Contents

SECTION 1: Health and Disease at a Glance

1. History of Public Health and Concept of Community Medicine **1**

• History of Public Health 1 • Miasma Theory 1 • Public Health Measures 1 • Germ Theory of Disease and its Implications 2 • Great Sanitary Awakening 2 • Public Health in the 21st Century 2 • Phases of Public Health 3 • Preventive Medicine 3 • Social Medicine 4 • Pioneers in Public Health 4 • Public Health in India 5

2. Health: An Overview **7**

• Health 7 • New Definition of Health 7 • Operational Definition 7 • Dimensions of Health 7 • Positive Physical Health 7 • Spectrum of Health 8 • Concept of Well-being 8 • Quality of Life 8 • Physical Quality of Life Index 8 • Human Development Index 9 • Gender-related Development Index 9 • Human Poverty Index 9 • Multidimensional Poverty Index 9 • Global Hunger Index 10 • Measurement of Health: Health Indicators 10 • Medical Care versus Health Care 12 • Health Team Concept 12 • Right to Health 13

3. Disease Causation and Prevention **14**

• Disease 14 • Epidemiological Triad 14 • Agent 14 • Host 14 • Environment 15 • Web of Causation Model 15 • Natural History of Disease 15 • Rehabilitation 17 • Iceberg Phenomenon 18 • Concept of Risk Factor 18 • Terminologies Used in Disease Prevention 18 • Monitoring 19 • Sentinel Surveillance 19 • Community Diagnosis 19 • Classification of Diseases 20

SECTION 2: Primary Health Care and its Implementation

4. Concept of Primary Health Care **22**

• Primary Health Care: Historical Perspective 22 • Health as a Fundamental Human Right 22 • Role of Community and Health Services in Attaining Primary Health Care 22 • Levels of Health Care 22 • Concept of Primary Health Care 22 • Definition 22 • Essential Components/Elements of Primary Health Care 23 • Principles of Primary Health Care 23 • Primary Health Care in India 25 • Implementing Primary Health Care at Various Levels 25

5. Healthcare Delivery in India **27**

• Primary Health Center 27 • Subcenters 28 • Community Health Center 30 • District Hospitals 31 • First Referral Units 32 • Job Functions of PHC Medical Officer 33 • Job Responsibilities—Female Health Worker 35

6. Health System in India **39**

• Public Health Sector 39 • Private Sector 39 • Indigenous Systems of Medicine 39 • Voluntary Health Agencies in India 42 • Democratic Decentralization and *Panchayati Raj* Institutions 43 • *Panchayati Raj* in India 44

7. Health Profile of India **47**

• National Health Profile 47 • Overview 2015 47 • Demographic Indicators 47 • Socioeconomic Indicators 47 • Health Status Indicators 49 • Health Finance Indicators 50 • Millennium Development Goals 51 • Sustainable Development Goals 52

SECTION 3: Planning and Management in Health Care

8. Health Planning **53**

• Health Planning 53 • Steps in Planning Cycle 54

9. Principles of Management in Health Care **56**
• Functions of an Ideal Manager 56 • Management Techniques 56 • Qualitative Techniques (Based on Behavioural Sciences) 56 • Quantitative Techniques 57 • Operational Research 59 • Health Services Research 59 • Material Management in Health Care 60 • Principles and Models for Inventory Control 60

10. Health Planning Over the Years in India **61**
• Bhore Committee (1946) 61 • Mudaliar Committee (1962) 61 • Chadha Committee (1963) 61 • Mukerji Committee (1965–1966) 61 • Jungalwalla Committee (1967) 62 • Kartar Singh Committee (1973) 62 • Shrivastava Committee (1975) 62 • Rural Health Scheme (1977) 62 • Bajaj Committee, 1986 62 • Rome Scheme (1997) 63 • Five-Year Plans 63

11. Health Economics **65**
• Assessment of Economic Performance 65 • Standard of Living 66 • Cost in Health Care 66 • Evaluating Health Economics 66

12. National Health Policy 2002, Millennium Development Goals, Sustainable Development Goals and National Health Policy 2015 Draft: A Review **68**
• Historical Perspective 68 • Current Scenario 68 • Objectives of NHP 2002 68 • Salient Features of NHP 2002 68 • Millennium Development Goals 69 • Sustainable Development Goals 71 • National Health Policy 2015 Draft 73 • Major Policy Initiatives 74

