



September 2012

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**Technical Brief**

**Table Design**

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## 2. Introduction

Tables are used regularly to communicate lists of quantitative information, and they have become commonplace since the advent of spread sheet software in the 1970s. When they are used properly and well-designed, they are fantastic. But unfortunately, this is not always the case and they often fall far short of their potential. The best indicator showing that we have designed good tables is when we can easily read across rows and down columns, when it is easy to understand and easy to refer to in the text of your report, and when it includes only the relevant data from your results.

This technical brief has as objective to show readers best practices in how to design effective tables and thus to improve their visual communication through their use.

## 3. Relationships

Numbers are the content, and thus the substance of tables and graphs. When you design the display of quantitative information, whether you use a table or a graph, the specific type of table or graph you use depends primarily on your message. Quantitative messages are always about relationships and different types of relationship require different types of display.

### 3.1 Quantitative relationship

Below are some examples of relationships which define the essential nature of quantitative messages.

Quantitative information	Relationship
Units of a product distributed per geographical region	Distribution count related to geography
Monthly income by family	Income related to time
Coverage of IDPs camps in terms of NFI	Number of NFIs kit related to number of families in camps
Availability of safe water in a given geographical area	Number of litres available per day and per person related to the geographical area

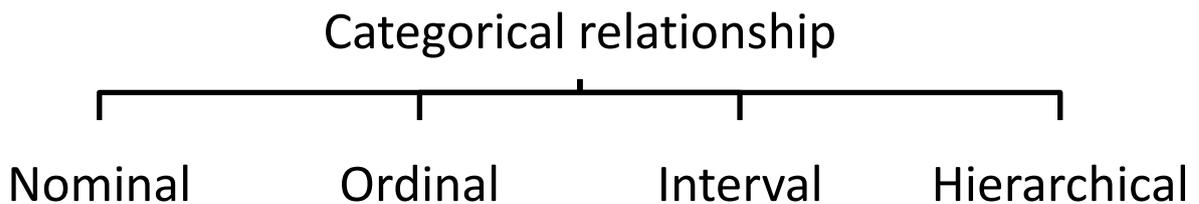
In the above table, the relationship is between quantitative values and categorical subdivisions. *Quantitative* and *categorical* are the two types of data that define quantitative information. Quantitative values measure things, categories subdivide the things that they measure into groups: geographical areas like north (area), affected groups (IDPs) or into months (time). This distinction is important when designing tables or graphs since both types of data play different roles and are often structured and displayed in different ways.

Sometimes, the relationship is not only between quantitative values and categorical subdivisions but it can only be of quantitative values like shown in the below table:

Quantitative information	Relationship
The coverage of a cholera treatment program	The number of cholera cases treated related to the total number of cholera cases identified
Registration exercise efficiency	Number of refugees officially registered related to the estimation of total refugees.

### 3.2 Relationship within categories

So far we have mentioned two types of quantitative relationships but it is also important to mention that there are different relationships within categorical subdivisions and quantitative values. Categorical subdivisions can relate to one another in the following way: **nominal**, **ordinal**, **interval** and **hierarchical**.



A *nominal* relationship is one in which the individual subdivisions of a single category are discrete and have no intrinsic order. As the name itself suggests, they “only name things” such as East, West, North, South or like IDPs, returnees, refugees, etc.

Affected group	Number
IDPs in camps	18,000
IDPs in public building	24,500
IDPs in host families	56,000
<b>Total</b>	<b>213,000</b>

An *ordinal* relationship between categorical subdivisions is one in which the individual subdivisions have a prescribed order. Typical examples are “first, second, third, etc”, “small, medium and large”.

Priorities (source population)	Items
1st	Food
2nd	Clean water
3rd	Security

An *interval* relationship is one in which the categorical subdivisions consist of a series of individual, sequential numerical ranges that subdivide a full set of quantitative values into smaller ranges. These individual numerical ranges, called intervals, can be arranged in order from smallest to largest (ascending order) or largest to smallest (descending order). The table enclosed is an example of an interval relationship per sex and age intervals. Notice that the intervals are equal in size.

Age	Male	Female
0-4	192,660	186,772
5-9	170,653	160,397
10-14	123,073	130,371
15-19	147,680	146,087

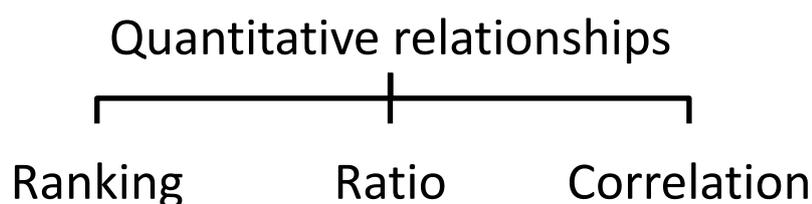
A *hierarchical* relationship involves multiple categories that are closely related to each other as separate levels in a ranked arrangement. Starting from the top of the hierarchy and progressing down, each subdivision at each level is associated with only one subdivision at the level above it. Each subdivision at every level, except the bottom level, can have one or more subdivisions associated with it in the next level down. For instance, in Table 1, Diffa region is composed of 3 departments, Diffa, Mainé-soroa and Nguigmi.

Table 1 Food Security Status In 2 Regions Of Niger, 2012

Region	Department	Food security status			
		Severe	Moderate	At risk	Food secure
Diffa	Diffa	10,775	64,168	44,390	97,752
	Mainé-soroa	18,067	60,110	59,983	66,800
	Nguigmi	2,129	32,237	23,254	70,424
Dosso	Dosso	5,806	126,931	128,500	145,268
	Boboye	16,327	60,631	73,904	222,935
	Doutchi	28,458	143,536	201,386	309,385
	Gaya	3,455	60,969	81,374	204,660
	Loga	19,194	69,149	48,891	63,897

### 3.3 Relationships between quantities

Categorical subdivisions can also relate to one another by virtue of the quantitative values associated with them. Quantitative values can be used to display **ranking**, **ratio** or **correlation** relationships.



*Ranking* is when the order in which the categorical subdivisions are displayed is based on the associated quantitative values, either in ascending or descending order, as shown in table 2 enclosed.

*Ratio* is a relationship in which two quantitative values are compared by dividing one by the other, as represented in table 3 below. This produces a number that expresses their relative quantities. A common example is the relationship of the quantitative value for a single categorical subdivision compared to the sum of the entire set of subdivisions in the category. E.g. the price of one food product compared to the price of all the other food products for one family for one week, the number of families who have been distributed Shelter package compared to the total number of families affected.

**Table 2 Ranking of Affected Group numbers, country X, 2010**

Affected group	Number
Affected residents	56,000
IDPs in public building	24,500
IDPs in camps	16,000
Host populations	4,000
<b>Total</b>	<b>100,500</b>

**Table 3 Ratio Of Families Assisted With Shelter Package, Country X, 2011**

Province name	No. of affected families	No. of distributed kit*	Ratio
Romeo	1,321	962	0.73
Alpha	859	622	0.72
Delta	1,519	1023	0.67
Papa	3,535	2,358	0.67
<b>Total</b>	<b>7'234</b>	<b>4'965</b>	

\* One kit per family

A *Correlation* is a relationship in which the values of two paired sets of quantities are compared to determine whether increases in one set correspond to either increases or decreases in the other set. A practical example of correlation can be the correlation between the incidence of diarrhoea and the use of non-protected water sources or the water quality. The correlation here establishes whether the number of diarrhoea cases increase, remain stable or decrease depending on the use of unsafe water points.

## 4. What is a table?

A table is a structure for organising and displaying information. It shows data arranged in columns and rows, and data encoded as text (including words and numbers). The column and row structure of tables are often visually reinforced by grid lines (horizontal and vertical), but the aspect that characterizes tables is the arrangement of the information, and not the presence of lines that visibly delineate the structure of the underlying grid. Tables are not only used to display quantitative information but can also be used for meeting agendas, text matrices, timetable, etc.

### 4.1 Most common types of tables

This section will illustrate the two main types of tables which are **Textual and Numerical**.

**Textual (Word) Tables** are used when you are dealing with qualitative data and they serve the same function as any table: to make the comparison of items easy. These tables are also used when you want to present examples, which may be grouped in a certain way, or when you want to show categories of different items.

**Numerical Tables:** These are the most common types of tables which typically represent quantitative data (sometimes it may present a combination of quantitative and qualitative data). As its name suggests, most of the body of the table consists of specific number values, including descriptive (tabulations such as mean, standard deviation, mode, range or frequency) and inferential (statistical test values) statistics or both.

- **Univariate tables** show information on each variable alone rather than associations among variables. Common types of univariate tables include those that present the distribution of a variable or composition of a sample or descriptive statistics on a series of related outcomes, such as affected group categories. A univariate table can include more than one type of numeric information for each variable. Table 4 includes separate columns for the number and percentage of visited sites for each group type, labelled accordingly.

**Table 4 Univariate Table: Number And Percentage Of Visited Sites, Country X, 2011**

<b>Group type</b>	<b>No. of visited sites</b>	<b>% of sample</b>
IDPs	27	14.3%
Returnees	35	18.5%
Affected population	35	18.5%
Returnees	23	12.2%
<b>Total sample</b>	<b>189</b>	<b>100%</b>

- **Bivariate** (or two-way) tables show the relationship between two variables. Common types of bivariate tables are cross-tabulations, those that present differences in means or other statistics for one variable according to values of a second variable, and correlations. The most common two way table, cross tabulation, shows the joint distribution of two categorical variables and how the overall sample is divided among all possible combinations of those two variables. Table 5 shows how poverty rates differ according to age group, calculated from a cross tabulation of two variables: age group and poverty status. Readers could calculate the number of persons in each poverty category from the total number of persons and the percentage poor in each age group.

