Making Sense of Statistics for Family Practitioners

"Setting the Table"

After good quality data is collected either through a routine surveillance system, survey, or clinical research it is important that this data is analysed and presented in a way that can lead to improved patient management or public health action. A table is simply a standard way of arranging a set of data into rows and columns and a good starting point for preparing powerful visual displays of data, such as graphs and charts, where some of the detail of the data may be lost. If the amount of data is small and relationships are simple, a table may be all that is needed. Therefore, in preparing tables, it is important to keep in mind that their primary purpose is to *"communicate"* information about the data and that, almost any quantitative information can be organised into tables.

There are two golden rules that govern the preparation of a table namely:

- It must be as *"simple as possible"* and
- It must be able to *"stand-alone"*.

Compliance with the first rule ensures that the data is communicated unambiguously. It is always preferable to have two or three small tables each focusing on a different aspect of the data, than a single large table that contains many details or variables. Care in observing the "stand-alone rule" guarantees that when a table is taken out of its original context, which often happens, it will still convey all the information necessary for the reader to understand the data. There are a number of features that a good table must demonstrate and these include the following:

- A clear concise title that describes the *"what, where, and when"* of the data in the table and this should be preceded by the table number.
- Each row and each column should be clearly labelled and include the units of measurement.
- Totals for rows and columns should be shown and, if percentages are given, their totals should add up to 100%.
- Always note any exclusions, e.g. cases lost to follow-up, in a footnote.
- Always explain any codes, abbreviations, or symbols used in the table in a footnote.
- If the data are not original, note their source in the footnote.

The most basic table is a simple frequency distribution with only one variable. Table I summarises the use of malaria chemoprophylaxis among 7310 overnight visitors to the Kruger National Park, South Africa during April 1996.[1] In this form of table, the first column lists the values or categories of the variable represented by the data, i.e. various chemoprophylactic regimens. The second column indicates the number of persons or events that fall into each category. Often, a third column provides the percentage of persons or events in each category, as in this example. Although the percentages may add up to a little above or below 100% due to rounding to one decimal place, the total is usually given as 100%. A footnote explaining that the difference is due to rounding can be included.

Table I: ***Use of malaria chemoprophylaxis among overnight visitors to the Kruger National Park, South Africa during April 1996***

Regimen	No.	%
None	1391	19.0
Chloroquine + proguanil	2605	35.6
Mefloquine	1347	18.4
Chloroquine alone	1150	15.7
Proguanil alone	253	3.5
Chloroquine + chloroquine*	99	1.4
Doxycycline	67	0.9
Pyrimethamine + dapsone	43	0.6
Homeopathic products	43	0.6
Pyrimethamine and chloroquine	33	0.5
Chloroquine, chloroquine + proguanil†	33	0.5
Mefloquine + chloroquine	29	0.4
Unsure	127	1.7
Other¥	90	1.2
TOTAL	7310	100

* Prophylaxis consisted of two different commercial brands of chloroquine

† Prophylaxis consisted of two different commercial brands of chloroquine plus proguanil

¥A range of commercially available products not known to have any activity against *Plasmodium spp*

Source: Durrheim DN, Gammon S, Waner S, Braack LE. Antimalarial prophylaxis—use and adverse events in visitors to the Kruger National Park. S Afr Med J 1999; 89: 170-175.

Data can also be cross-tabulated to show counts by a second variable. Table II shows immunisation coverage with the various Expanded Programme on Immunisation antigens in

Table II: ***Immunisation coverage (%) with EPI antigens - children aged 12-23 months, Mpumalanga Province, 1997***