13. Evaluation of Health Services **76**
• Definition 76 • How does Evaluation Help? 76 • Who does the Evaluation? 76 • Indicators for Evaluation 76 • Basic Steps in Evaluation 76 • Tools for Evaluation 76 • Essential Elements of Evaluation Process 76 • Medical Audit 77

SECTION 4: Health Education and Communication for Behavioural Change

14. Concept of Health Education **78**
• Historical Development 78 • Objectives of Health Education 78 • Rationale for Health Education 78 • Principles of Health Education 79 • Approaches to Health Education 79 • Health Education Models 80 • Contents of Health Education 81

15. Techniques of Health Education **82**
• Classification of Techniques—Group Size-based Classification 82 • Individual Approach 82 • Group Approach 82 • Demonstrations 82 • Group Discussions (Small Group Technique) 82 • Focal Group Discussions 83 • Other Types of Group Discussions 83 • Differences between Symposium and Panel Discussion 84 • Conference 84 • Workshop (Small Group) 84 • Role Playing (Small Group) 84 • Other Methods 85 • Fishbowl Conversation (Large Group) 85

16. Role of Audiovisual Aids in Health Education **86**
• Classification and Types 86 • Nonprojected Visual Aids Chalkboard 86 • Flannel Graph and Flannel Board 86 • Flip Charts 86 • Flash Cards 86 • Projected Visual Aids 86 • Overhead Projector 86 • Interactive White Board 87 • Smart Classrooms 87

17. Steps in the Conduct of Health Education **88**
• Health Education Campaign 88 • Child-to-Child Program 89

18. Role of Communication in Health Education **90**
• Functions of Health Communication 90 • Components of Communication Process 90 • Channels of Communication 90 • Types of Communication 90 • Barriers of Communication 91 • Applications 91 • Doctor–Patient Communication 92 • Benefits of Good Communication 92 • Impact of Poor Communication 92 • Obstacles to Good Communication 92

SECTION 5: General Epidemiology

19. Epidemiologic Approach to a Disease **94**
• Epidemiology 94 • Community Diagnosis 95

20. Measuring Magnitude of a Disease **96**
• Basic Tools for Measuring Magnitude of a Disease 96 • Measures of Mortality 96
• Standardization 98 • Role of Death Certificates in Mortality Measurement 99

21. Measures of Disease Frequency **100**
• Prevalence 100 • Point Prevalence 101 • Period Prevalence 101 • Incidence 101
• Relationship between Incidence and Prevalence 102

22. Measures of Risk **103**
• Common Measures of Risk 103 • Concept of Risk Factor 103
• Role of Epidemiological Studies in Risk Measurement 103

23. Epidemiological Study Designs **106**
• Descriptive Epidemiology 106 • Time Trends 107 • Time Trends: Short-term Fluctuations 107
• Place Distribution: Where? 108 • Person Distribution 108 • Cross-sectional Studies (Prevalence Study) 109 • Analytical Studies 109 • Case-Control Study 111
• Clinical Trials 115 • Randomized Controlled Trial 115

24. Association and Causation **118**
• Association 118 • Causation 118

25. Investigation of Epidemic **121**
• Types of Outbreaks 121 • Steps in an Outbreak Investigation 121 • Classic Outbreak Investigations 123

26. Screening for Diseases **124**
• Screening 124 • Acceptability 125 • Repeatability (Reliability, Precision, Reproducibility) 125
• Validity 126 • Yield 127 • How to Evaluate a Screening Test? 128

27. Steps in Medical Research **130**
• Steps in Medical Research: Preinvestigation Steps 130 • Investigation Steps 131
• Postinvestigation Steps 131 • Application of Computers in Research 132

SECTION 6: Infectious Disease Epidemiology

28. Terms in Infectious Disease Epidemiology **134**
• Infection 134 • Communicable Disease/Infectious Disease 134 • Terms in Disease Occurrence 134
• Terms in Disease Transmission 135 • Host 136 • Case 137 • Incubation Period 138
• Period of Communicability 139 • Terms in Disease Containment 139 • Carriers 140
• Modes of Disease Transmission 141