**Table 5 Bivariate Table: Poverty Rates (%) By Age Group, United States, 2000**

	Age group (years)			Total
	<18	18–64	65+	
Population (1,000s)	72,653	177,934	34,385	34,570
% Poor	16.7%	10.6%	10.4%	12.1%

- **Three-way tables** present information on associations among three variables or sets of related variables, such as the joint distribution of three categorical variables. One way to show a three-way relationship is to use column spanners. In table 6, the columns contain two variables - gender and age interval - with rows for selected indicators under comparison. The spanner divides the table into sections for males and females. Within each of those spanners is a column for each of the age intervals. This structure facilitates comparison across age intervals within each gender as they are located in adjacent columns. If you want to emphasize comparison of age intervals for males against that for females, place age interval in the column spanner (there would be three such spanners) with columns for each gender arranged underneath.

This type of design works only if the two variables used in the column spanners and the columns below have no more than a few categories apiece. For variables with more categories, use panels or a chart to present three-way relationships.

**Table 6 Three-Way Table: Poverty Rates (%) By Age Group And Sex, United States, 2000**

	Male Age group (years)			Female Age group (years)			Total
	<18	18–64	65+	<18	18–64	65+	
Population	36,326	88,967	17,192	36,326	88,967	17,192	<b>34,570</b>
% Poor	8.35%	5.3%	5.2%	8.35%	5.3%	5.2%	<b>12.1%</b>

## 4.2 Variations in table design

Within the general structure of columns and rows, tables can vary somewhat in design. These structural variations can be grouped into either unidirectional-categorical items, laid out in one direction only (i.e., either across columns or down rows), or bidirectional-categorical items, laid out in both directions.

When a table is structured unidirectional such as table 7 below, categorical items are arranged across the columns or down the rows but not in both directions.

**Table 7 Example Of Unidirectional Table**

Region name	Group type	No. of visited sites
Region North	IDPs	27
	Returnees	35
	Affected population	35
Region South	IDPs	12
	Returnees	54
	Affected population	26
<b>Total</b>		189

On the contrary, when a table is structured bidirectional such as table 8 below, more than one set of categorical items is displayed, and the sets are laid out both across the columns and down the rows. This arrangement is sometimes called a *crosstab* or a *pivot table*.

**Table 8 Example Of Bidirectional Table**

Region name	Group type	Number of visited sites				Total
		jul.11	aug.11	sept.11	oct.11	
Region North	IDPs	27	32	34	37	130
	Returnees	35	38	43	45	161
	Affected population	35	32	28	23	118
Region South	IDPs	12	18	26	32	88
	Returnees	54	58	59	62	233
	Affected population	26	32	25	19	102
<b>Total</b>		189	210	215	218	832

### 4.3 Relationships and table design

Information that we display in tables always exhibits a specific relationship between individual values. The layout of a table is primarily determined by the relationships the table is meant to feature. Two major types of relationship exist, and to each does correspond an appropriate table design, as represented in the table below. The “-“ symbols represent a less preferred option compared to the “+” symbols:

**Quantitative to categorical relationship:** Table of this type are used for looking up one quantitative value at a time. Each value relates either to a single category or to the intersection of multiple categories.

Relationship	Structure type	
	Unidirectional	Bidirectional
Between a single set of quantitative values and a single set of categorical items (Ex. No. of IDPs in camps, Table 2)	X	N/A
Between a single set of quantitative values and the intersection of multiple categories (Ex. No. of visited returnee sites, Table 4)	X	X+
Between a single set of quantitative values and the intersection of multiple hierarchical categories (Ex. No. of visited IDPs sites in region south, Aug 2011, Table 8)	X+	X-

**Quantitative to quantitative relationships:** Tables also allow to examine relationships among multiple quantitative values, primarily to compare values of a single measure (number of affected people) associated with multiple categorical items (e.g. month of January to June), or multiple measures (e.g. Number of males and females) for a single categorical item (e.g. the month of June).

Relationship	Structure type	
	Unidirectional	Bidirectional
Among a single set of quantitative values associated with multiple categorical items (comparing No. of visited sites for IDPs and returnees, table 4)	X	X+
Among distinct sets of quantitative values associated with a single categorical items (comparing No. Of affected families, No. of kits distributed and ratio for Province Romeo, Table 3)	X	X-

#### 4.4 Principles for planning effective tables

**Create focused tables:** Assessment reports generally include several tables, each of which should address one aspect of the overall research question - one major topic or a set of closely related subtopics, or one type of statistical analysis. For instance, a food security assessment performed after a disaster reports on the needs of different livelihood groups and might present information on the number of food insecure people per geographical area (one table), the main coping mechanisms per livelihood groups (a second table), the priorities as expressed by the population (a third table) and the projected food needs under different scenarios (a fourth table).

**Create self-contained tables:** Often tables are used separately from the rest of the document, either by readers in a hurry to extract information or as data sources that become detached from their origins. As shown in table 9, label each table so your audience can understand the information without reference to the text. Using the title, row/column headings, and notes, they should be able to discern the following:

- The purpose of the table
- The context of the data (the who, what, where, when of the data)
- The location of specific variables within the table
- Coding or units of measurement for every number in the table
- Data sources
- Definitions of relevant terms and abbreviations

**Table 9 Summary Affected Figures, 74 Unions Assessed, Bangladesh Floods, 28 Oct 2011**

*Summary table of humanitarian profile for the Bangladesh affected population following October floods in 9 Districts covered by field assessments. According to the ratio of affected population, Tala, SathkiraSadar and Satkhira districts are the most affected.*

District/Upazilla	No. of Union covered	Total families	Affected families	% of affected families
Jessore	8	40,025	12,208	31%
Keshopur	4	23,376	6,927	30%
Manirampur	4	16,649	5,281	32%
Satkhira	33	158,729	60,076	38%
Assassuni	4	16,348	2,777	17%
Debhata	4	24,723	4,016	16%
Kaloroa	5	11,053	1,800	16%
SakthiraSadar	8	40,788	17,452	43%
Tala	12	65,817	34,031	52%
<b>Grand Total</b>	<b>74</b>	<b>198,754</b>	<b>72,284</b>	<b>36%</b>

\* Source RC/RC, enumeration of affected families per district, aggregated by government District Disaster councils  
Affected = Sum of displaced and non-displaced persons as a direct result of the crisis

#### 4.5 Table or Graph?

When you are at the point of showing data, you should consider using tables rather a graph.

Tables *make it easy to look up values* and are the best tools in displaying simple relationships between quantitative values and their categorical subdivisions so that the values can be individually located and considered.

Tables also make easy to compare pairs of related values and facilitate local comparisons because their structure is simple and the quantitative values are encoded as text, which is easier to be understood.

The textual encoding of tables offers a level of precision that graphs cannot provide. It is easier to express a number using a text and be as much specific as you wish than using the visual encoding of individual numbers in graphs which does not provide this precision.

Another important strength of tables is that they include multiple set of quantitative values that are expressed in different units of measure. By using tables, you can represent for example the number of affected people, their location and their total population ratio and provide a severity estimate, which will be more difficult doing by using only graphs since they generally contain a single (or two) quantitative scale and unit of measure.

However, although it is recommended to use tables rather than graphs in most of the times, the use of tables is not recommended when you want to show a trend or a relationship between variables; this is best represented by graphs or charts.

**Table 10 Comparison Of Tables And Graphs Objectives**

<b>Tables</b>	<b>Graphs</b>
When precise values are required	When the message resides in the shape of the data
Wish to show both details and their sums.	Wish to feature patterns, trends and exceptions
Looking up individual values	Showing large numbers of values
Comparing individual values	Reveal relationships among multiple values
Including multiple units of measure	

### 4.6 Table usability

Reading a table is a repetitive task, and an effective design allows people to clearly see the data as they become familiar with it. Tabular presentation of data allows data to be organized for further analysis, allows large amounts of raw data to be sorted and reorganized in a neat format, and allows the inclusion of only the most important or relevant data. It also facilitates a dialogue between the text and the exact numbers in your results, so that you don't have to describe all the specific numerical values in your report.

What might affect the table usability is the user's ability to quickly make use of table data, his familiarity with tabular format, the complexity of the data, and how the table design matches the purpose of the report. When about to design a table, remember that the final user will have a lot of processing and mental tasks going-on, such as:

- **Reading headings:** To read a table, users read the columns and row headings.
- **Global scanning:** Users might scan the whole table to get a sense of its structure, organization and complexity.
- **Visual search:** To locate data, users scan across a row or down a column till the cell that holds the value. Visual search is faster when users are familiar with the tabular format, which provides a consistent structure for locating information.
- **Information extraction:** Once the needed data has been located, users extract the single facts included in the table.
- **Comprehension:** Users attempt to understand the values they extract from the table in light of their own knowledge.
- **Identifying groupings and trends:** Users often tend to mentally group data in similar groups and look for trends, but as mentioned before, graphs are better for that.
- **Comparison:** Users will compare data and seek patterns.
- **Interference:** Users will attempt to understand the data on a deeper level by drawing conclusions.
- **Interpretation:** Users may draw from their own body of knowledge to give meaning to the data.
- **Recall:** Users may need to remember the information in the table and use this information when the table is not at hand.
- **Decisions:** Users may need to make decisions from their interpretation of the data.

## 4.7 Table anatomy

**Title:** The title provides a brief description of the contents of a table. It should be concise and include key elements of the data you want to compare like groups, classifications, variables, etc. Across your document, it is important to find a basic table “look” and use it for all tables and try to be consistent. The title should never be more than two lines and should be bold, underlined or italicized. The first letter of each word should be capitalized. If the title is two lines long, the lines can be either single-spaced or double-spaced depending on the style used. The title can also be used as the table legend and it should always go above the table. The following key principles apply to all table titles:

- **Individualize:** Write a title for each table to convey the specific topics or questions addressed in the table. In documents that include several tables or charts, create individualized titles to differentiate them from one another and to convey where each fits in the overall scheme of your analysis.
- **Topic:** In the title, name each of the major components of the relationships illustrated in that table. To avoid overly long titles, use summary phrases or name broad conceptual categories such as “demographic characteristics”, “price evolution” or “coverage” rather than itemizing every variable in the table (the individual items will be labeled in the rows or columns).
- **Context:** Specify the context of the data by listing the W’s in the table title: where and when the data was collected, and if pertinent, restrictions on who is included in the data (e.g., certain age groups). If the data are from a specific survey (such as a food security assessment) or institution (e.g., university, Cluster or UN agency), include its name in the title or in a general note below the table. Minimize abbreviations in the title. If you must abbreviate, spell out the full wording in a table note.
- **Units:** State the units of measurement, level of aggregation, and system of measurement for every variable in the table. This seemingly lengthy list of items can usually be expressed in a few words such as “price (\$)”, “percentage (%)” or “Metric Tons (MT)”. Whenever possible, generalize units for the table rather than repeating them for each row and column. If the same units apply to most numbers in the table, specify them in the title. If there isn’t enough space in the title, or if the units vary, mention units in the column or row headings.
- **Table number:** Tables should be numbered in the order they are referred to in your report, as for example Table 1, Table 2, and so on.

