AN INTRODUCTION TO STATISTICS

AN INTRODUCTION TO STATISTICS

Arthur H. Hall

© Marjorie H. Hall 1978

All rights reserved. No part of this publication may be reproduced or transmitted, in any form or by any means, without permission.

First published 1978 by

THE MACMILLAN PRESS LTD

London and Basingstoke

Associated companies in Delhi Dublin Hong Kong

*Johannesburg Lagos Melbourne New York Singapore
and Tokyo*

British Library Cataloguing in Publication Data

Hall, Arthur H

An introduction to statistics.

1. Mathematical statistics.

I. Title

519.5

QA276

ISBN 978-1-349-03148-1 ISBN 978-1-349-03146-7 (eBook)

DOI 10.1007/978-1-349-03146-7

This book is sold subject to the standard conditions of the Net Book Agreement.

The paperback edition of this book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, resold, hired out, or otherwise circulated without the publisher's prior consent in any form of binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

CONTENTS

Preface	vii
PART 1	
1 Introduction – the How, Why and Wherefore of Statistics	3
2 Averages	6
3 The Arithmetic Mean	9
4 Dispersion	16
5 Cumulative Frequencies	24
6 Discrete and Continuous Measurement	29
7 The Mode and Median	37
8 Approximation	44
9 Bivariate Distributions – Correlation, Regression	50
10 Rank Correlation	59
11 Time Series	64
12 Weighted Averages and Index Numbers	74
13 Further Graphical Methods of Presenting Data	85
14 The Normal Distribution	94
PART 2	
15 Sampling	103
16 Surveys and Polls	108
17 Tabulation of Data	113
18 Pictorial Representation of Data	118
19 Government and Other Statistics	129
ANSWERS	135
INDEX	141

PREFACE

This text is an amplification of teaching notes used for O.N.D. and O-level courses at the College of Further Education, Lytham St Annes. It owes a great deal to the present Head of the Department of Commerce and Business Studies, Mr J. Darlington, who has given constant help and encouragement to the author.

With the upsurge of interest in statistics in recent years it not infrequently happens that courses have to be taken by teachers whose primary interest has been another subject or whose personal experience has been more theoretical than practical. It is hoped that the wide range of data used in both examples and exercises will prove of value to them. O.N.D. assessors have not been slow to point out the limited use of suitable material in papers submitted to them. And examiners in general try to widen the scope of their question papers in their efforts to beat the pure crammers!

No actual examination papers will be found in the text, but there is an ample supply of questions which are of parallel difficulty. With the differences between boards and also O.N.D. the exercises would have had to be considerably extended. It is better for both teacher and student to supplement the course and to revise using appropriate previous question papers.

Mathematical and statistical tables have not been included. Apart from the inconvenience of flicking pages forwards and backwards, it is in the interest of students to familiarise themselves with the tables they will use on the day of their examination. And of course the day will come when tables are replaced by the pocket calculator.

Teachers, as well as students working on their own, will find the course fairly flexible, and can modify the order of topics to suit their own preference. Each of the two parts is in a logical sequence, but is not completely independent. But Chapter 18 at least needs to be read before Chapter 14.

The author acknowledges the Director of the Central Statistical Office and the Controller of H.M. Stationery Office as those permitting the use of Government data from the *Monthly Digest of Statistics (MD)*, the *Annual Abstract (AA)*, the *Abstract of Regional Statistics (AR)* and the *Balance of Payments Blue Book (BB)*. The latter is also thanked for permission to provide summaries of selected governmental processes in the final chapter.