SECTION 7: Principles and Practice of Immunization

29. Principles of Immunization **143**
• Principles of Immunity 143 • Lymphoid System 143 • Immune Response 143 • Types of Immunity 144
• Herd Immunity 145 • Immunoglobulins 146

30. Practice of Immunization **147**
• Terms in Immunization 147 • Vaccination 147 • Universal Immunization Program 148

31. Vaccination under Special Circumstances **152**
• Special Circumstances 152 • Child with Unknown Immunization Status 152 • Why is BCG given only up to 1 Year of Age? 152 • Routine Immunization 152 • Other Circumstances 153

32. Cold Chain System **154**
• Definition 154 • Key Elements of the Cold Chain 154 • Essential Elements of a Cold Chain 154
• Activities to be carried out to Manage the Cold Chain System 154 • Enumerate the Eligible 154
• Cold Chain Equipment and Temperature Range 156 • Remember 158

33. Vaccines in Current Use **159**
• Vaccines in Relation to Specific Diseases 159

SECTION 8: Communicable Diseases

34. Viral Infections **166**
• Respiratory Infections 166 • Smallpox 166 • Chickenpox (Varicella Zoster) 167
• Measles (Rubeola) 168 • Mumps 170 • Rubella 171 • Influenza 172
• H1N1 Influenza (Pandemic Influenza) (2009) 173 • Hand, Foot and Mouth Disease 176
• Mosquito-Borne Viral Infections 177 • Dengue Fever 177 • Yellow Fever 184
• Chikungunya Fever 185 • At the Point of First Contact (PHC/CHC Level) 187
• Japanese Encephalitis 189 • West Nile Fever 191 • Viral Intestinal Infections 192
• Poliomyelitis 192 • Acute Flaccid Paralysis Surveillance 195 • Viral Hepatitis 199
• Hepatitis A 199 • Hepatitis E 201 • Parenteral Infections 202 • Hepatitis B 202
• Hepatitis C 206 • Delta Hepatitis 207 • Hepatitis G (GB Virus C) 208 • Hepatitis F Virus 208
• Viral Immune Deficiency Syndrome 208 • Antiretroviral Treatment 214 • Zoonotic Viral Infections 221
• Rabies 221 • Postexposure Treatment 222 • Pre-exposure Immunization: Rabies 227
• Ebola Virus Disease 228 • Tick Borne Viral Infection 229 • Kyasanur Forest Disease (Monkey Disease) 229
• Sandfly Fever 230 • Other Common Respiratory Syndromes 231

35. Bacterial Infections **232**
• Respiratory Infections 232 • Diphtheria 232 • Pertussis (Whooping Cough) 235 • Tuberculosis 236
• Meningococcal Meningitis 248 • Bacterial Surface Infections 249 • Tetanus 249 • Trachoma 252
• Leprosy 253 • Zoonotic Bacterial Infections 260 • Plague 260 • Brucellosis 264 • Leptospirosis 265
• Management Guidelines to PHC Medical Officers 268 • Anthrax 269 • Intestinal Infections 270
• Typhoid Fever 270 • Food Poisoning 273 • Epidemiology of Bacterial Food Poisoning 274
• Clinical Importance of Rickettsial Diseases 277 • Scrub Typhus 278 • Epidemic Typhus 282
• Brill-Zinsser Disease 282 • Trench Fever 283 • Q Fever 283 • Tick Typhus (Indian Tick Typhus) 284
• Endemic Typhus 284 • Spotted Fever Group 285 • Endemic Treponematoses 286 • Yaws 286

