$See \ discussions, stats, and author \ profiles \ for \ this \ publication \ at: \ https://www.researchgate.net/publication/337951021$

Elements of Health and Medical Geography

Book · January 2020

CITATION:	S	READS 2,542	
2 autho	rs:		
8	Eric K.W. Aikins University of Cape Coast	R	Ana Isabel Ribeiro Institute of Public Health, University of Porto
	3 PUBLICATIONS 12 CITATIONS		191 PUBLICATIONS 2,698 CITATIONS
	SEE PROFILE		SEE PROFILE
Some of the authors of this publication are also working on these related projects:			



Project Local Burden of Disease Project (LBD) View project

Project Socio-Economic Differentials in Healthy Ageing View project

Elements of Health and Medical Geography



Eric K. W. Aikins Ana Isabel Ribeiro

Elements of Health and Medical Geography



Eric K. W. Aikins Ana Isabel Ribeiro KendallHunt



A

Acquired immune deficiency syndrome (AIDS). See Human immunodeficiency virus Adenoviruses, 67, 71 Agent-based infectious disease transmission model, 40 - 42Agent infectivity, 38-39 Agent-host-environment model, 36-38 Air pollution, 108–109 American Sociological Association, 154 Analogy, 146 Antiretroviral therapy (ART), 79 ArcMap/ArcGIS geographic information system mapping with exercises, 212 laboratory exercises, 197-211 mapping activities, 197-211 pre-mapping preparation, 191-197 resources, 212 Ascaris hookworm, 91 Available health care, knowledge about, 155-156 Average duration per case or disability rate (ADPC/DR), 166-167 Average length of hospital stay (ALOS), 167–168 Azithromycin, 76

B

Bacteria, 66 Benzathine penicillin G, 81 Bias, 143-144 Bills of Mortality, 127 Biodiversity, defined, 120 Biodiversity hypothesis, 121 Biodiversity loss, 120-121 environmental risk transition, 123 freshwater depletion and contamination, 122-123 land-use changes and soil degradation, 121-122 systems approach to planetary health, 123-124 Biological defence, 68 Biological gradient, 145 Biopsychosocial model of health and illness, 43-46 Birth statistics, 164 Block randomization, 141 Brain attack. See Stroke Buffering analysis, 189, 204-209

С

Cancer, 97–100 Cancer Radiotherapy and Nuclear Medicine treatment centre, 159 Cardiovascular disease, 91–92. *See also* Heart attack; Stroke Case-control studies, 137–139 Case fatality rate or index of severity (CFR/IS), 168 Case rate, 166 Causality, 145-146 Ceftriaxone, 76 Centers for Disease Control and Prevention (CDC), 26, 48, 148 Cerebral embolism, 96 Cerebral hemorrhage, 96 Cerebral thrombosis, 96 Chemical defense, 68 Child mortality (CM), 170 Children ever born (CEB), 172 Chlamydia, 74-75 Chlamydia trachomatis, 74 Chlorofluorocarbons (CFC), 31 Cholera, 1-3, 42, 86-89 Choropleth mapping, 197–204 geographic spread of diseases, 189 mapping of disease occurrence, 188 Chronic diseases. See Noncommunicable diseases Citizen science, 180 Classic Antiquity, 126 Climate, 106-108 Cluster analytical techniques, 189 Co-infection, 14 Coherence, 145 Cohort studies, 132-135 Coliformbacilli, 66 Collaborative mapping, 181 Common cold, 71-72 Communicable diseases, 65-66 communicable disease-causing micro-organisms, characteristics of, 66-67 defences against, 68 factors affecting spread of, 67-68 spatial distribution of chlamydia, 74-75 cholera, 86-89 common cold, 71–72 gonorrhea, 75-77 human immunodeficiency virus, 78-80 malaria, 83-85 neglected tropical diseases, 91 syphilis, 80-83 tuberculosis, 72-74 typhoid fever, 89-90 Community Based Health Planning and Services (CHPS), 158 Comorbidity, 13-14 Component cause A, 47 Confounding, 144-145 Consistency, 145 Contagious diseases. See Communicable diseases