**Row labels and units:** Name the concept for each row and column in its associated label so readers can interpret the numbers in the interior cells of the table.

- **Units:** If the units of measurement differ across rows or columns of a table, mention the units in the pertinent row or column label. A table of descriptive statistics for a study of infant health might include mean age (in days), weight (in grams), length (in centimeters), and gestational age (in weeks). With different units for each variable, the units cannot be summarized for the table as a whole. Do not assume that the units of measurement will be self-evident once the concepts are named: without labels, readers might erroneously presume that age was measured in months or years, or weight and length reported in British rather than metric units.
- **Abbreviations:** Minimize use of abbreviations or acronyms in headings. If space is tight, use single words or short phrases. Explain the concepts measured by each variable as you describe the table so the brief monikers will become familiar. If readers need to see a long or complex wording, refer them to an appendix that contains that part of the original data collection instrument. For a lay audience, replace technical labels with everyday synonyms.
- **Indenting:** When organizing rows in a table, place categories of a nominal or ordinal variable in consecutive rows under a single major row header with the subcategories indented. Counts and percentages for groups that are indented equally can be added together to give the total.
- **Panels:** Use panels - blocks of consecutive rows within a table separated by horizontal lines (“rules”) or an extra blank row - to organize material within tables. Arrange them one above another with column headings shared by all panels. Panels can introduce another dimension to a table, show different measures of the relationship in the table, or organize rows into conceptually related blocks.

**Columns headings and sub-headings:** While data represents the body of a table, headings and sub-headings allow you to establish an order to the data by identifying columns. They should be written in singular form unless they refer to groups (e.g. Male, Female). The first letter should also be capitalized. Headings are the key words that best describe the columns beneath them. On the contrary, when the column heading is above the leftmost column, this is often referred to as the “stub head” and the column is the “stub column”. The data in the stub column is known as the “stub”. All other column headings are simply referred to as “column heads”. Units should be specified in column headings when applicable. Repeat column and row headers at the top of each page when tables extend onto multiple pages.

- **Labels, notes and units:** Each column heading identifies the variable or measure (e.g., mean, %, number, etc.) in that column. The guidelines listed above for labeling abbreviations, notes, and units in rows also apply to columns. If most numbers in a large table are measured in the same unit, use a spanner across columns to generalize with a phrase such as “percentage unless otherwise specified,” then name the units for variables measured differently (e.g., in years of age or price in dollars) in the labels for the appropriate columns.

- **Column Spanners:** Column spanners (also known as “straddle rules”) show that a set of columns is related, as much as indenting shows how a set of rows is related. They refer to the headings above two or more columns to indicate a classification or a grouping of the data in those columns. A column spanner may also represent units.

The **table spanner** is located in the body of the table in order to divide the data in a table without changing the columns. Spanners go the entire length of the table and they often used to combine two tables into one in order to avoid repetition. A table spanner may be written in the plural form.

**Table body:** is the actual data in a table in the columns, for example, percentages, frequencies, means, “X” number of samples, etc.).

**Interior Cells:** Report your numbers in the interior cells of the table. Refer to section 5.9 of this document for number of digits and decimal places. If there is no data, number or value to report for one or more cells in your table, type a symbol in place of the numeric value and include a footnote explaining the missing value.

**Rules/Dividers** are the lines that frame the top and bottom of the table, and mark the different parts of a table. They are also often used for emphasis within the body of a table.

**Tables Notes** are used to explain anything which is not self-explanatory within the table. They can be abbreviations or other technical terms or issues which need to be explained. They can be visible through an asterisk on the first note with its explanation notes under the table.

- **Put information that does not fit easily in the title, row, or column labels in notes to the table:** Spell out abbreviations, give brief definitions, and provide citations for data sources or other background information. To keep tables concise and tidy, limit notes to a simple sentence or two, referring to longer descriptions in the text or appendixes if more detail is needed. If a table requires more than one note, label them with different symbols or letters, rather than numbers, which could be confused with exponents, then list the notes in that order at the bottom of the table following the conventions for your intended publisher. Letters also allow the reader to distinguish table notes from text notes.
- **Secondary data:** If you are using secondary data, provide a source note to each table, citing the name and date of the data set or a reference to a publication that describes it. If all tables in your report or presentation use data from the same source, you might not need to cite it for every table. However, if writing academic articles, some journals or publishers require the data source to be specified in every chart or table, so check the applicable guidelines.

Table 11 below details visually the anatomy of a table and name and locate each of the components previously mentioned in this section.

Table 11 Average Monthly Troop Levels By War, Fy2006-Fy2012

Troop Levels and Estimated Costs		2006-2012 PERIOD						
		FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012
VARIABLES		AFGHAN WAR						
In-Country Average Troop Levels		20,417	23,658	30,142	50,700	63,400	63,450	63,350
Average BCTs In-Country/a/		2.3	2.6	3.3	5.6	7.1	7.1	7.0
Percent Annual Change		7	16	27	68	25	0	0
Share of Total (%)		13%	14%	16%	27%	42%	60%	94%
		IRAQ WAR						
In-Country Average Troop Levels		141,100	148,292	157,775	135,600	88,300	42,750	4,050
Average BCTs In-Country/a/		15.7	16.5	17.5	15.1	9.8	4.8	0.5
Percent Annual Change		-2	5	6	-14	-35	-52	-91
Share of Total (%)		87%	86%	84%	73%	58%	40%	6%
Row label	<p><i>Sources:</i> White House, "Responsible Ending the War in Iraq," Speech by President Obama at Camp Lejeune, North Carolina, February 27, 2009; <a href="http://www.whitehouse.gov/agenda/iraq/">http://www.whitehouse.gov/agenda/iraq/</a>; White House, "Statement by the President on Afghanistan," February 17, 2009; <a href="http://www.whitehouse.gov/the_press_office/Statement-by-the-President-on-Afghanistan/">http://www.whitehouse.gov/the_press_office/Statement-by-the-President-on-Afghanistan/</a>; Joint Staff, Joint Chiefs of Staff, "Boots on the Ground Reports."</p>							
Interior Cell	<p><i>Notes:</i> Italics indicate CRS estimates. CRS calculated annual averages, year-to-year changes and average Brigade Combat Team (BCT) equivalents, assuming 9,000 troops for each BCT including support elements. CRS modified the standard Army planning factor of 10,000 troops per BCT with support to reflect the generally smaller size of Marine Corps units; this approach also assumes that Navy and Air Force troops in-country are providing support to ground units.</p>							

## 5. Best practices

Best practice in tabular presentation involves designing tables which can be read **easily** and **quickly**. The following tips will make your table design most effective by playing with contrast, alignment, spacing, ordering and other important features of the table.

### 5.1 Meet the audience’s expectations

The more familiar users are with a table grid, the faster they can search it to extract the data. You can meet the expectations of the audience by sticking to the conventions they expect, which are defined by the purpose of the table.

The critical factor regarding the reader’s expectations is that someone reading an assessment report will very likely have read many other assessment reports and will have an idea of how the information is expected to be presented to them. Indeed, your table may contain the most useful and important figures, but may often be read completely out of context of any other content. For this reason, the table format needs to convey its information in as clear and concise way as possible while in an entirely expected format that the reader will find or be used to finding in other assessment reports.

The tables 12 below contain identical sets of information. However the first table is far too descriptive and fails to convey the most important information (the highest number of “Yes” and “No” reported by key informants). Also, the first data row displays an explanatory element of the table (the number of key informants interviewed) and should not be placed so prominently as to suggest it is an actual result of the assessment, while only a contextual information which can be referenced as a table note.

**Table 12 Answer To The Question: *is there a problem in your community because children are not in school or are not getting a good enough education?* Philippines, 2011**

#### DON'T

Answers	Bukidnon	Misamis Oriental	Lanao Del Norte	Norte Lanao Del Sur	Total
<b>Key informants</b>	28	35	54	20	<b>137</b>
<b>Yes</b>	4	17	26	15	<b>62</b>
<b>No</b>	18	15	26	1	<b>60</b>
<b>Don't Know</b>	6	3	2	4	<b>14</b>

#### DO

Answers	Bukidnon	Misamis Oriental	Lanao Del Norte	Lanao del Sur	Total
Yes	4	17	26	15	62
No	18	15	26	1	60
Don't know	6	3	2	4	14
<i>*Key informants</i>	28	35	54	20	136

## 5.2 Order data to match the purpose of the table

Province	No. of aff. Pop.	
Alpha	135,000	Structure and arrange the data to facilitate how it will be used. If the purpose of a table is to compare the affected provinces in terms of number of affected population, then organize the data from largest to smallest rather than alphabetically by location. If the purpose is to show the increase of security incidents during the last year, then arrange the data by time.
Echo	127,000	
Charlie	98,000	
Bravo	76,000	
Delta	52,000	

Items in a table should be ordered in such a way as to promote the purpose for which the table is being used. Consider the tables 13 below. The table on the left is intended to convey the total of resettlements undertaken by agency X. As the total number of resettlement is the value of interest, the rows of the table are ordered according to that value – i.e. in descending order of resettlement number. This allows the item that is most likely to be of interest to appear in priority position at the top of the table.

However, if the reader was actually interested in the top 5 countries were most refugees were resettled, he has to work hard in order to find which nationality was the most assisted, and the table on the right would be a better way of displaying the data.

Note how the column that is of most interest (the ordered column) appears to the left of any unordered columns. The further left a column, the more important it is perceived, although the first column is usually reserved for the object names or keys and all subsequent columns for the object data or values.