36. Parasitic Infections **288**
• Helminthic Diseases 288 • Ascariasis 288 • Hookworm Infection 289 • Ancylostomiasis 289
• Guinea Worm Disease 290 • Dracunculiasis 290 • Guinea Worm Eradication Program 292
• Tapeworm Disease (Taeniasis) 293 • Human Cysticercosis (Neurocysticercosis) 294 • Hydatid Disease (Dog Tapeworm) 295 • Echinococcosis 295 • Enterobius Vermicularis (Pinworm Infections) 296
• Trichuris Trichiura (Whipworm) 296 • Strongyloides Stercoralis (Threadworm Infection) 297
• Strongyloidiasis 297 • Diseases due to Protozoa 297 • Amebiasis 297 • Leishmaniasis 299
• Sandfly and Leishmaniasis 300 • Kala Azar Elimination Initiative 301 • Malaria 301
• Epidemiological Patterns of Malaria (India) 302 • Active Case Detection and Passive Case Detection 306
• Fever Treatment Depots 307 • Drug Distribution Center 307 • National Antimalarial Program 307
• National Malaria Eradication Program (1958–1977) 307 • Urban Malaria Scheme (1971) 307
• Modified Plan of Operation (1977) 308 • Malaria Action Plan (1995) 308 • Enhanced Malaria Control Program (1997) 308 • Roll Back Malaria 308 • National Drug Policy on Malaria (2013) 308
• Treatment of Uncomplicated Malaria 309 • Drug Schedule for Treatment of Malaria under NVBDCP 309
• Treatment of *P. vivax* Cases 309 • Treatment of Uncomplicated *P. Falciparum* Cases in Pregnancy 309
• Treatment of Mixed Infections (*P. vivax* + *P. Falciparum*) Cases 310 • Treatment of Severe Malaria Cases 310
• Chemoprophylaxis 311 • Lymphatic Filariasis 311 • Elimination Activities 314
• Parasitic Skin Infestation 315 • Scabies 315 • Scarabiasis 316

37. Clinical Syndromes **317**
• Acute Respiratory Tract Infections 317 • Acute Diarrheal Diseases 319 • Cholera 323
• Sexually Transmitted Diseases 328

SECTION 9: Noncommunicable Diseases

38. Hypertension **337**
• Burden of Noncommunicable Diseases 337 • Hypertension 337 • Classification of Blood Pressure 337
• Prevalence 337 • Trends in Hypertension 337 • Phenomenon of Tracking 338 • Rule of Halves 338
• Epidemiology 338 • Prevention and Control 339 • Hypertension Control Programs at National Level 341

39. Obesity **342**
• Body Mass Index 342 • Abdominal Obesity 342 • Classification of Body Mass Index (WHO) 342
• Prevalence 342 • Epidemiology 342 • Assessment of Obesity 343 • Prevention of Obesity 343

40. Coronary Heart Disease **345**
• Manifestations 345 • Epidemiology 345 • Prevention and Control 347 • Cardiac Care Cycle 349
• Intervention Trials in Coronary Heart Disease 349

41. Diabetes **350**
• Classification 350 • Prevalence 350 • Epidemiology 350 • What are the Common Consequences of Diabetes? 352 • Prevention and Control 352 • Treatment 353 • Government Programs 354

42. Rheumatic Fever and Rheumatic Heart Disease **355**
• Prevalence 355 • Epidemiology 355 • Clinical Features 355 • Prevention of Acute Rheumatic Fever 356

43. Cerebrovascular Disease: Stroke **358**
• Clinical Classification 358 • Problem 358 • Epidemiology 358 • Prevention 359 • National Program 360

44. Blindness **361**
• Definition 361 • Prevalence 361 • Epidemiology 362 • Prevention of Blindness 362 • Rehabilitation 362
• National Program for Control of Blindness 362 • District Blindness Control Society 363

45. Cancer **365**
• Definition 365 • Classification 365 • Prevalence 365 • Epidemiology 365 • Prevention of Cancers 367
• Epidemiology of Selected Cancers 369 • Oral Cancer 369 • Cancer Cervix 369 • Cancer Breast 371
• Cancer Lung 373 • Cancer Stomach 374 • National Cancer Control Program 375 • Cancer Screening 375

46. Accidents **378**
• Definition 378 • Prevalence 378 • Types of Accidents 378 • Epidemiology: Road Traffic Accidents 379
• Key Risk Factors 379 • Prevention of Accidents 379 • Burns 381 • Drowning 382
• Gender-based Violence 384

47. Mental Health **385**
• Magnitude of the Problem 385 • Epidemiology 385 • Types of Psychiatric Disorders 386
• Programs at the National Level 387

48. Alcoholism: Epidemiology and Prevention **389**
• Magnitude of the Problem 389 • Epidemiology 389 • Prevention 389

49. Drug Abuse: Prevention and Control **393**
• Magnitude of the Problem 393 • Epidemiology 393 • Common Drugs Abused 394
• Prevention of Alcohol and Drug Abuse 397

SECTION 10: Medical Sociology

50. Introduction to Medical Sociology **398**
• Medical Sociology 398 • Terms in Sociology 398 • Socialization 398 • Customs 398 • Culture 398

