "*" is placed in cells with fewer deaths than a limit set by the user. Row / column totals with exactly one suppressed cell in the row / column are also suppressed. If more than one cell in the row / column is suppressed, the row / column total is displayed.

Columns - Vertical groupings of data in a Vitalnet table, such as a column for each race group.

Confidence interval (confidence limits) - A range of values within which the true value of a variable is thought to lie, with a specified level of confidence. For a result of 23.5, a confidence interval might be (23.1-23.9). The smaller the interval, the more reliable the result. If the 95% confidence intervals do not overlap, there is probably a statistically significant difference. Vitalnet uses several methods to calculate confidence intervals. The output table documents which method was used.

Confidence level - The likelihood that the true value of a variable is within a confidence interval. For example, for confidence intervals at the 95% level, we are statistically 95% certain that the actual value of the variable is within the interval.

CSV format - Comma-separated-value format. CSV files are readily imported into spreadsheet software. Each output item is separated by a comma from surrounding items, and each output text item is surrounded by "double quotes". A comma-separated-value file has "csv" extension. Similar to TSV format.

Data mining - Finding unexpected relationships in a data set, for further study. Similar to exploratory data analysis. Vitalnet is excellent at data mining. Of course, keep in mind that the more you look, the more unusual events you will find, just by chance.

Data warehouse - Software system, such as Vitalnet, making large complex databases readily available for querying and analysis.

dBASE III format - A widely used file format originally for the database software of the same name. Files in dBASE III format may be readily imported into almost any data analysis, graphing, mapping, or other presentation software. Uses dbf extension. Suppressed cells are represented as the number "-1".

Death rate - Deaths per 100,000 population. May be used to compare the burden of disease between different groups. Also called crude death rate.

DIF format - Data interchange format. DIF files are readily imported into spreadsheet software. The DIF format is too complex to explain in this glossary. Has "dif" extension.

Denominator - The number on the bottom of a fraction. Population data are often referred to as "denominator data", as they are used as denominators to calculate population-based rates.

Export - Produce output that can be read into other computer programs. Vitalnet produces ASCII text (txt), comma-separated-value (csv), HTML (htm), and dBASE III (dbf) files for export.

Filter variable - A variable solely used to filter which records are included in the output. For example, for a single table

with race rows and sex columns, age is a filter variable.

Footer - Last part of a Vitalnet table. Lists less important details of the analysis, such as the date produced, and data sources. Also contains a unique ID to assist in keeping track of analyses.

Header - First part of a Vitalnet table. Lists key analysis parameters, such as years analyzed.

ICD - International Classification of Diseases. A widely used system of classifying diseases and injuries. Each disease or set of diseases has an ICD code or ICD group assigned to it. Vitalnet uses the ICD-9 system, for 1979-1998 mortality data, and the ICD-10 system, for 1999-present mortality data.

ICD-10 code - A single ICD number representing a single disease or injury. For example, ICD E10 for insulin-dependent diabetes.

ICD-10 group - A range of continuous ICD-10 codes. For example, ICD E10-E14 for diabetes mellitus.

ICD-10 set - One or more ICD-10 groups or codes combined, for example ICD C50 (breast cancer) and ICD C53 (cervical cancer).

Import - Read information into a computer program. ASCII text, CSV, TSV, DIF, HTML, and dBASE III files from Vitalnet are easily imported into word processing, spreadsheet, data analysis, mapping, graphing, and other presentation software programs.

Leading causes for ICD-10 - The ten causes of death with the highest number of deaths, out of a standard National Center for Health Statistics list of 50 rankable causes. Vitalnet makes it easy to select and rank the 50 cause list.

Least-squares - A standard method for fitting the best straight line to a set of points. Produces a Y-intercept and a slope defining the least-squares line.

Mean age of death - If the ages were 50, 51, and 58, the mean age of death is $(50 + 51 + 58) / 3 = 53$

Multiple age groups - One age group for each table row (or column). Example: 0-19, 20-59, 60-99+.

Multiple cause mortality data - Data which include all causes of death listed on the death certificate. Contrast with underlying cause mortality data.

Multiple causes of death - All diseases or injuries which led directly to death, or all circumstances of the accident or violence which produced the fatal injury.

Natural Breaks - Method for determining map ranges. Minimizes "squared deviations from class means".

NCHS - National Center for Health Statistics. US health statistics agency. Part of the CDC.

Place of occurrence mortality data - Data compiled by the location the death occurred, without regard to the place of residence of the deceased. Vitalnet does not currently analyze for place of occurrence.

Place of residence mortality data - Data compiled by the place of residence of the deceased, without regard to the location where the death occurred. Vitalnet analyzes mortality data by place of residence.

Population - The number of people living in an area.

Rows - Horizontal lines in a Vitalnet table, such as a row for each race group.

Row sort settings - Vitalnet rows may be sorted in ascending or descending order.

Set - A combination of one or more things. For example, several areas may be combined into an area set.

Single age group - Only one age group (30-49, for example) is selected. A single age group is used for tables that do not have age columns or age rows.

Standardized mortality ratio (SMR) - The ratio of the expected number of deaths to the observed number of deaths. The expected number of deaths is derived by applying a standard set of rates (usually state or national rates) to a population. SMRs help assess whether the mortality in a population is higher than expected.

Statistic (Main Statistic) - The basic type of numerical result displayed in a table, chart, or map. For example, birth rate, death rate, population, pregnancy rate, etc.

Table - A set of results produced by Vitalnet. A table has several parts:

1. Header - lists basic analysis settings
2. Data section - numerical results
3. Horizontal bar graphs - graphical representation of the data
4. Footer - lists other analysis settings

Tabular chart - A section of a Vitalnet table. Gives an scaleable graphical representation of the data. May be omitted from the output table.

TSV format - Tab-separated-value format. TSV files are readily imported into spreadsheet software. Each output item is separated by a tab from surrounding items, and each output text item is surrounded by "double quotes". A tab-separated-value file has "tsv" extension. Similar to CSV format.

Underlying cause - The disease or injury that initiated the train of events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury. A single underlying cause is assigned to each death.

Underlying cause mortality data - Data which include only the underlying cause of death listed on the death certificate. Contrast with multiple cause mortality data.

Unix - A popular set of computer operating systems. Vitalnet can run on Unix.

Unknown Values - Unknowns are automatically inserted into a Vitalnet table. For example, a separate row (or column) for unknown race. The rate is assigned as zero for an unknown category, since there is no population denominator to use. Some fields, such as sex for certain data sets, are never unknown, so unknowns are left off the table. When, such as for age-adjusted rates, the unknown variable (age) is different from the rows or columns, the number of unknowns for age is shown below the table.

Windows - Microsoft PC operating systems. Vitalnet runs under any version of Windows.

World Wide Web (WWW) - A widely used part of the internet that may be easily accessed with a web browser. Vitalnet runs on the WWW.

Years of potential life lost (YPLL) - Sum of the years of life lost by persons who die "early". Early death is usually defined as death occurring before the age of 65 (the YPLL age limit). For example, death at age 40 (40.5) results in 24.5 YPLL to age 65. YPLL is a widely used measure of premature mortality.

YPLL age limit - The age used for calculating YPLL. The most common YPLL age limit is 65.

YPLL rate - YPLL per 100,000 population in the appropriate age category. The YPLL rate up to age 65 is calculated as follows: (YPLL up to age 65) / (population for age group 0-64). Not commonly used.

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