

# **Principles and Practice of Community Medicine**

---



# Principles and Practice of Community Medicine

---

**Asma Rahim**

Asst. Professor

Department of Community Medicine

Medical College

Calicut, Kerala

India



---

**JAYPEE BROTHERS MEDICAL PUBLISHERS (P) LTD**

New Delhi • Ahmedabad • Bengaluru • Chennai  
Hyderabad • Kochi • Kolkata • Lucknow • Mumbai • Nagpur

*Published by*

Jitendar P Vij

**Jaypee Brothers Medical Publishers (P) Ltd**

B-3, EMCA House, 23/23B Ansari Road, Daryaganj

**New Delhi** 110 002, India

Phones: +91-11-23272143, +91-11-23272703, +91-11-23282021, +91-11-23245672, Rel: +91-11-32558559

Fax: +91-11-23276490, +91-11-23245683 e-mail: jaypee@jaypeebrothers.com

Visit our website: www.jaypeebrothers.com

### **Branches**

- 2/B, Akruiti Society, Jodhpur Gam Road Satellite  
**Ahmedabad** 380 015 Phones: +91-79-26926233, Rel: +91-79-32988717, Fax: +91-79-26927094  
e-mail: ahmedabad@jaypeebrothers.com
- 202 Batavia Chambers, 8 Kumara Krupa Road, Kumara Park East  
**Bengaluru** 560 001 Phones: +91-80-22285971, +91-80-22382956, +91-80-22372664, Rel: +91-80-32714073  
Fax: +91-80-22281761 e-mail: bangalore@jaypeebrothers.com
- 282 Illrd Floor, Khaleel Shirazi Estate, Fountain Plaza, Pantheon Road  
**Chennai** 600 008 Phones: +91-44-28193265, +91-44-28194897, Rel: +91-44-32972089  
Fax: +91-44-28193231 e-mail: chennai@jaypeebrothers.com
- 4-2-1067/1-3, 1st Floor, Balaji Building, Ramkote Cross Road  
**Hyderabad** 500 095 Phones: +91-40-66610020, +91-40-24758498, Rel: +91-40-32940929  
Fax: +91-40-24758499, e-mail: hyderabad@jaypeebrothers.com
- No. 41/3098, B & B1, Kuruvi Building, St. Vincent Road  
**Kochi** 682 018, Kerala Phone: +91-484-4036109, +91-484-2395739, +91-484-2395740  
e-mail: kochi@jaypeebrothers.com
- 1-A Indian Mirror Street, Wellington Square  
**Kolkata** 700 013 Phones: +91-33-22651926, +91-33-22276404, +91-33-22276415, Rel: +91-33-32901926  
Fax: +91-33-22656075, e-mail: kolkata@jaypeebrothers.com
- Lekhranj Market III, B-2, Sector-4, Faizabad Road, Indira Nagar  
**Lucknow** 226 016 Phones: +91-522-3040553, +91-522-3040554 e-mail: lucknow@jaypeebrothers.com
- 106 Amit Industrial Estate, 61 Dr SS Rao Road, Near MGM Hospital, Parel  
**Mumbai** 400012 Phones: +91-22-24124863, +91-22-24104532, Rel: +91-22-32926896  
Fax: +91-22-24160828, e-mail: mumbai@jaypeebrothers.com
- "KAMALPUSHPA" 38, Reshimbag, Opp. Mohota Science College, Umred Road  
**Nagpur** 440 009 (MS) Phone: Rel: +91-712-3245220, Fax: +91-712-2704275 e-mail: nagpur@jaypeebrothers.com

### **Principles and Practice of Community Medicine**

© 2008, Asma Rahim

All rights reserved. No part of this publication should be reproduced, stored in a retrieval system, or transmitted in any form or by any means: electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the author and the publisher.

This book has been published in good faith that the material provided by author is original. Every effort is made to ensure accuracy of material, but the publisher, printer and author will not be held responsible for any inadvertent error(s). In case of any dispute, all legal matters are to be settled under Delhi jurisdiction only.