51. Role of Psychology in Medicine **400**
• Definition 400 • Medical Psychology 400 • Medical Psychology and Community Medicine 400
• Emotions and Health 400 • Motivation 400 • Frustration and Conflicts 401 • Defense Mechanisms 401
• Learning and Health Behaviour 401 • Intelligence Quotient 402

52. Sociology and Society **403**
• Social Organizations 403 • The Family 404 • Cultural Factors in Health and Disease 405
• Importance 405 • Cultural Factors and Health 405

53. Social Class **407**
• Social Mobility 407 • Social Class 407 • Scales to Measure Socioeconomic Status of a Community 407
• Wealth Index 408 • Operational Research 408 • Medical Social Worker 408 • Interview Techniques 408
• Social Problems 409 • Health Insurance Schemes in India 410 • Public (Social) Health Insurance Schemes 411
• Private Health Insurance Schemes 411 • Comprehensive Health Insurance Scheme 411 • Hospital Sociology 412

SECTION 11: Demography and Health Information

54. Demography **413**
• Demographic Cycle 413 • World Population Trends 413 • Growth Rates 414 • Demographic Gap 414
• Age Pyramid 414 • Sex Ratio 414

55. Health Information in National Health System **418**
• Health Information 418 • Census 418 • Registration of Vital Events 420 • Sample Registration System 421
• Population Surveys 422 • National Family Health Survey 422

SECTION 12: Family Planning

56. Concept of Family Planning **424**
• Fertility 424 • Milestones in Family Welfare Program 425 • Target-free Approach (1995–1996) 425
• Community Need Assessment Approach 425 • Cafeteria Approach 425 • Eligible Couples 425

57. Contraceptive Methods **427**
• Contraceptives 427 • Spacing Methods 427 • Intrauterine Devices 429 • Miscellaneous Methods 434
• Natural Family Planning Methods 434 • Postconceptional Methods 434 • Abortion Methods 435
• Medical Abortion 436 • Reasons for Unsafe Abortions in India 436 • Terminal Methods 436
• Laparoscopy 437 • Contraceptive Effectiveness 438 • Adolescence and Contraception 439
• National Family Welfare Program 439 • National Population Policy 440 • National Sociodemographic Goals 441
• Future of India 441

SECTION 13: Maternal and Child Health

58. Care of the Mother **442**
• Safe Motherhood 442 • Safe Motherhood Interventions 442 • Antenatal Care 442 • Intranatal Care 451
• Postnatal Care 452 • Infant Feeding (Breastfeeding) 452

59. Care of the Child **456**
• Newborn Care 456 • Neonatal Period 456 • Neonatal Screening 457 • Low-Birth-Weight Babies 459
• Child Health Problems in India 460 • Integrated Management of Neonatal and Childhood Illness 461
• School Health 463 • Growth and Development 466 • Growth Chart 469 • Congenital Malformations 472

60. Maternal and Child Health Indicators **473**
• Maternal Mortality Rate 473 • Perinatal Mortality Rate 474 • Neonatal Mortality Rate 475
• Postneonatal Mortality Rate 475 • Infant Mortality 475 • Causes of Infant Mortality 475
• Pentavalent Vaccine Immunization Schedule 476 • 1–4-year Mortality Rate 477
• Under-Five Mortality Rate 477 • National Programs Targeted Towards Maternal and Child Health 478
• Child Survival and Safe Motherhood Program 478 • National Health Mission 481

61. Preventive Geriatrics **484**
• Geriatrics 484

62. Social Problems in Childhood **486**
• Major Social Problems 486 • Handicapped Child 486 • Juvenile Delinquency 487 • Behavioural Disorders of Childhood 487 • Child Abuse 488 • Street Children 488 • Child Labour 489 • Child Marriage 489
• Child Rights in India 490 • Child Trafficking 490

SECTION 14: Nutrition

63. Principles of Nutrition **492**
• Nutrients 492 • Carbohydrates 492 • Dietary Fibers and Health 492 • Glycemic Index 492
• Proteins 493 • Fats 495 • Vitamins 497 • Minerals 501 • Role of Trace Elements in Nutrition 503
• Nutrition Facts 506 • Dietary Goals 509 • Balanced Diet 509