Contemporary health care delivery, 25-26 Corona viruses, 67, 71 Coxsackie viruses, 67 Cross-sectional studies, 135-137 Crowd sensing, 180–181 Crowdsourced Geographic Information applications of disaster relief, 181–182 environmental exposures, 183 health surveillance, 182 definitions and concepts, 179-180 limits of, 183-184 sources, 180-181 Crude birth rate/birth rate (CBR/BR), 172-173 Crude death rate/death rate (CDR/DR), 170-171 Cure, 16

D

Data analysis (manipulation), 187 capturing/acquisition, 186-187 information source, health statistics as, 164 health administration data, 177 health status indicators, 164-176 portrayal, 187 retrieval, 187 storage, 187 Death statistics, 164 Demographic and ecological transitions and development model, 27-28, 32-34 Demographic transition model, 28-30 Deprivation amplification hypothesis, 116 Determinants of health, 16-24 Developed and developing countries, accessibility in available health care, health services, and medical assistance, 155-156 physical/geographical accessibility to health care, 156-160 social, cultural, and religious practices, 162 socioeconomic development, income, and poverty, 160-162 Diagnostic and Statistical Manual of Mental Disorders (DSM), 14 Direct contact, 40, 42 Disability-adjusted life year (DALY), 102-103 Disaster relief, 181-182 Disease, 13 agent, 37 burden disability-adjusted life year, 102-103 quality-adjusted life year, 101 years of potential life lost, 100-101



control, 15 defined, 63 factors influencing development and transfer of, 35 frequency measures, 165-166 hosts, 66 infection, stages of, 14-15 nature of, 64 occurrence mapping of, 188 patterns of, 64 prevention and health promotion models health belief model, 50-53 social-ecological model, 47-50 types of, 64. See also specific types Disorder, 14 Disparity, 147-148. See also Health care Distribution, 125 Double blinding, 142 Double masking, 142 Duration measures, 166-168

E

Ebola epidemic, 56 Echo viruses, 67 Ecological studies, 131-132 Ecological transitional model, 30-31 Economic health care disparities and inequalities, 153-154 Endemic diseases, 64 Engel, George L., 43 Engels's biopsychosocial model of health and illness. See Biopsychosocial model of health and illness Entero viruses, 67 Environment, diseases, and health interrelationships, 105-106 physical environment air pollution, 108-109 climate and weather, 106-108 food environment and geographies of addition, 113 natural and green space, 109-111 other physical exposures, 114-115 urban form, 111–113 social environment neighborhood safety and violence, 117 neighborhood socioeconomic deprivation, 115-116 social capital, 116-117 social norms, 117-118 Environmental degradation (ED), 30 Environmental exposure, 39-40, 183

Environmental factors, 20 Environmental injustice, 115 Environmental Kuznet curve hypothesis (EKC), 27, 30 Environmental risk transition, 123 Environmental Systems Research Institute (ESRI), 5, 26 Epidemic diseases, 64 Epidemiologic triangle. See Agent-host-environment model Epidemiology causality, 145-146 confounding, 144-145 definition and nature of, 125-126 errors, 143-144 history and epidemiological paradigms, 126-130 types of studies in, 130 case-control studies, 137-139 cohort studies, 132-135 cross-sectional studies, 135-137 ecological studies, 131-132 experimental studies, 140-142 quasi-experimental studies, 142-143 randomized clinical trial, 140-142 "Equigenic" equipment, 111 Errors, 143-144 Ethnicity, defined, 154 Experiment, 146 Experimental studies, 140-142

F

Facebook, 180 Farr, William, 127–128 Fertility measures, 172–174 Flare up, 15–16 FluNearYou, 182 Food desert, 113 Food environment and geographies of addition, 113 Freshwater depletion and contamination, 122–123 Fungi, 66