	BCG	DPT1	DPT2	DPT3	HepB1	HepB2	HepB3	OPV1	OPV2	OPV3	Measles
Barberton	86 (100)	83 (100)	83 (100)	83 (100)	83 (100)	83 (100)	83 (100)	83 (100)	83 (100)	83 (100)	82 (97)
Bethal	91 (99)	87 (99)	86 (96)	86 (95)	86 (96)	86 (95)	84 (93)	86 (97)	86 (95)	86 (94)	73 (91)
Delmas	63 (100)	57 (96)	57 (95)	56 (93)	57 (95)	57 (94)	56 (93)	58 (95)	57 (94)	56 (93)	52 (87)
Eerstehoek	91 (100)	94 (100)	93 (100)	92 (99)	94 (100)	93 (99)	91 (98)	94 (100)	94 (100)	92 (99)	88 (94)
Ermelo	81 (94)	74 (85)	67 (77)	60 (69)	73 (83)	67 (77)	59 (69)	74 (85)	67 (77)	60 (69)	51 (60)
Groblersdal	79 (96)	66 (94)	64 (92)	60 (90)	56 (86)	54 (83)	50 (79)	67 (94)	65 (92)	58 (87)	57 (80)
Highveld Ridge	96 (98)	96 (98)	95 (97)	92 (94)	95 (97)	93 (95)	90 (92)	96 (98)	95 (97)	92 (94)	87 (98)
Kabokweni	96 (100)	95 (100)	95 (100)	90 (97)	95 (100)	95 (100)	90 (100)	95 (100)	95 (100)	90 (97)	87 (91)
KwaMhlanga	81 (100)	81 (99)	80 (98)	80 (97)	77 (89)	69 (81)	62 (71)	81 (99)	80 (98)	80 (97)	72 (90)
Lydenburg	51 (77)	56 (76)	48 (64)	40 (52)	48 (62)	43 (55)	33 (43)	56 (74)	48 (64)	39 (51)	29 (40)
Middelburg	84 (95)	83 (96)	82 (95)	82 (94)	83 (95)	82 (94)	82 (94)	82 (95)	82 (94)	82 (93)	73 (86)
Mmamethlake	99 (99)	98 (99)	96 (97)	91 (91)	79 (80)	63 (64)	51 (51)	97 (97)	93 (94)	88 (89)	76 (76)
Nelspruit	94 (100)	87 (99)	86 (97)	86 (96)	87 (99)	86 (97)	86 (96)	87 (99)	86 (97)	86 (96)	72 (83)
Philadelphia	96 (96)	96 (97)	90 (90)	86 (83)	90 (90)	86 (86)	86 (86)	90 (90)	90 (90)	83 (84)	84 (87)
Piet Retief	65 (91)	65 (91)	59 (83)	56 (73)	65 (91	59 (83)	56 (73)	65 (91)	59 (83)	56 (73)	50 (65)
Sabie	78 (99)	77 (95)	76 (94)	74 (93)	76 (94)	75 (94)	73 (92)	76 (95)	76 (94)	74 (93)	63 (81)
Shongwe	94 (99)	93 (98)	93 (98)	93 (97)	93 (98)	93 (97)	93 (97)	93 (97)	93 (97)	93 (97)	82 (85)
Standerton	96 (100)	87 (100)	83 (98)	82 (100)	86 (100)	83 (98)	82 (99)	87 (100)	84 (98)	82 (100)	84 (93)
Tonga	100 (100)	97 (97)	97 (97)	94 (94)	97 (97)	97 (97)	94 (94)	98 (98)	97 (97)	95 (95)	87 (87)
Volksrust	71 (99)	71 (99)	67 (93)	63 (87)	67 (93)	59 (84)	54 (77)	71 (99)	67 (93)	63 (87)	57 (79)
Witbank	75 (97)	75 (100)	75 (99)	75 (99)	75 (99)	75 (99)	75 (99)	75 (99)	75 (99)	75 (99)	68 (91)
PROVINCE	85 (97)	83 (96)	81 (94)	78 (91)	81 (93)	77 (90)	74 (86)	83 (96)	81 (94)	78 (90)	72 (83)

Note: numbers in parenthesis ( ) are % coverage by date recorded in card plus history 1,2,3 = number of dose
BCG = Bacillus Calmette Guerin; DPT = diphtheria, pertussis, tetanus vaccine; Hep B = Hepatitis B vaccine; OPV = oral polio vaccine
Source: Durrheim DN, Ogunbanjo GA. Measles elimination – is it achievable? Lessons from an immunisation coverage survey. S Afr Med J 2000; 90: 130-135

Mpumalanga Province districts, during 1997.[2] This table captures an enormous amount of data and allows for comparisons between districts and by antigens within districts.

Two-variable tables are sometimes known as *"contingency"* tables. The simplest form of contingency table is a *"two-by-two"* table because each of the two variables has two categories (see Table III). Two by two tables are used for calculating measures of association and performing tests of statistical significance such as the chi-square test, topics which will be covered later in our series.

Sometimes, a third variable may be included in a table to display a set of data more completely. However, a three-variable table is rather busy and certainly is the maximum amount of complexity you should attempt to include in a single table. In summary, the primary purpose of tables in articles is to communicate information about the data and if you follow the features of a good table described above, you should be able to present tables in a user-friendly and understandable manner to colleagues. In addition, the next time you read any article with tables, check for those important features that make a table - a "good" table.

Table III: ***Exposure to Borehole A among cases of diarrrhoea and neighbourhood controls in KwaZanele, Mpumalanga, April 1996***

		Cases	Controls	Total
Water from Borehole A	Yes	25	28	53
	No	2	26	28
	Total	27	54	81

REFERENCES

1 Durrheim DN, Gammon S, Waner S, Braack LE. Antimalarial prophylaxis—use and adverse events in visitors to the Kruger National Park. S Afr Med J 1999; 89: 170-175.

2 Durrheim DN, Ogunbanjo GA. Measles elimination – is it achievable? Lessons from an immunisation coverage survey. S Afr Med J 2000; 90: 130-135.

David N. Durrheim MBChB, DTM&H, DCH, FACTM, MPH &TM, MACTM
Associate Professor, School of Public Health and Tropical Medicine, James Cook University Australia & Consultant: Communicable Disease Control, Department of Health, Mpumalanga.

Gboyega A. Ogunbanjo MBBS, MFGP (SA), M Fam Med (MEDUNSA)
Associate Professor, School of Public Health and Tropical Medicine, James Cook University Australia & Principal Family Physician & Senior Lecturer, Department of Family Medicine and Primary Health Care, Medunsa.