64. Nutritional Problems in India **512**
• Protein-Energy Malnutrition 512 • Classification of Protein-Energy Malnutrition 513
• Vitamin A Deficiency 516 • Nutritional Anemia 517 • Iodine Deficiency Disorders 517
• Endemic Fluorosis 518 • Diseases due to Food Toxins 519 • Nutritional Status Assessment 521
• Nutritional Surveillance 521 • Ecology of Nutritional Disorders 521 • Food Hygiene 522
• Food Adulteration 524 • Community Nutrition Programs 526 • National Nutrition Policy 528
• National Food Security Bill, 2013 528

65. Nutritional Factors in Chronic Diseases **529**
• Diabetes 529 • Diet in Cardiovascular Diseases 744

SECTION 15: Towards a Healthy Environment

66. Water **533**
• Components of Environment 533 • Physical Components—Environment 533 • Water Purification 534
• Disinfection on Large Scale 537 • UNICEF Action 538 • Background of Water Supply Program in India 538
• Objective 538 • Norms 538

67. Water Quality Standards **539**
• Physical Parameters 539 • Microbiological Standards 539 • Surveillance of Drinking Water Quality 540
• Health Hazards of Water Pollution 542 • Sanitation of Public Places 542 • Hardness of the Water 542
• Fluoridation of Drinking Water 543 • Rain Water Harvesting 543

68. Air Temperature and Monitoring **544**
• Causes of Discomfort 544 • Composition of Air 544 • Thermal Comfort 544 • Air Pollution 544
• Air Temperature 547 • Humidity 548

69. Ventilation **549**
• Types of Ventilation 549

70. Lighting **550**
• Light Measurement Units 550 • Daylight Measurement 550 • Artificial Illumination 550
• Biological Effects of Light 550

71. Noise Pollution **551**
• Sound 551 • Noise 551

72. Solid Waste Disposal **553**
• Types of Waste 553 • Steps in Solid Waste Management 553 • Degradable Waste Disposal 553
• Dumping 553 • Burning 553 • Sanitary Landfilling or Controlled Tipping 553
• Biomethanation Process: Biogas 554 • Composting 554

73. Excreta Disposal: Urban and Rural Areas **556**
• History 556 • Excreta Disposal in India 556 • Sanitary Latrines and Disease Prevention 556
• Water Closets (Two Types) 558

74. Sewage System in India **560**
• Sewage 560 • Sullage 560 • Steps in Sewage Treatment 560 • Liquid Waste Disposal: Soakage Pit 562

75. Housing Standards in India **564**
• Criteria for Healthy Housing (WHO) 564 • Classification of Houses 564 • Indicators of Housing 564
• Health Impact of Poor Housing 564 • Government Initiatives 564

76. Radiation Hazards: Prevention and Control **567**
• Radiation: General Facts 567 • Key Points on Radiation Exposure 569

SECTION 16: Occupational Health

77. Occupational Health Risks **570**
• Ergonomics (Human Engineering) 570 • Occupational Health Hazards 570
• Pneumoconiosis 572 • Organic Pneumoconiosis 574 • Lead Poisoning 575
• Occupational Cancers 576 • Occupational Dermatitis 576 • Occupational Radiation Hazards 577
• Agriculture: The Occupational Hazards 577 • Occupational Accidents: Prevention and Control 578
• Industrialization: Health Impact 578 • Occupational Diseases: Prevention and Control 579
• Sickness Absenteeism 581 • National Programme for Occupational Health 581

78. Legislative Measures in Occupational Health **582**
• Important Factory Laws 582 • Migrant Workers in India 586

SECTION 17: Genetics and Health

79. Genetic Basis of Inheritance **588**
• Human Genetics 588 • Chemical Basis of Inheritance 588 • Methods of Chromosome Study 589

80. Common Genetic Disorders **590**
• Classification of Genetic Disorders 590 • Chromosomal Disorders 590 • Autosomal Disorders 590
• Sex Chromosomal Abnormalities 591 • Genes 592 • Unifactorial Inheritance 593
• Autosomal Dominant Disorders 593 • Autosomal Recessive Inheritance 594
• Thalassemia 595 • Sex-linked Inheritance 596 • Polygenes/Multiple Genes 597
• Multifactorial Inheritance 597