G

Geochat, 182 Geocoding, 180 Geographic information system (GIS), 5, 6–7, 25–26 application of techniques in health geography research, 187 mapping of disease occurrence, 188 mapping of geographic spread of diseases, 189 mapping of spatial relationships, 190 definitions and concepts, 185 mapping with ArcMap/ArcGIS exercises, 212

laboratory exercises, 197-211 mapping activities, 197-211 pre-mapping preparation, 191–197 resources, 212 role in research in health geography, 185-186 types of geospatial data acquisition and analysis techniques in, 186-187 Geographic spread of diseases, mapping of, 189 Geographical models of disease transmission and spread, 53 spatial diffusion of disease model, 54-58 triangulated disease transmission model, 58-61 Geographical/spatial health care disparities and inequalities, 152-153 Georeferencing, 180 Geospatial data acquisition, 186-187 Global environmental change, diseases, and health interrelationships, 119-120 biodiversity loss, 120-121 environmental risk transition, 123 freshwater depletion and contamination, 122-123 land-use changes and soil degradation, 121-122 systems approach to planetary health, 123-124 Global Positioning System (GPS), 180 Goldberger, Joseph, 129 Gonorrhea, 75-77 Google Earth, 183 Google Flu Trend (GFT), 182 Google Maps, 180, 181 Government policies, 156-157 Graunt, John, 127 Green space, 109-111

Η

Hägerstrand, Torsten, 54 Haiti earthquake, 182 Hand cartography, 185, 187 "Harvesting" effect, 107 Health concepts and scope, 13-16 defined, 63-64 determinants of health, 16-24 geographical definition of, 12-13 health geography in contemporary health care delivery and health promotion, 25-26 health promotion, 24-25 medical definition of, 9-10 World Health Organization holistic model, 11 wellness model, 11-12 Health administration data, 177

Health and Medical Geography Specialty group of the Association of American Geographers, 4 Health behavior change programs, 49 Health belief model cue to action, 52 perceived barriers to action, 52 perceived benefit of action, 52 perceived severity, 51-52 perceived susceptibility, 51 sense-efficacy, 52-53 Health care availability, allocation, location, and distance to, 157-158 barriers to health care provision and accessibility in developed and developing countries available health care, health services, and medical assistance, 155-156 physical/geographical accessibility to health care, 156-160 social, cultural, and religious practices, 162 socioeconomic development, income, and poverty, 160-162 defined, 149 disparities and inequalities, 152-153 economic, 153-154 geographical/spatial, 152-153 racial/ethnic, 154-155 disparity, 148 primary, 149-150 provision, barriers to, 155-162 secondary, 150-151 system, 21 tertiary, 151-152 Health disparity, 148 Health-field model, 18-19 four-factor, 21-22 three-factor, 19-21 Health geography application of crowdsourced data in. See Crowdsourced Geographic Information challenges to, 7-8 defined, 4-5 geographic information system application in research, 187-190 definitions and concepts, 185 geospatial data acquisition and analysis techniques in, 186-187 role in research, 185-186 history of, 1-3 importance of, 6-7 Health promotion, 24-25 health geography in, 25-26



Health services, 155-156 Health statistics definitions and concepts, 163 as source of data/information, 164 health administration data, 177 health status indicators, 164-176 as statistical measurement tool/technique, 164 vital statistics, 164 Health status indicators, 164-176 Health surveillance, 182 Health triangle, 17-18 HealthMap, 182 Heart attack, 92-95 Hemorrhagic stroke, 96 Herpes viruses, 67 High blood pressure, 93 Hippocrates, 105, 126 Holistic model, 11 Host, 35 susceptibility, 39 Human biology (biomedical) factors, 20 Human immunodeficiency virus (HIV), 58, 78-80 Human para influenza virus, 71 Human population growth, 120 Humidity, 108 Hypertension, 93

Ι

Illness, 13 Incidence rate, 165 Income accessibility, 160–162 Incubation period, 14 Indoor air pollution, 109 Inequalities, 147–148. *See also* Health care Infant mortality rate (IMR), 169 Infectious diseases. *See* Communicable diseases Influenza/flu. *See* Common cold Influenzanet, 182 Innovation diffusion, 54 Instagram, 180 Institute of Medicine, 154 Intermediate host, 35 Ischemic stroke, 96