*First Edition : 2008*

ISBN : 81-8448-172-1

*Typeset at* JPBMP typesetting unit

*Printed at* Replica Press

*This book is dedicated to  
my Students !*



# Foreword

It is my proud privilege to write foreword to the textbook entitled *Principles and Practice of Community Medicine*. Our country has definitely made significant progress in the field of health care delivery system during the past five decades. Yet one cannot deny that apportioning our limited resources amongst sectors providing primary, secondary and tertiary health care has been injudicious. The tertiary health care sector is unduly glorified; whereas the promotive, preventive and rehabilitative aspects of health care have not still been given due consideration. Our syllabus for medical students and training the students received were also in that line. However it is very much gratifying that Medical Council of India has perused the matter in the right perspective and made an attempt to rectify the defects. The objective of medical education spelt out in the "Regulation on Graduate Medical Education 1997" is a reflection of the current thinking of academicians in the field of medical education.

Any textbook on Community Medicine should take into due consideration the new trends in the medical education and should provide sufficient information on health scenario of our country, social and environmental factors influencing health and diseases and intervention programmes. This textbook – Principles and Practice of Community Medicine has succeeded largely in achieving these objectives. The layout of different chapters and the simplicity of the language are also appreciable. I have no hesitation in recommending this textbook as a "quick revision text" for Undergraduate and Postgraduate medical students and as a comprehensive textbook for nursing and paramedical students.

**Dr. C. SADASIVANPILLAI**

MD, DPH, PGDIM, PGDHRM, FISC. D

Principal

MES Medical College

Perinthalmanna, Kerala

(Former Prof. & HOD of Community Medicine and Former  
Director of Medical Education, Kerala)





# Preface

It is being repeatedly stressed that Community Medicine is one of the most important branches of Medicine. Many undergraduates lament that this is a highly conceptual subject too difficult to assimilate and memorise. Most of the books currently available in this subject are too exhaustive and elaborate. A student often memorises the least important facts and leaves out the most important facts in the process. Elaborate concepts, poor application of the principles taught, frequently changing public health scenario, over and above poor teaching methods makes this subject most unpalatable to the Medical student.

As an Undergraduate Student I had yearned for a concise textbook presented in a lucid style in Community Medicine. Least did I know that Lord had kept in store for me a career in this field and would direct me into writing a textbook on this subject. The habit of jotting down important points in any subject I read, has helped me a lot in preparing this manuscript. I admit that a keen and critical reader may not find elaborate concepts in this textbook to rack his brains upon, but he is sure to find what is most required.

I have taken great care not to leave out important topics like General Epidemiology, Environment, Hospital Hygiene, Immunisation etc. which are often poorly dealt with in most of the currently available books. It is my sincere belief that all topics have been treated with equal importance.

The reader may find the presentation a little different as the key points are highlighted for holding readers immediate attention. This book is sure to serve as a quick reference during exams for the Medical students. It is my strong intuition that this book will be handy for allied medical disciplines like Dentistry, Nursing, Pharmacy and even Medical Officers from the Health services. I believe that I have been able to bring out the '**Essence of Community Medicine**' in this textbook.

**Asma Rahim**



# Acknowledgements

I wish to place on record my deep gratitude to Dr C Sadasivanpillai, Principal, MES Medical College, Perinthalmanna for the very encouraging foreword he wrote on this book. I am deeply indebted to my teachers, Dr Leelamoni K, Professor and Head of Community Medicine, Medical College, Karakonam. Her unflagging support and learned advice have gone a long way in improving the quality of this publication. I wish to thank Dr Ramla Beegum, Professor and Head of Community Medicine, Medical College, Kolenchery for the encouragement and inspiration she has been to me.

Surely this book would not have seen the light of the day had it not been for the unstinting support of my Professors Dr K Vijayakumar, and Dr Thomas Bina. I am greatly obliged to them for their assistance and kindness.