81. Application of Genetics in Preventive Medicine **598**
• Population Genetics 598

82. Prevention and Control of Genetic Disorders **599**
• Stages of Prevention 599 • Eugenics 599 • Euthenics 600 • Genetic Counselling 600
• Prevent Late Marriages 601 • Discourage Consanguineous Marriages 601 • Specific Protection 601
• Pedigree 601 • Secondary Prevention of Genetic Disorders 601

83. Advances in Genetics **603**
• DNA Technology 603 • Human Genome Project 603 • Gene Therapy 603 • Cloning 603

SECTION 18: Role of Biostatistics in Medicine

84. Data Collection and Presentation in Research **605**
• Statistics 605 • Types of Data 605 • Variables 605 • Presentation of Data 606
• Visual Display of Information 606

85. Measures of Central Tendency **610**
• Sample Mean 610 • Median 610 • Mode 610 • Examples of Mean, Median and Mode Calculation 610
• Summary of When to Use the Mean, Median and Mode 611

86. Measures of Dispersion (Spread)/Variability **613**
• Percentiles 613 • Quartiles and Interquartile Range 613 • Range 613 • Standard Deviation 614
• Coefficient of Variation 615 • Mean Deviation 615 • Normal Curve 615 • Skewing 616
• Bimodal Distribution 616 • Poisson Distribution 616 • Binomial Distribution 617 • Variability 617
• Probability 617 • Central Limit Theorem 617

87. Concept of Standard Error **618**
• Standard Error of the Mean 618 • Reference Ranges 618 • Confidence Interval 619

88. Sampling Techniques **620**
• Population Sampling 620 • Sampling 620 • Types of Sampling 620 • Sample Size Estimation 624

89. Statistical Tests **625**
• Hypothesis Testing and Statistical Inference in Research 625 • Statistical Tests 627 • t-test 627 • Z–test 628 • One-tailed t-test 629 • Multiple t-test 629 • ANOVA Test 629 • Hypothesis Testing 630 • F-ratio 630 • Nonparametric Tests 630 • Application of Statistical Tests 631 • Relationship between Variables 631 • Correlation 632 • Regression 633 • Meta-analysis 635 • Common Statistical Packages for Medical Research 636

SECTION 19: Medical Entomology

90. Bionomics of Mosquitoes **637**
• Bionomics 637 • Biology 637 • Life Cycle 637 • Anopheles 637 • Culex 638 • Mansonoides 638 • Aedes 639

91. Integrated Vector Control **640**
• Definition 640 • Aims of Integrated Vector Control 640 • Advantages 640 • Integration of Control Measures with Emphasis on Mosquitoes 640 • Insecticide Resistance in India 643 • Insecticide Poisoning 644

92. Arthropods of Medical Importance **645**
• Classification 645 • Class of Arthropods 645 • Diseases Caused by Arthropods 645 • Sandflies 646 • Black Fly 646 • Lice 646 • Fleas 647 • Reduviid Bugs 647

93. Zoonotic Diseases **650**
• Definition 650 • Control of Zoonoses 650 • Zoonotic Diseases of Public Health Importance 650

SECTION 20: Emerging and Re-emerging Infectious Diseases

94. Emerging and Re-emerging Infectious Diseases: A Global Threat **651**
• Emerging Diseases 651 • Re-emerging Diseases 651 • Factors Contributing to the Spread 651 • Emerging and Re-emerging Diseases: Changing Patterns 651 • Steps in Prevention and Control 653 • Severe Acute Respiratory Syndrome 653 • Avian Influenza (Bird Flu) 653 • Middle-east Respiratory Syndrome 654 • Hand, Foot, and Mouth Disease 654 • Hantavirus Pulmonary Syndrome 655 • Ebola Virus Disease 656 • Zika Virus Disease 656 • International Health Regulations (Revised) 657

SECTION 21: Hospital Hygiene

95. Hospital-acquired Infections **659**
• Hospital-acquired Infections (Nosocomial Infections) 659 • Indian Scenario 659 • Classification 659 • Sources and Reservoirs of Hospital-acquired Infections 659 • Mode of Transmission 660 • Prevention and Control 660

96. Infection Control in Healthcare Settings **661**
• Terms in Infection Control 661 • Types of Disinfection 661 • Effective Use of Sterilization and Disinfection 661 • Methods of High Level Disinfection 662