**Table 13 Resettlement Data, Top 10 Countries, 2010**

Country of origin	Country of asylum	Resettlement Total	Assisted	Country of origin	Country of asylum	Resettlement Assisted	Total
Ethiopia	Kenya	409	356	Ethiopia	Kenya	356	409
Burundi	Tanzania	221	201	Afghanistan	Tajikistan	97	107
Liberia	Sierra Leone	118	115	Colombia	Costa Rica	85	113
Colombia	Costa Rica	113	103	Colombia	Ecuador	84	94
Afghanistan	Tajikistan	107	97	Burundi	Tanzania	56	221
Congo	Gabon	102	80	D.R.C.	Kenya	51	58
Colombia	Ecuador	94	84	Eritrea	Saudi Arabia	49	50
D.R.C.	Kenya	58	38	Congo	Gabon	48	102
Afghanistan	Pakistan	57	47	Afghanistan	Pakistan	39	57
Eritrea	Saudi Arabia	50	35	Liberia	Sierra Leone	26	118

### 5.3 Boost context: use Sparklines

A sparkline is a small chart, typically drawn without axes or coordinates. It helps bring meaning and context to numbers being reported and, unlike a chart, are meant to be embedded into what they are describing. When inserted in a table, sparklines lets you easily apprehend and analyse the most important data in graphical terms.

Province	Nber of aff. Pop.	
Alpha	135,000	
Bravo	127,000	
Charlie	98,000	
Delta	76,000	
Echo	52,000	

### 5.4 Remove clutter, highlight important segments

In order for the information in the table to speak for itself, it needs not to be swamped by the surrounding decoration and other content. To enable quick scanning and understanding, focus on the data which is most relevant for the purpose of your reports; remove all extraneous information so to avoid clutter around the body of the table. The left table 13 below is a good example of lack of differentiation of figures due to the excessive strengths of the cell borders.

Clutter should be removed from cells, rows, columns, headers and also the surrounding content, in order to reduce the table to its bare minimum. After stripping back, the importance of specific values can be promoted, for example in the right table 14 below, the row for Afghanistan has been slightly highlighted as the row of interest, and the totals have been emboldened.

Table 14 Resettlement Data, Top 10 Countries, 2010

DON'T

Country of origin	Country of asylum	Resettlement	
		Total	Assisted
Ethiopia	Kenya	409	356
Burundi	Tanzania	221	201
Liberia	Niger	118	115
Colombia	Costa Rica	113	103
Afghanistan	Tajikistan	107	97
Congo	Gabon	102	80
Colombia	Ecuador	94	84
D.R.C.	Kenya	58	38
Afghanistan	Pakistan	57	47
Eritrea	Ethiopia	50	35

DO

Country of origin	Country of asylum	Resettlement	
		Total	Assisted
Ethiopia	Kenya	409	356
Burundi	Tanzania	221	201
Liberia	Niger	118	115
Colombia	Costa Rica	113	103
Afghanistan	Tajikistan	<b>107</b>	<b>97</b>
Congo	Gabon	102	80
Colombia	Ecuador	94	84
D.R.C.	Kenya	58	38
Afghanistan	Pakistan	57	47
Eritrea	Ethiopia	50	35

### 5.5 Create a visual hierarchy

Use typography to create emphasis and to guide the reader’s eye. For example, headings can be larger or in bold type and they can provide better emphasis. Visual cues can make a table easier to read so readers know what’s most important.

In the table 15 below, a single set of population information for different age groups is split into several geographical areas but still form a single entity. The overall header clearly states the headers (Axe, camp/sites) and the age interval units. The same colour is used to fill the sub total rows for each geographical area and also fulfil a demarcation role with the next sub table.

The tables are physically connected only by the background colour of the “Male 5-11” column, not only linking the data but further promoting this particular column as being of most importance.

The header and the rows which total the (sub) values use heavier weight font and background colour in order to guide and draw the eye to these items of information. The total figures in the last row are intended as the key values in the table.

The reader has no extra work to do to see what the critical items of information are, and the paths below show the movement of the eye visually scanning the table in five quick separate movements, analysing relevant headers, labels and values.

**Table 15 Sex And Age Data For IDPs Less Than 12 Years Old, Country X, 2010**

		Sex and age					
1	Axe	Camps / Sites	F 0-4	M 0-4	F 5-11	M 5-11	Grand Total
	Ayorou	Gaoudel	45	37	43	34	192
		Mbeidoun	40	62	50	59	272
		Tabareybarey	50	35	72	50	220
2	<b>Ayorou total</b>		<b>135</b>	<b>134</b>	<b>165</b>	<b>143</b>	<b>684</b>
	Filingue	Abala	35	30	50	34	187
		Kizamou	4	3	5	7	21
		Miel	19	16	20	13	82
		Tigzefan	2	3	5	5	18
3	<b>Filingue total</b>		<b>60</b>	<b>52</b>	<b>80</b>	<b>59</b>	<b>308</b>
	Ouallam	Chinegodrar	22	16	22	19	99
		Mangaize	149	151	165	105	669
4	<b>Ouallam total</b>		<b>171</b>	<b>167</b>	<b>187</b>	<b>124</b>	<b>768</b>
5	<b>Grand Total</b>		<b>368</b>	<b>361</b>	<b>438</b>	<b>331</b>	<b>1,785</b>

### 5.6 Round numbers, avoid questioning

Extra digits are another example of clutter. Where the reader is unlikely to have an interest in absolute accuracy, there is no need to include the extra detail as it prevents the reader from visually scanning the content quickly. It is recommended to use rounded integers since it makes easier to read and to spot trends.

In the following table 16, the need to know the percentage of shared priorities to the nearest hundredth is certainly absent, and its presentation certainly misleading, suggesting that this is real measured and accurate data – which it is not. Present only the accuracy the user needs and that does not bring into question the validity of the data being presented. Few would have reason to question the truth of the data shown in the right table, but many would doubt whether shared priorities can really be measured with such precision in the left table.

However, this may not be appropriate for scientific data provided to experts but only to a general public who do not need detailed accuracy.

Consider how the numbers will be used to determine whether rounding makes sense. It is recommended using no more than one decimal place in most cases. Another useful practice for formatting numbers in table is to place a comma to the left of every three whole numbers-digit 9 e.g. 1,393,033 rather than 1393033). Use either a negative sign or parentheses to display negative numbers like for example -8,395.37 or (8,395.37). If you use parentheses, keep the numbers that are enclosed in the right aligned with the positive numbers.

**Table 16 Priorities Of Population Concerning Shelter (%), Haiti, 2010**

DON'T				DO			
Priority	Category	Urban	Rural	Priority	Category	Urban	Rural
1	Shelter	66.752%	65.078%	1	Shelter	66.7%	65.0%
2	Cooking set	47.472%	47.202%	2	Cooking set	47.4%	47.2%
3	Mosquito net	55.857%	63.161%	3	Mosquito net	55.8%	63.1%
4	Fuel	16.656%	11.620%	4	Fuel	16.6%	11.6%
5	Container	54.747%	44.623%	5	Container	54.7%	44.6%
6	Water	63.374%	67.052%	6	Water	63.3%	67.0%
7	Other	49.841%	29.586%	7	Other	49.8%	29.5%

### 5.7 Perform computations for users

When possible, don't ask users to perform arithmetic computations or mental transformations with the data. Instead, do this for them by providing summary information in an additional row or column, such as total, change or average. This facilitates quicker comprehension and interpretation.

In the left table 17 below, while it would not fit the expectation of the audience to modify it in any way, a useful extension would be to add a column which prevents the reader from having to calculate the year on year change for each value and to determine whether the change has been an increase or a decrease.

The left table 17 already performs the totalling of the number of cholera cases, but the right table adds a new column to the table, making it much easier to analyse the results and see where the most significant changes have been.

**Table 17 Comparison Of Cholera Cases, Zimbabwe, 2010-2011**

DON'T			DO			
Districts	2010 cases	2011 cases	Districts	2010 cases	2011 cases	Change
Beitbridge	17	0	Beitbridge	17	0	● -17
Bikita	9	43	Bikita	9	43	● 34
Bindura	2	0	Bindura	2	0	● -2
Buhera	130	64	Buhera	130	64	● -66
Chegutu	32	1	Chegutu	32	1	● -31
Chimanimani	66	28	Chimanimani	66	28	● -38
Chipinge	39	697	Chipinge	39	697	● 658
Chiredzi	54	219	Chiredzi	54	219	● 165
Chivi	13	0	Chivi	13	0	● -13
Harare	4	0	Harare	4	0	● -4
Hurungwe	171	0	Hurungwe	171	0	● -171
Kadoma	160	2	Kadoma	160	2	● -158
Makonde	3	0	Makonde	3	0	● -3
Mangwe	1	0	Mangwe	1	0	● -1
Masvingo	10	0	Masvingo	10	0	● -10
Mt Darwin	11	0	Mt Darwin	11	0	● -11
Murewa	0	5	Murewa	0	5	● 5
Mutare	206	80	Mutare	206	80	● -126
Mutasa	0	1	Mutasa	0	1	● 1
Mwenezi	5	0	Mwenezi	5	0	● -5
UMP	4	0	UMP	4	0	● -4
<b>Total</b>	<b>937</b>	<b>1140</b>	<b>Total</b>	<b>937</b>	<b>1140</b>	<b>203</b>

### 5.8 Guarantee a consistent look

When users search for information in a table, they expect the information to be displayed in a consistent manner. You can ensure there is consistency in the typeface of similar elements, in the alignment of similar data and in the emphasis of elements, such as column headings.

Consider the table 18 below. The variation on typefaces for headers, labels and totals; the centralised nature of the headers compared to the values; the misalignment of the totals compared to the individual values; the use of different colours in order to try and represent the difference between axes, and the use of different line thicknesses to separate the tables from the single header all go to actually provide the impression of a badly thought out and disjointed appearance which makes it much harder for the reader to visually scan the content and pick out the areas of interest.