K

Karelia study, 121 Koch, Robert, 129

L

Lactobacilli, 66 Lalonde report, 18 Land-use, 112 changes, 121–122 Latency period, 14–15 Life expectancy at birth, 171 Lifestyle factors, 19–20 *Limits to Growth, The*, 123 Lind, James, 140–141 Localized disease, 64 Luther, Martin, 127 Lymphatic filariasis, 91

M

MacMahon, Brian, 139 Mainstream theory, 128 Malaria, 42, 60-61, 83-85 pathogens, 37-38 Map overlay mapping, 190, 209-211 MapMyFitness, 182 Mapping, 6. See also specific types Means/mode of transmission, 35 Measures of risk factors/effect of disease, 174-176 Mechanical defense, 68 Medical assistance, 155-156 physical/geographical accessibility to health care, 156-160 social, cultural, and religious practices, 162 socioeconomic development, income, and poverty, 160-162 Medical condition, 14 Medical geography, 5 Medical model, 9-10 Medical professionals, availability of, 159-160 Metastatic/disseminated disease, 64 "mHealth," 182 Miasma theory, 127 Micro-organisms, communicable disease-causing, 66-67 Middle Ages, 126 Migration statistics, 164 Millennium development goals (MDGs), 156 Mobile phone network data, 182 Modern and specialized health care, availability of, 158-159 Morbidity, 13 defined, 63 measures, 165 Mortality displacement, 107 measures, 169-171

N

National Health Systems, 151

Mycobacterium tuberculosis, 72

National Institutes of Health, 148 Natural space, 109-111 Necessary cause, 47 Neglected tropical diseases (NTDs), 91 Neighborhood safety and violence, 117 Neighborhood socioeconomic deprivation, 115-116 Neisseria gonorrheae, 79 Neogeography, 180 Neonatal mortality rate (NNMR), 169-170 New Urbanism, 112 Nitrogen oxides (NO), 108 Noise, 114 Noncommunicable diseases (NCDs), 68-69 causes of, 69 occurrence and rate of spread of, 69 prevalence and classification of, 70 spatial distribution of cancer, 97-100 cardiovascular disease, 91-95

0

Obesogenic environment, 113 Odds ratio (OR), 136, 176 Onchocerciasis, 91 OpenStreetMap, 180, 181, 182, 183 Ottawa Charter for Health Promotion, 11, 13 Outdoor air pollution, 108–109 Ozone (O_3) , 108

P

Pan American Health Organisation (PAHO), 24 Pandemic diseases, 64 Parasites, 66 Participatory sensing applications, 179 Particulate matter (PM), 108 Pathogen, 16 factors affecting spread of, 35-36 People as sensors, 181 Per capita gross domestic product (GDP), 32-33 Physical environment air pollution, 108-109 climate and weather, 106-108 food environment and geographies of addition, 113 natural and green space, 109-111 other physical exposures, 114-115 urban form, 111-113 Physical/geographical accessibility, to health care, 156-160 Planetary health, systems approach to, 123-124 Planning of health care services, 26 Plasmodium falciparum, 37, 84

Plasmodium malariae, 84 Plasmodium ovale, 84 Plasmodium vivax, 84 Plausibility, 145 Pollution, 108. See also Air pollution Post-natal mortality rate (PNMR), 170 Poverty, 160–162 Pre-mapping preparation, 191–197 Prevalence rate, 165–166 Primary health care, 149–150 Progressive disease, 15 Protozoans, 67 Public Health Agency of Canada, 22 Public Health Service of the Unites States of America, 51 Public Open Space Tool (POST), 183

Q

Quality-adjusted life year (QALY), 101 Quasi-experimental studies, 142–143

R

Race, defined, 154 Racial/ethnic health care disparities and inequalities, 154-155 Radon, 109 Random error, 143 Randomized clinical trial (RCT), 140-142 Rate ratio (RR), 175–176 Refractory disease, 16 Relative standing model, 116 Remission, 16 Resident bacteria, 66 Respiratory syncytial virus, 71 Rhino viruses, 67, 71 Rickettsia, 67 Risk ratio/relative risk, 134, 174-175 Robert Graham Center, 4, 25, 26 Romano, John, 43 Rothman's causal pies model, 46-47 Route for spread of infectious disease model, 38-40