97. Hospital Waste Management **666**
• Hospital Waste/Biomedical Waste 666 • Categories of Biomedical Wastes 666 • Technologies for Waste Treatment and Disposal 666 • Principles of Treatment 668 • Biomedical Waste (Management and Handling) Rules, 1987 672 • Biomedical Waste (Management and Handling) Draft Rules, 2011 672

SECTION 22: Miscellaneous

98. Disaster Management **673**
• Definition 673 • Classification 673 • Natural Disasters: World Scenario 673 • Current World Concern (Nuclear Disaster) 673 • Steps of a Disaster Preparedness Program 676

99. International Health **678**
• Milestones in International Health 678 • World Health Organization 678 • UNICEF 679 • UNDP 680 • Food and Agriculture Organization 680 • International Labour Organization 680 • World Bank 680 • Bilateral Agencies 681 • Nongovernmental Agencies 681

100. National Health Programs in India: A Review **683**
• Reproductive and Child Health Program (1997) 683 • *Janani Suraksha Yojana* 684 • Pulse Polio Program (1995) 685 • Acute Flaccid Paralysis Surveillance 686 • Acute Respiratory Infection Control Program 688 • Acute Diarrheal Diseases Control Program 688 • Revised National Tuberculosis Control Program 689 • Nikshay 691 • Switch from Intermittent to Daily Regimen 691 • National Leprosy Eradication Program 692 • Guinea Worm Eradication Program (1983–1984) 692 • National AIDS Control Program 693 • National Vector-Borne Disease Control Programs (2003–2004) 697 • National Antimalaria Programme 697 • Urban Malaria Scheme 697 • Japanese Encephalitis Control Program 699 • Yaws Elimination 700 • Integrated Disease Surveillance Program 700 • Nutritional Programs 701 • Mid-Day Meal Program 702 • National Iodine Deficiency Disorder Control Program 703 • National Program for Blindness Control 704 • National Mental Health Program 705 • National Cancer Control Program 706 • National Program for Prevention and Control of Deafness 707 • National Program for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke 707 • National Health Mission 710 • National Rural Health Mission–The Vision 710 • Components of NHM 713 • National Urban Health Mission 714 • National Initiatives on Disability Limitation and Rehabilitation 714

101. World Health Day Themes **716**
• World Health Day 2016 716 • World Health Day 2015—Food Safety 716 • Vector–Borne Disease (2014) 717 • Health Calendar: Important • Health Days 717

102. Essential Medicines and Counterfeit Medicines **719**
• Criteria for the Selection of Essential Medicines 719 • Structure of the List 719 • Essential Medicine List in India 720 • Categories of Medicines 720 • Counterfeit Medicines 720

103. Legislations in Public Health **722**
• Census Act, 1948 722 • The Registration of Births and Deaths Act 722 • The Epidemic Diseases Act, 1897 722 • Transplantation of Human Organs Act, 1994 722 • Prevention of Food Adulteration Act, 1954 723 • Food Safety and Standards Act, 2006 723 • International Health Regulations (2005) 723 • Cigarettes and Other Tobacco Products Act, 2003 724 • Narcotic Drugs and Psychotropic Substances Act 724 • Medical Termination of Pregnancy Act, 1971 724 • The Dowry Prohibition Act, 1961 (Amended 1986) 724 • Immoral Traffic Prevention Act 725 • Prenatal Diagnostic Techniques Act, 1994 725 • Juvenile Justice Act, 2000 726 • Child Labour (Prohibition and Regulation) Act, 1986 726 • The Persons with Disabilities Act, 1995 727 • Factories Act, 1948 727 • Environment Protection Act, 1986 727 • Biomedical Waste Management Rules, 2016 728 • The Consumer Protection Act, 1986 728 • The Infant Milk Substitutes, Feeding Bottles and Infant Foods (Regulation of Production, Supply and Distribution) Act, 1992 729

104. Urban Health **730**
• Urban Sprawl 730 • Overcrowding 730 • Housing 730 • Unemployment 730 • Slums and Squatter Settlements 730 • Transport 730 • Water 731 • Sewerage Problems 731 • Waste Disposal 731 • Urban Crimes 731 • Urban Pollution 731 • Health Problems 731 • Major Urban Development Programs 731

Appendices *733*

Index *737*