**Table 18 Sex And Age Data For IDPs 0-11 Years Old, Country X, 2010**

**DON'T**

Axe	Camps / Sites	Sex and age				Grand Total
		F 0-4	M 0-4	F 5-11	M 5-11	
Ayorou	Gaoudel	45	37	43	34	192
	Mbeidoun	40	62	50	59	272
	Tabareybarey	50	35	72	50	220
<b>Ayorou total</b>		<b>135</b>	<b>134</b>	<b>165</b>	<b>143</b>	<b>684</b>
Filingue	Abala	35	30	50	34	187
	Kizamou	4	3	5	7	21
	Miel	19	16	20	13	82
	Tigzefan	2	3	5	5	18
<b>Filingue total</b>		<b>60</b>	<b>52</b>	<b>80</b>	<b>59</b>	<b>308</b>
Ouallam	Chinegodrar	22	16	22	19	99
	Mangaize	149	151	165	105	669
<b>Ouallam total</b>		<b>171</b>	<b>167</b>	<b>187</b>	<b>124</b>	<b>768</b>
Tillia	Agando	2	7	3	4	20
	Chinwaren	0	1	3	1	5
<b>Tillia total</b>		<b>2</b>	<b>8</b>	<b>6</b>	<b>5</b>	<b>25</b>
<b>Grand Total</b>		<b>368</b>	<b>361</b>	<b>438</b>	<b>331</b>	<b>1,785</b>

### 5.9 Align with logic

Intelligent use of alignment makes a table easier to read. Align all numbers, commas and decimal points with each other. Structure the table so it is clear that the data is aligned with headings and the grid in general.

Numbers that represent quantitative values, as opposed to those that are merely identifiers (villages ID numbers, women and men sex, etc.) should always be aligned to the right. This holds also true for all units of measure, including currencies and percentages. Aligning numbers on the left or centred make them difficult to interpret.

In the left table 19 below, values are horizontally centred; headers are misaligned; text and values are not aligned with headers. This all reduces the cohesive nature of the data – marking out each element as an individual item to be processed, rather than a single entity which can be quickly scanned. The figures are hard to compare not just between the two columns, but also from one row to the next, due to the non-alignment of the digits. The greater the number of different horizontal and vertical lines that can be drawn marking out the extents of the data contained, the harder it is to process. The big picture as well as the detail of the data is much better presented in the right table 19 where text and values have been aligned to the headers.

**Table 19 Number Of Affected Population And Damaged Homes, Pakistan Floods, 2010**

DON'T			DO		
Province	Persons affected	Homes damaged	Province	Persons affected	Homes damaged
Baluchistan	1,060,162	75,261	Baluchistan	1,060,162	75,261
Gilgit-Baltistan	8,561	2,820	Gilgit-Baltistan	8,561	2,820
KPK	4,365,909	181,433	KPK	4,365,909	181,433
Punjab	8,200,000	500,000	Punjab	8,200,000	500,000
Sindh	3,740,678	470,910	Sindh	3,740,678	470,910
Total	17,620,310	1,237,493	Total	17,620,310	1,237,493

As a side rule for values with decimal numbers, round off all figures to the same number of places after the decimal point, even whole numbers (see table on the right). Place a percentage sign (i.e. %) immediately to the right of every percentage value.

Dates should be aligned to the left and use a format that keeps the number of characters in each elements of a date like month, day, year constant (e.g. 01/02/03 rather than 1/2/03). With this method, although dates are left aligned in the column but they are in fact aligned along their right edges as well (table 20).

	SAM (%)
Province C	12.7%
Province E	11.0%
Province A	9.2%
Province D	6.0%
Province B	5.6%
Province F	4.0%
Province G	2.0%

**Table 20 Number Of IDPs In XX IDP Camp Per Registration Exercise, Country X, 2011**

<b>DON'T</b>		<b>DO</b>	
Registration date	No. of IDPs	Registration date	No. of IDPs
1/2/2011	23,452	01/02/2011	23,452
8/4/2011	26,985	08/04/2011	26,985
3/7/2011	28,623	03/07/2011	28,623
12/10/2011	29,225	12/10/2011	29,225
28/12/2011	31,231	28/12/2011	31,231

Like shown in table 19, text that expresses neither numbers nor dates should also be aligned to the left. Don't be tempted by the aesthetic appeal of centred text in the columns of tables. The ragged left edge of the text makes scanning less efficient than the consistent leading edge of the left-aligned text.

However, in the case that the text entries consist of the same number of characters and the column header consists of several more characters than the text entries, centred alignment should be considered, as shown in the table 21 below.

**Table 21 List Of Affected Settlements In District 12, Country X, 2011**

<b>DON'T</b>		<b>DO</b>	
<b>P-Codes District 12</b>	<b>Affected?</b>	<b>P-Codes District 12</b>	<b>Affected?</b>
D-12035	Y	D-12035	Y
D-12036	Y	D-12036	Y
D-12037	N	D-12037	N
D-12038	N	D-12038	N
D-12039	Y	D-12039	Y
D-12040	Y	D-12040	Y
D-12041	N	D-12041	N

Using centred alignment rather than left aligning has also other advantages such as not producing an irregular left edge and not making reading impaired, and adding more white space to the left and right of the text entries, thus making a clearer distinction of the data from the adjacent columns.

Dates may also be centred aligned when their widths are formatted so that they don't vary from date to date and the column header is significantly wider than the dates. In the case a header is used to label multiple columns, centring it across those columns often helps to clarify that it refers to all of those columns rather than just a single column.

### 5.10 Use high contrast

To increase legibility, provide sufficient contrast between foreground and background to allow the reader to process the data quickly. A common practice is to colour the rows or the columns, but choose poor colours to do this and the background starts to mix with the foreground reducing the separation between figure and ground.

Compare the left and right tables 22 below. The left table uses a relatively low contrast between the text of the foreground (figure) and the blues of the background (ground), whereas the right table has very high contrast between the two, making it much easier to read, because the eye is better able to separate rows.

The shading of rows or columns should be just enough as to guide the eye along a row or column and no more. Headers should be just different enough from the main body of the table content that they are distinguishable as headers, but not so different that they become the figure and start pushing the main data into the ground.

**Table 22 Comparison Of Cholera Cases, Zimbabwe, 2010-2011**

DON'T			DO		
Districts	2010 cases	2011 cases	Districts	2010 cases	2011 cases
Beitbridge	17	0	Beitbridge	17	0
Bikita	9	43	Bikita	9	43
Bindura	2	0	Bindura	2	0
Buhera	130	64	Buhera	130	64
Chegutu	32	1	Chegutu	32	1
Chimanimani	66	28	Chimanimani	66	28
Chipinge	39	697	Chipinge	39	697
Chiredzi	54	219	Chiredzi	54	219
Chivi	13	0	Chivi	13	0
Harare	4	0	Harare	4	0
Hurungwe	171	0	Hurungwe	171	0
Kadoma	160	2	Kadoma	160	2
Makonde	3	0	Makonde	3	0
Mangwe	1	0	Mangwe	1	0
Masvingo	10	0	Masvingo	10	0
Mt Darwin	11	0	Mt Darwin	11	0
Murewa	0	5	Murewa	0	5
Mutare	206	80	Mutare	206	80
UMP	4	0	UMP	4	0
<b>Total</b>	<b>932</b>	<b>1139</b>	<b>Total</b>	<b>932</b>	<b>1139</b>

5.11 Legibility

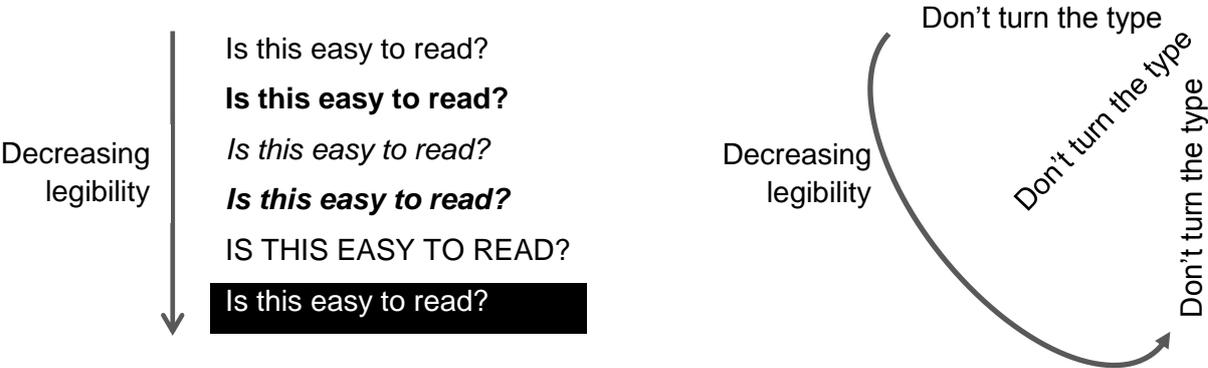
With hundreds of available typefaces with different styles and weight - serif, sanserif, italic, all caps, light, medium, bold and black - choosing type can be a daunting task. In the end though, type in table is meant to describe the information and not to adorn. In that perspective, typography should be chosen purely on the merit of legibility.

Fonts should be easy to read to allow effective communication. The use of extravagant font only for aesthetic purpose will reduce the efficiency of communication. Fonts that are most legible tend to have a clean and simple design. The use of serifs or sans serifs<sup>1</sup> is recommended as they do not undermine the clean and simple appearance of the table. The list below is not exhaustive but provides few examples of good font readily available in most computer users:

Fine legibility		Poor legibility	
Serif	Sanserif	Serif	Sanserif
Times New Roman	Arial	<i>Script</i>	<b>Gill Sans Ultra</b>
Palatino	Verdana	<b>Broadway</b>	Papyrus
Courier	Tahoma	<b>Old English</b>	Tempus sans ITC

Basic rules of type legibility include:

- For your tables, use a type size consistent with that in your text - no more than one or two points smaller. Don't set type too small or too condensed (condensed)
- Whether it is serif or sanserif, keep the style simple. Use **bold** or *italic* only to emphasize a point. Don't use **bold and italic** at the same time.
- Don't use ALL CAPS. Avoid knocking **white type out of black** or color. Don't use highly stylized fonts (*stylized*). Don't track the type (this is tracking).
- Keep typography simple. Headers can be either bold or a couple of sizes larger.
- Use bold to increase legibility on a shaded background or to emphasize a segment. However, don't set a huge amount of text in bold. Emphasizing everything means nothing gets emphasized.