S

Salmonella typhi, 89 Saprophytes, 66 Schistosomiasis, 91 Secondary health care, 150–151 Severity measure, 168 Sexually transmitted diseases (STDs). See specific diseases Sickness, 13 Simple randomization, 141 Snow, John, 1–3, 127–128



Social capital, 116-117 Social environment neighborhood safety and violence, 117 neighborhood socioeconomic deprivation, 115-116 social capital, 116-117 social norms, 117-118 Social media, 180 Social norms, 117-118 Social-ecological model, 47-49 community level, 49-50 individual level, 49 interpersonal/relationship level, 49 organizational level, 50 policy level, 50 Socioeconomic deprivation, 115-116 Socioeconomic development, 160-162 Soil degradation, 121-122 Soil-transmitted helminths, 91 Spatial analysis, 6-7, 25-26, 186 Spatial diffusion of disease model, 54 contagious diffusion, 55-56 expansion spatial diffusion, 55 hierarchical spatial diffusion, 58 relocation diffusion, 56-58 Spatial model, 12-13 Spatial relationships, mapping of, 190 Spatial statistics, 6-7 Specificity, 145 Static/stable disease, 15 Statistical measurement tool/technique, health statistics as, 164 Stratified randomization, 141 Strength, 145 Stroke, 96-97 Sufficient cause, 47 Sulfur oxides (SO), 108 Sustainable development goals (SDGs), 156 Syphilis, 80-83 latent stage, 81 primary chancre/sore stage, 80 secondary/body rash stage, 81 tertiary/final stage, 81 Systematic error, 143-144 Systemic disease, 64 Systems approach to planetary health, 123-124

Т

Temperature–mortality relationship, 107 Temporality, 145 Tertiary health care, 151–152 Thematic mapping. *See* Choropleth mapping Theories and models in health geography, 27-28 demographic and ecological transitions and development model, 32-34 demographic transition model early population explosion stage, 29 high stationary stage, 28-29 late population explosion stage, 29-30 low stationary stage, 30 disease prevention and health promotion models health belief model, 50-53 social-ecological model, 47-50 ecological transitional model, 30-31 geographical models of disease transmission and spread, 53 spatial diffusion of disease model, 54-58 triangulated disease transmission model, 58-61 infectious diseases, models for explaining causes and transmission of, 36-42 noninfectious diseases, models for explaining causes and transmission of, 43-47 Time-trends, 132 Total fertility rate (TFR), 173-174 Trachoma, 91 Transferrable diseases. See Communicable diseases Transportation availability of, 158 systems, 112 Treponema pallidum, 80 Triangulated disease transmission model, 58-61 Trichophyton rubrum, 66 Tropical nights, 107 Trypanosoma brucei, 66 Tuberculosis (TB), 39, 72-74 Twitter, 180 Typhoid fever, 89-90

U

Ultraviolet (UV) radiation, 114 Under five mortality rate (UFMR), 169 United Nations Children's Emergency Fund (UNICEF), 48, 160 Urban design, 112 Urban form, 111–113 Urban heat islands (UHI), 122 Urbanization-biodiversity dynamic, 121 U.S. Department of Health and Human Services, 148 Ushahidi, 182

V

Vibrio cholerae, 87, 129 Viral latency, 15 Viruses, 66–67. *See also specific types* Vital statistics, 164

W

Walkability index, 112 Water contamination, 114–115 Weather, 106–108 Web 2.0, 180 Wellness model, 11–12 West Nile Virus, 120 Whipworm, 91 Wilkinson's hypothesis, 116 World Health Organization (WHO), 11–12, 122, 160 air pollution, 108 gonorrhea, 79 health, definition of, 63 health inequality, 148 health promotion, 24 health statistics, 163 human immunodeficiency virus, 79 noncommunicable diseases, 69 social determinants of health, 22 tuberculosis, 72 World Health Report, 66

