

# Contents

<b>List of figures</b>	vii
<b>Introduction</b>	ix
<b>Symbols and abbreviations used in the text</b>	xi

<b>Part 1</b>	<b>Welcome to statistics</b>	1
---------------	------------------------------	---

<b>1 Why bother with statistics?</b>	3
Its scope and the need for an awareness of its value in library and information work.	
<b>2 Elements of statistics</b>	8
Types of variable. Levels of measurement. Fundamental terminology and concepts. A maths refresher.	

<b>Part 2</b>	<b>Descriptive statistics</b>	17
---------------	-------------------------------	----

<b>3 Percentages, proportions and ratios</b>	19
<b>4 Organizing data</b>	24
Tables. Graphing.	
<b>5 Measures of central tendency</b>	33
Arithmetic mode, median, mean. Comparison, uses. Single and grouped data. Frequency distributions. Cumulative frequencies. Class intervals, class boundaries, midpoints.	
<b>6 Measures of dispersion</b>	44
Range. Quartiles, the standard deviation.	
<b>7 Time series, index numbers</b>	53

<b>Part 3</b>	<b>Probability</b>	63
---------------	--------------------	----

<b>8 Introducing inferential statistics and probability</b>	65
<b>9 The binomial distribution</b>	75
<b>10 Sampling</b>	83

<b>Part 4</b>	<b>Inference</b>	93
---------------	------------------	----

<b>11 Inference from sample to population</b>	95
Standard Normal Distribution and $t$ -distribution. Confidential intervals. The Central Limit Theorem.	

<b>12</b>	<b>Introduction to hypothesis testing</b>	104
	Principles. Significance testing for a single mean.	
<b>13</b>	<b>Two-means tests</b>	114
<b>14</b>	<b>Proportions</b>	120
	Confidence intervals and significance tests.	
<b>15</b>	<b>Bivariate statistics</b>	126
	Association of two variables. Yule's $Q$ . $\chi^2$	
<b>16</b>	<b>Correlation and regression</b>	135
	<b>Conclusion</b>	149
	<b>Appendices</b>	
<b>1</b>	<b>Answers to practice questions</b>	151
<b>2</b>	<b>Statistical tables and formulae</b>	162
<b>3</b>	<b>Bibliography</b>	170
	<b>Index</b>	173

# List of figures

1.1	Increase in sales completed, Agent Brown	7
1.2	Sales for Agent Brown 1994	7
4.1	Elements required for a simple bar chart	29
4.2	Staffing establishments, Newtown and City Libraries – simple bar chart	29
4.3	Staffing establishments, Newtown and City Libraries – compound bar chart	30
4.4	Staffing establishments, Newtown and City Libraries – component bar chart	31
4.5	Staffing establishment, Newtown Library – pie chart	31
5.1	Frequency histogram	42
5.2	Plotting the polygon	43
6.1	Ogive	46
6.2	Standard deviation distribution	48
7.1	Three-year cycle of issues in graph form	56
7.2	Three-year cycle of issues – trend line	57
11.1	Standard normal distribution	98
11.2	Standard normal distribution and sampling distribution of the means	99
12.1	Sample means – populations A and B	108
12.2	Distribution of sample means where $\mu$ is 15	109
12.3	Comparison between $\mu$ when greater and lesser than 15	112
13.1	Distribution of differences between sample means	116
13.2	Sampling distributions y means y two populations	117
13.3	A test for the difference between two means	118
15.1	Distribution of $\chi^2$ from zero association	132
16.1	Scatter diagram showing unemployment and crime correlation	136
16.2	Variability of Y against values of X	137
16.3	Correlation between unemployment and crime figures	137
16.4	Scatter diagram showing Y and Y prime	144