Chapter 1.	Introduction	1
-	Statistics: Its Meaning, 1 Objectives in Studying Statistics, 1	•
Chapter 2.	Populations and Samples	4
	Reasons for Using Samples, 5 Sample Size, 6 Random Samples, 6 Other Types of Sample 6 Reasons for Using Random Samples, 7 Selection of a Random Sample, 8 Sampling with and without Replacement, 9 Tables of Random Numbers, 10 Selecting Samples When Lists Are Unavailable, 11 Samples of Convenience, 11	
Chapter 3.	Describing a Sample: Frequency Tables and Their Graphs	14
	The Array, 14 The Frequency Table, 16 Relative Frequency Tables, 19 Graphs, 21 Histograms—Equal Class Intervals, 21 The Histogram—Unequal Class Intervals, 23 Areas under the Histogram, 24 The Frequency Polygon, 24 Discrete and Continuous Scales, 25 Histograms with Small Class Intervals, 26 Distribution Curves, 26	
Chapter 4.	Describing a Sample: Measures of Location	30
	Parameters and Statistics, 30 The Arithmetic Mean, 30	
	[vii]	

	The Median, 31 Other Averages, 32 Mean and Median, 32 Computation of Mean from a Frequency Table, 33 Coding the Observations, 34 The Median from Tabulated Data, 35	
Chapter 5.	Describing a Sample: Measures of Variability	38
	Variability, 38 Measures of Variability, 39 Computing the Standard Deviation from a Frequency Table, 41 Computing Formulae for the Standard Deviation and the Variance, 42 Calculation of the Standard Deviation Using Coded Data, Standard Deviation and Variance of Data Measured on Different Scales, 45 Some Remarks on Calculations, 45 Sampling Properties of Mean and Variance, 46 Unbiasedness of the Sample Mean, 48 Unbiasedness of the Sample Variance, 48	44
Chapter 6.	The Normal Distribution	50
	Properties of the Normal Distribution, 50 Areas under the Normal Curve, 52 Interpreting Areas as Probabilities, 56 Importance of the Normal Distribution, 56	
Chapter 7.	Estimation of Population Means: Confidence Intervals  Estimating a Single Mean, 60  Confidence Intervals: An Example, 60  Definition of Confidence Interval, 62  Choice of Confidence Level, 62  Sample Size, 63	60
	The t Distribution, 63 Confidence Interval for the Mean, Using the t Distribution, 64 Estimating the Difference between Two Means: Unpaired Data, 65 The Distribution of $\overline{X}_1 - \overline{X}_2$ , 68	

	Confidence Intervals for $\mu_1 - \mu_2$ : Known Variance, 70 Confidence Intervals for $\mu_1 - \mu_2$ : Unknown Variance, 71 Summary, 72 Assigning Treatment at Random, 72 Estimating the Difference between Two Means: Paired Comparisons, 73 Paired versus Group Comparisons, 75	
Chapter 8.	Tests of Hypotheses on Population Means	81
	An Example of a Test, 81 One-Sided Tests, 86 Summary for Testing $H_0$ : $\mu = \mu_0$ When $\sigma$ Is Known, 86 Testing $H_0$ : $\mu = \mu_0$ When $\sigma$ Is Unknown, 87 Tests on the Differences between Two Means: Known Variances, 88 Summary for Testing $H_0$ : $\mu_1 = \mu_2$ When the Standard Deviations Are Known, 92 Testing Differences between Means: Unknown Variances, Testing Differences between Means: Paired Data, 94 Acceptance and Rejection, 95 One-Sided and Two-Sided Tests, 96 Two Kinds of Error, 97 An Illustration of $\beta$ , 97 $\alpha, \beta$ , Power, and Sample Size, 99 Confidence Intervals and Tests, 100 Summary Table, 101	93
Chapter 9.	Enumeration Data: Proportions  Proportions: Examples, 103 Samples from a Bead Box, 104 Use of the Normal Approximation, 107 Continuity Correction, 108 Confidence Intervals for a Population Proportion, 109 Confidence Intervals for the Difference between Two Population Proportions, 110 Tests of Hypotheses for a Population Proportion, 112 Testing the Difference between Two Proportions, 114 Summary, 115 Differences in Proportions from a Single Sample, 116	103

## Chapter 10. Enumeration Data: The Chi-Square Test

122

An Example, 122
Borderline Decisions, 126
Necessary Sample Size, 126
Tests of Association, 126
Goodness-of-Fit Tests, 128
Degrees of Freedom, 130
The Continuity Correction, 131
Remarks, 132

## Chapter 11. Variances: Estimation and Tests

136

Point Estimates for Variances and Standard Deviations, 136 Confidence Intervals for Variance and Standard Deviation Using a Single Sample, 137 Confidence Interval for Variance and Standard Deviation with More than One Sample, 139 Testing Whether Two Variances Are Equal, 140 Summary for Testing  $H_0$ :  $\sigma_1^2 = \sigma_2^2$ , 143

## Chapter 12. Regression and Correlation

146

The Scatter Diagram, 146 Linear Regression, 147 Plotting the Regression Line, 149 The Regression Coefficient, 150 The Meaning of the Least Squares Line, 150 The Variance around the Regression Line, 152 A Model Underlying Linear Regression, 153 Confidence Intervals in Linear Regression, 154 Correlation, 160 Calculation of the Coefficient of Correlation, 160 The Meaning of the Correlation Coefficient, 161 The Population Coefficient of Correlation, 163 Confidence Intervals for the Correlation Coefficient, 163 Tests of  $H_0: \rho = \rho_0$ , 164 Interpreting the Correlation Coefficient, 164

## Chapter 13. Demography and Vital Statistics

168

Rates and Ratios, 169 Mortality Rates, 169

Standardized Death Rates, 170

Index

Infant and Neonatal Mortality Rates, 173

		Rates, 173	
	Mor	bidity Statistics, 174	
Chapter 14	. Lij	fe Tables	178
		struction of a Life Table from Mortality Rates, 178 Abridged Life Table, 181	
	Life	Tables from Follow-Up Studies, 184	
Appendix			190
	<b>A.1</b>	Random Numbers, 190	
	A.2	Four-Place Squares of Numbers, 193	
	A.3	The Standard Normal Distribution, 195	
	A.4	Percentage Points $t[\lambda]$ of Student's $t$ Distribution, 19	9
	A.5	Percentage Points $\chi^2[\lambda]$ of the $\chi^2$ Distribution, 201	
	A.6	Percentage Points $F[\lambda]$ of the F Distribution, 202	
	<b>A.7</b>	Confidence Intervals for the Correlation Coefficient,	208
Answers to	Some	e of the Exercises	209

215