I would like to thank all my Colleagues and Postgraduates in the Department of Community Medicine for their unconditional support.

My thanks are due to the Personnel at M/s Jaypee Brothers Medical Publishers, New Delhi for their role in bringing out this publication in time.

No words can adequately express my heartfelt appreciation of the meticulous secretarial assistance of Mrs. Shailaja Bhattathiri of Gayatri Graphics, Calicut. Her quality conscious efforts will be evident in every chapter of this book.

I would also like to thank profusely Mr Prasanth CB, Statistician, Department of Community Medicine for his contributions to the topic of Biostatistics.

I am extremely thankful to my father Dr M Mahamood, Retd. Director and Professor of Pediatrics, Medical College, Calicut and my mother Mrs Aysha Mahamood who have been a constant source of inspiration and support for me throughout my life. They were committed in providing a conducive environment for the successful completion of this book.

Finally I thank the Lord for blessing me with my husband Dr Raheem and our daughters Jumana and Raniya who have shared with me both the agony and ecstasy in the preparation of this manuscript.



# Contents

## SECTION 1: HEALTH AND DISEASE AT A GLANCE

- |                                     |    |
|-------------------------------------|----|
| 1. Concept of Community Medicine    | 3  |
| 2. Health—An Overview               | 5  |
| 3. Disease Causation and Prevention | 12 |

## SECTION 2: PRIMARY HEALTH CARE AND ITS IMPLEMENTATION

- |                                   |    |
|-----------------------------------|----|
| 4. Concept of Primary Health Care | 23 |
| 5. Primary Health Centre          | 28 |
| 6. Health Systems in India        | 33 |

## SECTION 3: PLANNING AND MANAGEMENT IN HEALTH CARE

- |  |    |
|--|----|
| 7. Health Planning                         | 39 |
| 8. Principles of Management in Health Care | 42 |
| 9. Health Planning Over the Years in India | 47 |
| 10. Health Economics                       | 50 |
| 11. National Health Policy 2002—Review     | 52 |
| 12. Evaluation of Health Service           | 54 |

## SECTION 4: HEALTH EDUCATION AND COMMUNICATION

- |  |    |
|--|----|
| 13. Concept of Health Education                  | 59 |
| 14. Techniques of Health Education               | 62 |
| 15. Role of Audiovisual Aids in Health Education | 65 |
| 16. Steps in the Conduct of Health Education     | 67 |
| 17. Role of Communication in Health Education    | 69 |

## SECTION 5: GENERAL EPIDEMIOLOGY

- |                                       |     |
|---------------------------------------|-----|
| 18. Epidemiologic Approach to Disease | 73  |
| 19. Measures of Disease Frequency     | 76  |
| 20. Measuring Magnitude of a Disease  | 80  |
| 21. Measures of Risk                  | 86  |
| 22. Epidemiological Study Designs     | 90  |
| 23. Association and Causation         | 106 |
| 24. Investigation of Epidemic         | 110 |
| 25. Screening for Diseases            | 114 |

**SECTION 6: INFECTIOUS DISEASE EPIDEMIOLOGY**

- |  |     |
|--|-----|
| 26. Terms in Infectious Disease Epidemiology | 121 |
|--|-----|

**SECTION 7: PRINCIPLES AND PRACTICE OF IMMUNISATION**

- |                                |     |
|--------------------------------|-----|
| 27. Principles of Immunisation | 135 |
| 28. Practice of Immunisation   | 139 |
| 29. Cold Chain System          | 143 |
| 30. Newer Vaccines             | 146 |

**SECTION 8: COMMUNICABLE DISEASES**

- |   |     |
|---|-----|
| 31. Viral Infections                            | 151 |
| 32. Bacterial Infections                        | 190 |
| 33. Parasitic Infections                        | 237 |
| 34. Clinical Syndromes                          | 266 |
| 35. Rickettsial Diseases of Clinical Importance | 281 |
| 36. Endemic Treponematosi                       | 284 |