<sup>1</sup> Serif type has a stroke added to the beginning or end of the main stroke of the letter. Sanserif type means "letter without serifs"

### 5.12 Reduce the number of columns

In order not to make the user have to store and recall too much information, it is recommended not to have too many columns of information.

For each column, the reader will have to remember the context of the column as they scan across the rows. Readers can scan quickly down a single row, but find it harder to scan across many columns to relate connected data. For this reason it is usually rows that are highlighted rather than columns – to guide the eye across.

Due to the small size of visual memory and the difficulty of searching through complex information, it is better to reduce the number of columns when possible (7-10 columns maximum). If necessary, divide the table into two or swap columns and rows. The table 23 below has two rows and 13 columns. It is next to impossible to make sense of this without the reader having to process the data and keep referring between the header and the value to see how it relates. In the next tables, the exact same information is presented using more rows instead of columns and it is clear that the reader can much more quickly get an impression of trends by scanning down the columns. Significant values are picked out much faster especially if emphasis is given through the use of highlighting features.

**Table 23 Evolution Of Sorghum Price Per Month In Cfa, Niger, 1994**

#### DON'T

Market	Jan-94	Feb-94	Mar-94	Apr-94	May-94	Jun-94	Jul-94	Aug-94	Sep-94	Oct-94	Nov-94	Dec-94
Birni N'Konni	51,250	50,500	59,400	68,200	60,000	61,000	64,000	66,600	56,500	58,600	52,170	63,500
% change		-1	18	15	-12	2	5	4	-15	4	-11	22

#### DO

Date	Price (CFA)	% Change
01/01/1994	51,250	
01/02/1994	50,500	-1
01/03/1994	59,400	18
01/04/1994	68,200	15
01/05/1994	60,000	-12
01/06/1994	61,000	2
01/07/1994	64,000	5
01/08/1994	66,600	4
01/09/1994	56,500	-15
01/10/1994	58,600	4
01/11/1994	52,170	-11
01/12/1994	63,500	22

#### DO

Date	Price (CFA)	% Change
01.01.1994	51'250	
01.02.1994	50'500	 -1
01.03.1994	59'400	 18
01.04.1994	68'200	 15
01.05.1994	60'000	 -12
01.06.1994	61'000	 2
01.07.1994	64'000	 5
01.08.1994	66'600	 4
01.09.1994	56'500	 -15
01.10.1994	58'600	 4
01.11.1994	52'170	 -11
01.12.1994	63'500	 22

### 5.13 Make it easy to compare numbers

For a table with multiple data series, do not present the comparative data horizontally. It is easier for the reader to analyse data vertically.

In the previous tables 23, we saw that the user can much more easily determine trends and compare numbers when they are in the same column – allowing for the eye to scan down the column very quickly as compared with the great difficulty of comparing the same numbers in a long row. Side by side comparisons seem to be easier for people to make than above-below comparisons. In light of this, construct your tables so users will compare data between columns. In addition, the eye can run down a column rather quickly than across rows.

In the right table 24 below, which has all table decoration removed, we can easily compare the 2010 and 2011 figures. This is done very easily when shown side by side, as compared to the left table 24 where 2011 figures are shown below 2010 figures. Because of the way that columns are more distinctly recognized and processed as separate entities, the right table appears as two groups of information; whereas the left table appears as 10 groups of information.

**Table 24 Comparison Use Of Columns Vs Rows**

<b>DON'T</b>											<b>DO</b>	
<b>2010</b>	17	9	2	130	32	66	39	54	<b>349</b>		<b>2010</b>	
<b>2011</b>	0	43	0	64	1	28	697	219	<b>1,052</b>			<b>2011</b>
												17
												0
												43
												0
												130
												64
												32
												1
											66	
											28	
											39	
											697	
											54	
											219	
											<b>349</b>	
											<b>1,052</b>	

**DO... If you want to compare country values**

	Country A	Country B	Country C
Food insecurity (%)	7%	9%	6%
GAM (%)	23%	15%	21%
SAM (%)	6%	3%	9%

**DO... If you want to compare indicators values**

	Food insecurity (%)	GAM (%)	SAM (%)
Country A	7%	23%	6%
Country B	9%	15%	3%
Country C	6%	21%	9%

### 5.14 Group similar data

If it is possible, organize the data into subgroups and subcategories without altering the purpose of the table, this can improve search and make it easy to compare similar data.

Consider for example the tables 25 below, showing sex and age data for refugees less than 18 years old in Niger. The tables show data for both males and females of the same age interval. The upper table has an identical spacing between each column and the table is perceived as 7 columns of data excluding the row headers. The bottom table draws together the male and female columns in order to relate them, and separates the age interval values. This creates the perception of only 3 groups of data, each of which can be sub-processed in terms of the Female and the Male group.

This natural grouping of similar information reduces the need to process the table as a whole – breaking it up into more manageable and easily processed chunks.

**Table 25 Sex And Age Data For Refugees Less Than 18 Years Old, Niger, 2012**

**DON'T**

<b>Camps / Sites</b>	<b>F 0-4</b>	<b>M 0-4</b>	<b>F 5-11</b>	<b>M 5-11</b>	<b>F 12-17</b>	<b>M 12-17</b>	<b>Grand Total</b>
Gaoudel	157	129	260	212	86	75	919
Intadabdab	42	35	51	36	22	19	205
Mbeidoun	43	38	48	42	16	15	202
Tabareybarey	926	914	1,581	1,291	291	219	5,222
Tidirgalene	11	15	15	5	5	4	55
Tinfagate	64	54	108	127	31	21	405
<b>Total</b>	<b>1,243</b>	<b>1,185</b>	<b>2,063</b>	<b>1,713</b>	<b>451</b>	<b>353</b>	<b>7,008</b>

**DO**

<b>Camps / Sites</b>	0-4 years old		5-11 years old		12-17 years old		<b>Grand Total</b>
	<b>F</b>	<b>M</b>	<b>F</b>	<b>M</b>	<b>F</b>	<b>M</b>	
Gaoudel	157	129	260	212	86	75	919
Intadabdab	42	35	51	36	22	19	205
Mbeidoun	43	38	48	42	16	15	202
Tabareybarey	926	914	1,581	1,291	291	219	5,222
Tidirgalene	11	15	15	5	5	4	55
Tinfagate	64	54	108	127	31	21	405
<b>Total</b>	<b>1,243</b>	<b>1,185</b>	<b>2,063</b>	<b>1,713</b>	<b>451</b>	<b>353</b>	<b>7,008</b>

\* F= Female \* M= Male

### 5.15 Make effective use of the grid

Effective use of the grid is a higher level goal which also covers some of the previous rules such as removing clutter, and using high contrast between figure and ground.

A large table using grid lines or alternating gray to separate each entry can be very daunting. The busy grid lines distract the reader from the data (table 26).

Since the eye is better able to quickly scan up and down columns, it is the rows which benefit most from shaded rows or guiding lines. For this reason, vertical shaded columns and vertical lines serve to break up any horizontal connectedness and are best avoided.

In a small table, alternating gray background or grid lines for every entry is unnecessary. The eyes can easily follow the numbers across the table without them. A narrow table with two columns of numbers does not require any guides.

Effective use of the grid does not mean the grid has to be drawn. If the data itself defines the grid, then the absence of grid lines is more effective than their presence.

Use strong grid lines only when the information is complex. To draw the eye across the row, avoid vertical column lines or keep them subdued and use alternate bands of quiet colour across rows to improve legibility.

#### DON'T

Table 26 Food Security Status, Niger, 2012

Departement	Severe	Moderate	At risk	Secure
Diffa	10'775	64'168	44'390	97'752
Mainé-soroa	18'067	60'110	59'983	66'800
Nguigmi	2'129	32'237	23'254	70'424
Dosso	5'806	126'931	128'500	145'268
Boboye	16'327	60'631	73'904	222'935
Doutchi	28'458	143'536	201'386	309'385
Gaya	3'455	60'969	81'374	204'660

#### DON'T

Departement	Severe	Moderate	At risk	Secure
Diffa	10'775	64'168	44'390	97'752
Mainé-soroa	18'067	60'110	59'983	66'800
Nguigmi	2'129	32'237	23'254	70'424
Dosso	5'806	126'931	128'500	145'268
Boboye	16'327	60'631	73'904	222'935
Doutchi	28'458	143'536	201'386	309'385
Gaya	3'455	60'969	81'374	204'660

#### DO

Departement	Severe	Moderate	At risk	Secure
Diffa	10'775	64'168	44'390	97'752
Mainé-soroa	18'067	60'110	59'983	66'800
Nguigmi	2'129	32'237	23'254	70'424
Dosso	5'806	126'931	128'500	145'268
Boboye	16'327	60'631	73'904	222'935
Doutchi	28'458	143'536	201'386	309'385
Gaya	3'455	60'969	81'374	204'660
Loga	19'194	69'149	48'891	63'897

**DO**

Use the grid to guide the eye in the appropriate direction and to improve legibility. For an unobtrusive look, hide grid lines or display them as a subtle element.

Use thin rules after every three to five entries to help the reader follow the numbers across a table.

However, a wide table needs a rule every three lines.

Shading can be used to highlight a column of data or an entry.

<b>Departement</b>	<b>Severe</b>	<b>Moderate</b>	<b>At risk</b>	<b>Secure</b>
Abalak	5'922	33'305	26'889	46'007
Aguié	25'489	73'448	125'772	160'519
Boboye	16'327	60'631	73'904	222'935
Bouza	54'931	135'553	108'422	103'785
Dakoro	25'596	78'271	123'999	377'910
Diffa	10'775	64'168	44'390	97'752
Dosso	5'806	126'931	128'500	145'268
Doutchi	28'458	143'536	201'386	309'385
Filingué	53'069	173'395	185'592	143'516
Gaya	3'455	60'969	81'374	204'660
Guidan	17'791	117'206	121'506	248'034
Illéla	56'821	86'007	118'882	105'378
Keita	32'238	90'952	110'961	68'810
Kollo	37'002	143'247	126'239	138'224
Konni	28'347	63'054	144'243	269'508
Loga	19'194	69'149	48'891	63'897
Madaoua	4'701	136'736	41'903	261'357
Madar ounfa	21'162	62'901	86'946	236'148
Mainé-soroa	18'067	60'110	59'983	66'800
Mayahi	63'127	155'510	148'856	179'634
Nguigmi	2'129	32'237	23'254	70'424
Ouallam	50'402	105'894	104'728	124'606
Say	2'381	30'262	49'992	235'395
Tahoua	37'366	101'469	97'790	140'704
Tchintaba	6'051	18'045	33'071	67'110
Téra	50'373	188'402	132'937	210'418
Tessaoua	42'974	132'615	138'408	165'889

### 5.16 Provide a brief verbal commentary

If a subject matter expert is handy (or if you are the expert), provide one or two sentences to explain the main message of the table. This will facilitate the reader’s understanding of the data.

