# **Contents**

Foreword	xiii
Preface	xv

## Part 1. Introduction

## Chapter 1 The Nature of Sampling Methods

1.1 Introduction.
1.2 The sampling procedure.
1.3 Sampling errors.
1.4 Response errors.
1.5 Attitude toward data collection.
1.6 Domain of sampling.
1.7 Characteristics of interest.
1.8 Census versus survey.
1.9 Sample survey in conjunction with census.
1.10 Dependability of sampling.
1.11 Judgment sampling.
1.12 Probability sampling.
1.13 Accuracy and precision.
1.14 The question of cost.
1.15 Sampling terminology.
References.

VIII	CON	TENTS
Chapter 2	Basic Principles of Sampling	13
	<ul> <li>2.1 Introduction.</li> <li>2.2 Sampling from a hypothetical population.</li> <li>2.3 The variance of sample estimates.</li> <li>2.4 Unequal probability sampling.</li> <li>2.5 Difference estimation.</li> <li>2.6 Ratio estimation.</li> <li>2.7 Stratification.</li> <li>2.8 Clustering.</li> <li>2.9 Double sampling.</li> <li>2.10 Nonsampling errors. Reference.</li> </ul>	
Part 2. Tea	chniques of Sampling	
Chapter 3	Methods of Sample Selection	31
	3.1 Introduction. 3.2 Simple random sampling. 3.3 Estimation based on simple random sampling. 3.4 Subpopulation analysis. 3.5 Stability of variance estimation. 3.6 Systematic sampling. 3.7 Estimation in systematic sampling. 3.8 Sampling with unequal probabilities. 3.9 Estimation in unequal probability sampling. Problems. References.	
Chapter 4	Use of Supplementary Information	50
	<ul> <li>4.1 Introduction.</li> <li>4.2 Stratification.</li> <li>4.3 Estimation from stratified samples.</li> <li>4.4 Ratio estimation.</li> <li>4.5 Ratio estimation in stratified sampling.</li> <li>4.6 Difference estimation.</li> <li>4.7 Regression estimation.</li> <li>Problems.</li> <li>References.</li> </ul>	
Chapter 5	Sampling in Clusters	68
	<b>5.1</b> Introduction. <b>5.2</b> Cluster sampling. <b>5.3</b> Multistage sampling. <b>5.4</b> Primary sampling units selected with replacement. <b>5.5</b> The self-weighting system. <b>5.6</b> The method of collapsed strata. Problems. Reference.	
Chapter 6	Double Sampling and Errors in Surveys	88
	<ul> <li>6.1 Double sampling.</li> <li>6.2 Sampling over several occasions.</li> <li>6.3 Some useful results.</li> <li>6.4 Nonsampling errors.</li> <li>6.5 Response errors.</li> <li>6.6 The role of interviewers.</li> <li>6.7 Gross and net errors.</li> <li>6.8 Control of response errors.</li> <li>6.9 The method of interpenetrating subsamples.</li> <li>6.10 Bias reduction by double sampling.</li> <li>6.11 The problem of nonresponse.</li> <li>6.12 Weighting by at-home probabilities.</li> <li>Problems. References.</li> </ul>	

CONTENTS

## Part 3. Planning and Execution of Surveys

## Chapter 7 Planning of Surveys: Initial Steps

111

7.1 Introduction.
7.2 Objectives of the survey.
7.3 The population to be studied.
7.4 The data to be collected.
7.5 Methods of collecting information.
7.6 Direct observation.
7.7 Mail questionnaires.
7.8 Interviewing.
7.9 Design of forms.
7.10 Question order.
7.11 Question content.
7.12 Question wording.
7.13 Question types.
7.14 Examples.
References.

## Chapter 8 Sampling from Imperfect Frames

126

8.1 Introduction.
8.2 Target and frame populations.
8.3 Extraneous units.
8.4 Duplication.
8.5 Inaccuracies.
8.6 Redefinition of target population.
8.7 Sampling from lists.
8.8 Area sampling.
8.9 The predecessor-successor method.
8.10 Frames used in sampling work.
8.11 Examples of sampling from frames.
References.

## Chapter 9 The Design of Samples

139

9.1 Introduction.
9.2 Stratification.
9.3 Mode of stratification.
9.4 The number of strata.
9.5 Allocation of sample to strata.
9.6 Gains from stratification.
9.7 Systematic sampling.
9.8 Cluster sampling.
9.9 Cost functions in cluster sampling.
9.10 Multiphase sampling.
9.11 Controlled selection.
9.12 Nationwide surveys.
9.13 Design of nationwide samples. References.

#### Chapter 10 Execution of Surveys

153

10.1 Pilot surveys. 10.2 Selection of enumerators. 10.3 Training of enumerators. 10.4 Supervision of enumerators. 10.5 Control of quality of fieldwork. 10.6 Observation. 10.7 Reinterviews. 10.8 Field edit. 10.9 Follow-up of nonresponse. 10.10 Interpenetrating subsamples. 10.11 Time reference and reference period. 10.12 Processing of the data. 10.13 Editing. 10.14 Coding. 10.15 Tabulation. 10.16 Control of data processing. 10.17 Use of computers. 10.18 Report writing. 10.19 General report. 10.20 Technical report. References.