**SECTION 9: NONCOMMUNICABLE DISEASES**

- |   |     |
|---|-----|
| 37. Hypertension                                | 289 |
| 38. Obesity                                     | 292 |
| 39. Coronary Heart Disease                      | 294 |
| 40. Diabetes                                    | 298 |
| 41. Rheumatic Fever and Rheumatic Heart Disease | 302 |
| 42. Cerebrovascular Disease—Stroke              | 305 |
| 43. Blindness                                   | 307 |
| 44. Cancer                                      | 310 |
| 45. Accidents                                   | 316 |
| 46. Mental Health                               | 319 |
| 47. Alcoholism: Epidemiology and Prevention     | 322 |
| 48. Drug Abuse: Prevention and Control          | 325 |

**SECTION 10: MEDICAL SOCIOLOGY**

- |                                       |     |
|---------------------------------------|-----|
| 49. Introduction to Medical Sociology | 329 |
| 50. Role of Psychology in Medicine    | 331 |
| 51. Sociology and Society             | 334 |
| 52. Social Class                      | 338 |

**SECTION 11: DEMOGRAPHY AND HEALTH INFORMATION**

- |  |     |
|--|-----|
| 53. Demography                                   | 345 |
| 54. Health Information in National Health System | 350 |

**SECTION 12: FAMILY PLANNING**

55. Concept of Family Planning	357
56. Contraceptive Methods	360

**SECTION 13: MATERNAL AND CHILD HEALTH**

57. Care of the Mother	377
58. Child Health	386
59. MCH Care Indicators	393
60. Care of the Child	401
61. Preventive Geriatrics	408
62. Social Problems in Childhood	410

**SECTION 14: NUTRITION**

63. Principles of Nutrition	421
64. Nutritional Problems in India	435

**SECTION 15: TOWARDS HEALTHY ENVIRONMENT**

65. Water	455
66. Water Quality Standards	463
67. Air Temperature and Monitoring	470
68. Ventilation	476
69. Lighting	477
70. Noise Pollution	478
71. Solid Waste Disposal	480
72. Excreta Disposal: Urban and Rural Areas	484
73. Sewerage System in India	489
74. Housing Standards in India	494
75. Radiation Hazards: Prevention and Control	495

**SECTION 16: OCCUPATIONAL HEALTH**

76. Occupational Health Risks	501
77. Legislative Measures in Occupational Health	512

**SECTION 17: GENETICS AND HEALTH**

78. Genetic Basis of Inheritance	517
79. Common Genetic Disorders	519
80. Application of Genetics in Preventive Medicine	523
81. Prevention and Control of Genetic Disorders	524
82. Advances in Genetics	528

**SECTION 18: ROLE OF BIOSTATISTICS IN MEDICINE**

83. Data Collection and Presentation in Research	533
84. Measures of Central Tendency	542
85. Measures of Dispersion (Spread)/Variability	544
86. Concept of Standard Error	548
87. Sampling Techniques	550
88. Statistical Tests	553

**SECTION 19: MEDICAL ENTOMOLOGY**

89. Bionomics of Mosquitoes	561
90. Integrated Vector Control	565
91. Arthropods of Medical Importance	568
92. Zoonotic Diseases	575

**SECTION 20: EMERGING AND RE-EMERGING INFECTIOUS DISEASES**

93. Emerging and Re-emerging Infectious Diseases: A Global Threat	579
---	-----

**SECTION 21: HOSPITAL HYGIENE**

94. Hospital Acquired Infections	585
95. Infection Control	587
96. Hospital Waste Management	590

**SECTION 22: MISCELLANEOUS**

97. Disaster Management	595
98. International Health	601
99. National Health Programmes in India: A Review	605
100. World Health Day Themes	609

<i>Appendices</i>	611
-------------------	-----

<i>Bibliography</i>	615
---------------------	-----

<i>Index</i>	617
--------------	-----