For example, in the case of the Niger sex and age data for less than 18 years old refugees, the message in italic has been inserted between the title and the table, as shown in the table 27 below.

In this case it is the comparison that is important, not the specific values. The text above allows the user to ensure that they have viewed the table and extracted the general information that was intended by the creator. The reader may then be interested to additionally see the min and max values throughout the sites although this was not part of the underlying message.

Accompanying text helps clarify and strengthen the message and boosts user confidence that there is no further important detail ‘hidden’ in the table which should have been extracted.

**Table 27 Sex And Age Data For Refugees Less Than 18 Years Old, Niger, 2012**

*Across sites, the proportion male/female is generally respected with slightly more female than men in each. Tabareybarey site alone account for more than twice the total of all other sites combined. In this site, the segment 0-11 years old is abnormally over represented.*

Camps / Sites	0 – 4 years old		5 – 11 years old		12 – 17 years old		Grand Total
	F	M	F	M	F	M	
Gaoudel	157	129	260	212	86	75	919
Intadabdab	42	35	51	36	22	19	205
Mbeidoun	43	38	48	42	16	15	202
Tabareybarey	926	914	1,581	1,291	291	219	5,222
Tidirgalene	11	15	15	5	5	4	55
Tinfagate	64	54	108	127	31	21	405
Total	1,243	1,185	2,063	1,713	451	353	7,008

### 5.17 White space is not your enemy

Use white space between rows and columns, around headings, titles, labels and explanations. White space makes a table easier to read, clarify and organise it better.

Using what are known as the ‘gestalt laws’ of closure, proximity, symmetry, continuity, we can use white space and simple alignment to make the appearance of the data table more appealing and more easily processed by the reader without trying to force grouping, connectedness (or lack thereof) by using lines, boxes, borders and other elements that become clutter – upsetting the figure and ground relationship.

For example, in table 28, the removal of all lines and shaded rows, and the absence of any bold or differently represented text combined with reduced white space around some elements to promote connectedness and increased whitespace between other areas to separate groups and differentiate headings, allows the table to really work quite well with absolutely no decoration needed whatsoever. The white space does the job for us.

In this instance, where white space is the defining tool, it would be important to leave a further significant whitespace between the table itself and any surrounding text.

**Table 28 Price Evolution (CFA) Niger, Comparison January-March 1994-1995**

Market	January		February		March	
	1994	1995	1994	1995	1994	1995
Birni N'Konni	51,250	50,500	59,400	68,200	60,000	61,000
Bouza	40,000	40,000	46,000	70,000	77,500	35,000
Illéla	49,000	65,000	57,700	57,500	54,500	71,500
Keïta	40,000	57,000	70,000	50,000	52,000	38,250
Madaoua	43,000	45,000	53,700	45,500	52,750	50,000
Filingué	46,750	59,267	56,560	73,281	68,166	58,722
Kollo	50,000	60,000	55,000	43,000	54,000	56,000
Say	33,445	77,500	42,300	40,880	31,000	52,575
Téra/Gotheye	51,400	42,250	70,665	68,750	65,250	66,000

### 5.18 Use meaningful labels and manage headings

Labels are your opportunity to improve comprehension. Think through how the table will be used and the audience’s familiarity with the content and choose labels accordingly.

In order not to break the readers processing of the data, it is important not to interrupt that process by virtue of not making the labels easily understood.

The headers and labels play an extremely important part in putting the data into context. For example in the left table 29 below, even assuming the reader can work out that the data relates to weather variations, the user may have questions about whether the values are averaged over many years, and what the units are – a critical feature of any table providing technical data, not to mention where the measurements took place.

The right table 29, however, does a much better job of specifying the context through appropriate labels, headings, units and also showing that titles and illustration labels also play a part in further contextualizing the data.

Be sure to appropriately balance the information presented according to the likely needs of the reader and avoid abbreviations. To avoid using little known abbreviations and acronyms that readers won’t understand, you may have to work your headings into table notes. Consider spreading them over two or three lines or include heading detail in a footnote.

**Table 29 Weather Variation, London UK, 2010**

**DON'T**

	T		H		P	
	L	H	L	H	L	H
J	-6.0	8.8	60	100	986	1044
F	-2.8	10.9	48	100	973	1025
M	-5.6	17.7	34	100	976	1037
A	-1.2	22.2	27	100	996	1036
M	-0.8	27.8	25	100	1003	1034
J	5.2	29.1	26	100	998	1030
J	9.8	30.6	23	99	997	1027
A	5.6	26.1	31	100	992	1029
S	5.2	24.8	35	100	998	1028
O	-0.4	21.3	42	100	990	1031
N	-7.6	17.3	55	100	963	1023
D	-10.4	9.2	53	100	987	1039

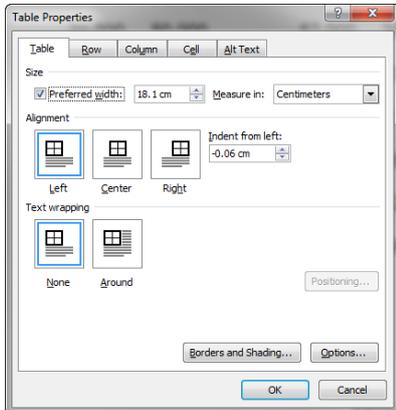
**DO**

Month	Temperature (C)		Humidity (%)		Pressure (mbar)	
	Min	Max	Min	Max	Min	Max
Jan	-6.0	8.8	60	100	986	1044
Feb	-2.8	10.9	48	100	973	1025
Mar	-5.6	17.7	34	100	976	1037
Apr	-1.2	22.2	27	100	996	1036
May	-0.8	27.8	25	100	1003	1034
Jun	5.2	29.1	26	100	998	1030
Jul	9.8	30.6	23	99	997	1027
Aug	5.6	26.1	31	100	992	1029
Sep	5.2	24.8	35	100	998	1028
Oct	-0.4	21.3	42	100	990	1031
Nov	-7.6	17.3	55	100	963	1023
Dec	-10.4	9.2	53	100	987	1039

\* Average temperature, humidity level and pressure measured in 12 weather stations located in London city  
 C = Celsius centigrade. Fahrenheit = Celsius X 9/5 + 32  
 mbar = Millibar

### 5.19 Table formatting with Office Word

Most of us create tables using the standard package Microsoft office word. The Table Properties dialog box is extremely useful and is used to control a large number of different table options. This dialog box can be used to control the exact position of the table on the page, the height and width of individual rows and columns, the default cell margins and any text wrapping and header rows.



**Size:** Specifies the *preferred* width of the entire table. By default new tables fill up the page from the left to the right margin. (This setting may be overridden by content and other property settings.)

**Alignment:** Positions the table relative to the margins of the page. This does not affect alignment of text within cells.

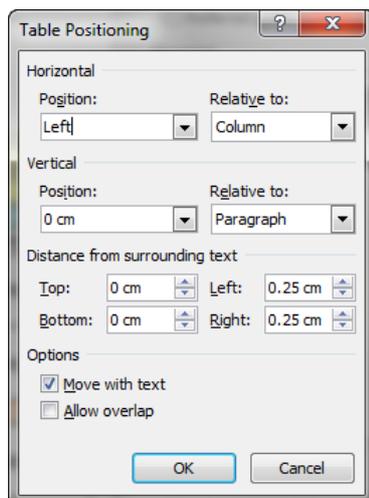
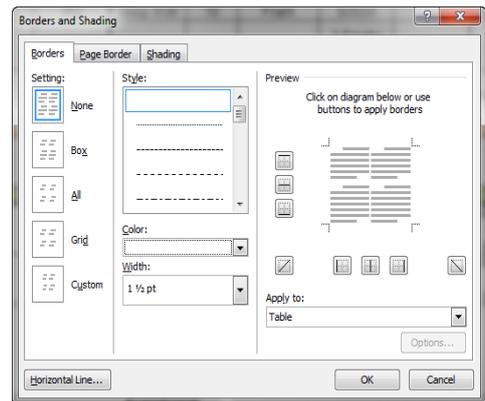
**Text Wrapping:** Can allow surrounding text to wrap around the table. The Positioning button will control position of the table relative to the text.

**Borders and Shading:** Performs the same function as the Borders and Shading Command in the Format menu.

**Manually apply shading and borders:** If you want to add a little colour or definition to a table, *Borders and Shading* are the way to go.



Although the “Tables and Borders” toolbar offers a palette of border placement options and lets you “draw” borders of various formats, the “Borders and Shading” dialog box is probably a little less confusing to use and offers more options.



**Add space around the table:** Once you've dragged a table to a good spot on the page (“good” means the table isn't throwing things off balance by hanging awkwardly into a margin, sitting too high or low, or creating any funky line breaks in the text), you can polish it up by adding some space around it. A little breathing room will enhance readability and reduce that crowded look.

In the Table Properties dialog box, in the Table tab, you'll see that the “Around” option is selected under Alignment. Click “Positioning” to access the options shown in the attached picture. Microsoft Office Word is already providing a little space to the left and right of the table (0.25 cm), but you can increase or decrease that amount if you want. It is recommended to use 0.7-1 cm to have an optimal effect. You can also use the Top and Bottom options to add space above and below your table.

## 5.20 Other use of tables

This section presents two examples of alternative use of table: agenda and timetable.