CONTENTS

Part 4.	Data	Collection	in	Selected	Fields
~ ****	~~~~~	COHCOHOII	111	DOICULGU	1 151015

Chapter 11	Surveys of	Agricultural	Area	1
Chapter 11	Surveys of	Agricultural	Area	1

175

11.1 Introduction. 11.2 Basic concepts. 11.3 Census of holdings by interview. 11.4 Cadastral surveys by physical observation. 11.5 Current agricultural statistics. 11.6 Sample census of areas in developing countries. 11.7 Sampling by administrative areas. 11.8 Grid sampling. 11.9 Joint use of list and area sampling. 11.10 Mixed crops. 11.11 Methods of measurement. 11.12 Concluding remarks. References.

# Chapter 12 Surveys of Agricultural Production

192

12.1 Introduction.
12.2 Crop reports.
12.3 The method of crop cutting.
12.4 Selection of fields.
12.5 Location of sample cuts.
12.6 The size of sample cuts.
12.7 The shape of the plot.
12.8 Experiments on cultivators' fields.
12.9 Mixed crops.
12.10 Sample design for yield surveys.
12.11 Stratification.
12.12 Sample size.
12.13 The estimation procedure.
12.14 The Indian survey of food production.
12.15 Concluding remarks.
References.

## **Chapter 13 Demographic Surveys**

206

13.1 Introduction. 13.2 The household as sampling unit. 13.3 Age-sex distribution. 13.4 Marital status. 13.5 Births. 13.6 Lifetime fertility. 13.7 Deaths. 13.8 Infant mortality. 13.9 Adjustment for recall lapse. 13.10 Sampling for births and deaths: retrospective method. 13.11 Successive surveys of the same areas: follow-up method. 13.12 Internal migration. 13.13 Use of registration data. 13.14 Total population. References.

# Chapter 14 Employment and Unemployment Surveys

223

14.1 Introduction. 14.2 Basic concepts. 14.3 The labor force. 14.4 Type of activity and employment status. 14.5 Usual versus current status. 14.6 Priority versus principal status. 14.7 Reference period. 14.8 The questionnaire for urban areas. 14.9 Employment in rural areas. 14.10 Measurement of underemployment. 14.11 Greek labor force survey. 14.12 The United States Current Population Survey. 14.13 The Japanese labor force survey. 14.14 Concluding remarks. References.

CONTENTS xi

## **Chapter 15 Consumer Expenditure Surveys**

consumer expenditures. References.

15.1 Introduction. 15.2 Consumer expenditure. 15.3 Measurement of expenditure. 15.4 Methods of collecting information. 15.5 The account-book method. 15.6 The interview method. 15.7 Choice of the reference period. 15.8 Joint use of interview and account-book methods. 15.9 Research and experimentation. 15.10 The Greek budget survey of 1958. 15.11 The British family expenditure survey. 15.12 The United States survey of

#### Chapter 16 Surveys of Health

16.1 Introduction.
16.2 The concept of ill health.
16.3 Definition of sickness.
16.4 Methods of measurement.
16.5 The prevalence survey.
16.6 The incidence survey.
16.7 Duration of sickness.
16.8 Choice of respondent.
16.9 Choice of probes.
16.10 Choice of reference period.
16.11 Validation of survey data.
16.12 The questionnaire.
16.13 The United States National Health Survey.
16.14 The Japanese National Health Survey.
16.15 The British survey of sickness.
References.

## **Chapter 17 Industrial Surveys**

17.1 Introduction. 17.2 The data to be collected. 17.3 The unit of enumeration. 17.4 Classification of industrial activity. 17.5 The international system of classification. 17.6 Classification of industrial products. 17.7 Classification of establishments by size. 17.8 Skewness of distribution. 17.9 Sample allocation. 17.10 The method of cutoff. 17.11 The sampling unit. 17.12 Classified directory. 17.13 Small-plant economies. 17.14 Household industry. 17.15 The United States Annual Survey of Manufactures. 17.16 The Indian Annual Survey of Industries. References.

## **Chapter 18 Surveys of Distributive Trade**

18.1 Introduction.
18.2 The data needed.
18.3 The distribution of stores by size.
18.4 The frame.
18.5 Use of population data.
18.6 Nonresponse.
18.7 Errors of listing and classification.
18.8 Sample rotation.
18.9 Household trade.
18.10 The United States survey of wholesale trade.
18.11 The United States survey of wholesale trade.

241

258

275

293

xii CONTENTS

Chapter 19	Sampling as an Aid to Censuses		
	<ul> <li>19.1 Introduction.</li> <li>19.2 Advance tabulation of census.</li> <li>19.3 Use of systematic sampling.</li> <li>19.4 Suggested method of sampling.</li> <li>19.5 Adjustment for defects.</li> <li>19.6 Postenumeration surveys.</li> <li>19.7 List sample.</li> <li>19.8 Area sample.</li> <li>19.9 Other coverage checks.</li> <li>19.10 Content check.</li> <li>19.11 Sample as part of census.</li> <li>19.12 Sample of households.</li> <li>19.13 Sample of persons.</li> <li>19.14 Control of</li> </ul>		
	data processing. References.		

## Chapter 20 Surveys in Other Fields

326

308

20.1 Introduction. 20.2 Surveys of road traffic. 20.3 Public opinion surveys. 20.4 Marketing research. 20.5 Payroll surveys. 20.6 Postal traffic surveys. 20.7 Food consumption surveys. 20.8 Sociological Research. References.

Appendix 1	International Standard Industrial Classification of All Economic Activities	360
_	7 Localottica	300
Appendix 2	Random Numbers	364
Appendix 3	Notations Used	369
Appendix 4	Answers to Problems	371
	Index	275