**Table 30 Sample Agenda Template**

### Introduction to Data Visualization tools, XX/XX/XXXX

Timing	Description
9:30 – 9:45	Introduction
9:45 – 10:00	Demo – Earthquake data
10:00- 11:00	Exercise – Niger Food Insecurity <i>Creating tables, Bar charts, maps, stacked bars and dashboard with tableau</i>
11:00 – 11:15	Coffee break – Book review
11:15 – 11:30	Demo – Time series – Niger Cow prices
11:30 – 12:00	Exercise – Niger Sorgho prices <i>Creating time series and area charts</i>
12:00 – 12:15	Working with qualitative data – Libya DNU
12:15 – 12:45	Exercise – ACAPS Rubik cube <i>Manipulating and representing severity ranking</i>
12:45 – 13:00	Lunch break
13:00 – 14:00	Exercise – Yemen Rubik cube <i>Dashboard design principles and practice</i>

#### Additional information

- 1 Computer needed per participants – Wifi ACAPS: XXXXXXXX
- Location ACAPS office XXXXXX
- Pre readings and instructions for preparing to the session are attached next page

Table 31 Crop Calendar And Significant Other Events, Comoros, 2010

Activity or Factor	J	F	M	A	M	J	J	A	S	O	N	D	
<i>Climate</i>													
Rainy Season	█		█							█			
Dry Season			█										
<i>Production of Staple Crops</i>													
Taro: Land preparation and planting				█									
Taro: Harvest										█			
Highest yields of cassava and banana										█			
Highest yields of coconut.										█			
Mango harvest	█												
Breadfruit harvest												█	
<i>Production of Commercial Crops</i>													
Vanilla: Planting/germination		█											
Vanilla: harvest										█			
<i>Illness</i>													
Period when illness (malaria mentioned) more prevalent.			█										
<i>HH Expenditures</i>													
Contributions to marriage celebrations							█						
School fees and related costs										█			
<i>Food Security</i>													
Food shortage (one meal per day)	█										█		
Food most abundant (at least two meals, variety, protein)							█						

Team Notes: The family said that harvest of crops like cassava, banana and coconut is spread throughout the year. It was also noted that all crops are liable to be sold, for the purchase of rice, fish and other items.

## 6. Checklist for creating effective tables

Topic	Instructions
Overall principles	<ul style="list-style-type: none"> <li>• Use consistent formatting, alignment, title, headings format and symbols in all tables in a document</li> <li>• Check your table can be understood without reference to the text</li> <li>• Decide on a reasonable amount of data to be represented, not too little so that the reader does not understand your results, but not too much so that the reader is overwhelmed and confused. Limit your table to data that are relevant to your hypothesis</li> <li>• Only include the necessary number of tables in your paper, otherwise, it may be redundant or confusing to the reader</li> <li>• Do not use tables if you only have two or fewer columns and rows. In such cases, a textual description is enough</li> <li>• Organize your tables neatly so that the meaning of the table is obvious at first glance. If the reader spends too much time deciphering your table, then it is too complicated and not efficient</li> <li>• Remember that too many rows or columns could make it difficult for the reader to understand the data. You may need to reduce the amount of data, or separate the data into additional tables</li> <li>• If you have identical columns or rows of data in two or more tables, combine the tables</li> </ul>
Title	<ul style="list-style-type: none"> <li>• Write an individualized and clear title for each table</li> <li>• State the purpose or topic of that table</li> <li>• Include the context of the data (the W's: Who, What, When, etc.)</li> <li>• Identify units of measurement, if the same for all or most variables in the table</li> </ul>
Table notes	<ul style="list-style-type: none"> <li>• Identify the data source (if not in table title)</li> <li>• Define all abbreviations and symbols used within the table</li> </ul>
Delineating columns and rows	<ul style="list-style-type: none"> <li>• Use white space alone whenever space allows</li> <li>• When you can't use white space, use subtle fill colours</li> <li>• When you can't use fill colour, use subtle rules</li> <li>• Avoid grids altogether</li> <li>• Leave line gaps after every four or five rows in a large table</li> </ul>
Arranging data	<p><i>Columns or rows</i></p> <ul style="list-style-type: none"> <li>• Arrange a set of categorical subdivisions across separate columns if they are few in number and the maximum numbers of characters in those subdivisions is not too large</li> <li>• Arrange time-series subdivisions horizontally across separate columns</li> <li>• Arrange ranked subdivisions vertically down the rows</li> <li>• Coordinate row and column sequence with order of discussion for text tables</li> </ul> <p><i>Groups and breaks</i></p> <ul style="list-style-type: none"> <li>• Use just enough vertical white space between groups to make breaks noticeable</li> <li>• Repeat column headers at the beginning of each new group</li> <li>• Keep table structure consistent from group to group</li> <li>• When groups should be examined independently, start each on a new page</li> <li>• Use indenting or column spanners to show how adjacent rows or columns relate</li> <li>• Make appropriate use of horizontal lines. Lines between rows are unnecessary, but lines below column headings and at the foot of the table add neatness</li> </ul>

Topic	Instructions
	<p><i>Label</i></p> <ul style="list-style-type: none"> <li>• Label each row and column clearly, briefly identify its contents</li> <li>• Specify units of measurement or coding if not summarized in table title</li> <li>• Always give units of measurement in table headings</li> </ul> <p><i>Column sequence</i></p> <ul style="list-style-type: none"> <li>• Place sets of categorical subdivisions that are arranged down the rows of a single column to the left of the quantitative values associated with them</li> <li>• Place sets of categorical subdivisions that have a hierarchical relationship from left to right to reflect that hierarchy</li> <li>• Place quantitative values that were calculated from another set of quantitative values just to the right of the column from which they were derived</li> <li>• Place columns containing data that should be compared close together</li> </ul> <p><i>Value sequence</i></p> <ul style="list-style-type: none"> <li>• Whenever categorical subdivisions have a meaningful order, sort them in that order</li> <li>• Use appropriate ordering for data or categories. Common orderings include chronological (earliest first), alphabetical, geographical, order of size of data value, or some other logical grouping that readers will recognise</li> <li>• If your table compares data on two axes (e.g. area vs time), it is the comparison your readers are likely to be most interested in that should read downwards</li> </ul>
<p>Formatting text</p>	<p><i>Orientation and alignment</i></p> <ul style="list-style-type: none"> <li>• Avoid text orientations other than horizontal, left to right</li> <li>• Align numbers to the right, keeping the decimal aligned as well</li> <li>• Align dates to the left using a format that maintains a constant width</li> <li>• Align all other text to the left</li> <li>• Centre non-numeric data if they all have the same numbers of characters and the header is significantly greater</li> </ul> <p><i>Number and date formatting</i></p> <ul style="list-style-type: none"> <li>• Place a comma to the left of every three whole-number digits</li> <li>• When negative numbers are enclosed in parentheses, keep the negative numbers themselves right aligned with the positive numbers</li> <li>• Place a percentage sign immediately to the right of every percentage value</li> <li>• Truncate the display of whole numbers by sets of three digits whenever numeric precision can be reduced to the nearest thousand, million, billion, etc.</li> <li>• Express months either as a two-digit number or a three character word</li> <li>• Express days and months as two digits</li> </ul> <p><i>Number precision</i></p> <ul style="list-style-type: none"> <li>• Report the fewest number of digits and decimal places needed for your topic, data, and types of statistics. Do not exceed the required level of precision</li> <li>• Round numbers as much as possible. Try to round to two decimal places unless more decimals are needed</li> </ul> <p><i>Font , emphasis and colour</i></p> <ul style="list-style-type: none"> <li>• Select a font that is legible, and use the same font throughout the table</li> <li>• Boldface, italicize, or change the colour of fonts when useful to group or to highlight</li> </ul>

Topic	Instructions
Summarising values	<ul style="list-style-type: none"> <li>• Provide column/row totals or other numerical summaries that can make it easier to understand the data</li> <li>• Make columns containing group summaries visually distinct from details columns</li> <li>• Place totals (if included) at right and bottom, not left and top. If this rule is broken – e.g. because the table is large and you feel that users would most usefully see the totals first – you should make it very clear which values are totals</li> <li>• Place summaries in the group header if its rows extend down multiple pages</li> </ul>
Giving page information	<ul style="list-style-type: none"> <li>• Repeat column headers at the top of each page</li> <li>• Repeat current row headers at the top of each page</li> </ul>
Description text	<ul style="list-style-type: none"> <li>• Make sure that your table is supplementary to your text and does not replicate it</li> <li>• Refer to all tables by numbers in your text, e.g., Table 1, 2, 3...</li> <li>• Describe or discuss only the table's highlights in your text</li> <li>• Unless using a specific format style that requires that you place tables separately at the end of the report, place the tables near the text that refers to them</li> </ul>

## 7. References

*This technical brief was inspired by the work of Stephen Few, Jane E. Miller, Connie Malamed, Roger Atrill and Dona M. Wong. We strongly recommend referring to their excellent work on graph and table design. Stephen Few provides a three day workshop on data visualization which is a must-do for any person interested in learning more about efficient data exploration, visualization and communication.*

Show Me the Numbers, Stephen Few, 2006

The visual display of quantitative information, 2<sup>nd</sup> Edition, Edward Tufte, 2001

The Wall Street Journal: Guide to Information Graphics, Dona M. Wong, 2010

White space is not your enemy, Kim Golombisky & Rebecca Hagen, 2010

The Chicago Guide on writing about numbers, Jane E. Miller, 2004

10 easy ways to turn a dull Word table into a design element

<http://www.techrepublic.com/article/10-easy-ways-to-turn-a-dull-word-table-into-a-design-element/6047632>

Guidelines for Designing <http://understandinggraphics.com/design/data-table-design>

Graphing Resources: Designing Tables <http://www.ncsu.edu/labwrite/res/gh/gh-tables.html>

Constructing Good tables <http://lilt.ilstu.edu/gmclass/pos138/datadisply/sections/goodtables.html>

Guidelines for Tables and Figures, Kirsten A. Gronbjerg, 2002

<http://www.thinkui.co.uk/resources/effective-design-of-data-tables/>

Effective design of data tables, <http://www.thinkui.co.uk/resources/effective-design-of-data-tables/>