Y

Years of potential life lost (YPLL), 100-101



ELEMENTS OF HEALTH AND MEDICAL GEOGRAPHY



- **CHAPTER 1.** Nature and Scope of Health Geography 1
- **CHAPTER 2.** Health: Concepts and Scope 9
- **CHAPTER 3.** Theories and Models in Health Geography 27
- **CHAPTER 4.** Diseases/Morbidity and Health 63
- **CHAPTER 5.** Environment, Diseases, and Health Interrelationships 105
- **CHAPTER 6.** Global Environmental Change, Diseases, and Health Interrelationships 119
- **CHAPTER 7.** Epidemiology 125
- **CHAPTER 8.** Health Care Disparities and Inequalities 147
- **CHAPTER 9.** Health Statistics 163
- **CHAPTER 10.** Application of Crowdsourced Data in Health Geography Research 179
- **CHAPTER 11.** Geographic Information Systems (GIS) and Spatial Analysis in Health Geography 185
- **CHAPTER 12.** Health and Disease Mapping in GIS with ArcMap: Laboratory Exercises 191





CHAPTER 1. NATURE AND SCOPE OF HEALTH GEOGRAPHY 1

- 1.1 History of Health Geography 1
- 1.2 What is Health Geography? 4
- 1.3 Importance of Health Geography 6
- 1.4 Challenges to Health Geography 7

CHAPTER 2. HEALTH: CONCEPTS AND SCOPE 9

- 2.1 Health: Definitions 9
- 2.2 Determinants of Health and Health Promotion 16
- 2.3 Role of Health Geography in Contemporary Health Care Delivery and Health Promotion 25

CHAPTER 3. THEORIES AND MODELS IN HEALTH GEOGRAPHY 27

- 3.1 Introduction 27
- 3.2 Demographic and Ecological Transitions and Development Model 27
- 3.3 Causes, Transmission, and Spread of Disease Models 35
- 3.4 Disease Prevention and Health Promotion Models 47
- 3.5 Geographical Models of Disease Transmission and Spread 53

CHAPTER 4. DISEASES/MORBIDITY AND HEALTH 63

- 4.1 Definition of Disease/Morbidity and Health 63
- 4.2 Nature and Patterns of Disease Occurrence 64
- 4.3 Types of Diseases 64
- 4.4 Spatial Distribution of Diseases: Causes, Control Measures, and Socioeconomic Impact 71
- 4.5 Disease Burden 100

CHAPTER 5. ENVIRONMENT, DISEASES, AND HEALTH INTERRELATIONSHIPS 105

5.1 Introduction 105

- 5.2 Physical Environment 106
- 5.3 Social Environment 115

CHAPTER 6. GLOBAL ENVIRONMENTAL CHANGE, DISEASES, AND HEALTH INTERRELATIONSHIPS 119

6.1 Introduction 119

6.2 Biodiversity Loss 120

CHAPTER 7. EPIDEMIOLOGY 125

- 7.1 Definition and Nature of Epidemiology 125
- 7.2 History and Epidemiological Paradigms 126
- 7.3 Types of Studies in Epidemiology 130
- 7.4 Errors, Confounding, and Causation in Epidemiology 143

CHAPTER 8. HEALTH CARE DISPARITIES AND INEQUALITIES 147

- 8.1 Definitions: Disparity and Inequality 147
- 8.2 Concepts: Health Disparity and Health Care Disparity 148
- 8.3 Health Care and Health Care Classifications 149
- 8.4 Types of Health Care Disparities and Inequalities 152
- 8.5 Barriers to Health Care Provision and Accessibility in Developed and Developing Countries 155

CHAPTER 9. HEALTH STATISTICS 163

- 9.1 Definitions and Concepts 163
- 9.2 Vital Statistics 164



- **CHAPTER 1.** Nature and Scope of Health Geography 1
- **CHAPTER 2.** Health: Concepts and Scope 9
- **CHAPTER 3.** Theories and Models in Health Geography 27
- **CHAPTER 4.** Diseases/Morbidity and Health 63
- **CHAPTER 5.** Environment, Diseases, and Health Interrelationships 105
- **CHAPTER 6.** Global Environmental Change, Diseases, and Health Interrelationships 119
- **CHAPTER 7.** Epidemiology 125
- **CHAPTER 8.** Health Care Disparities and Inequalities 147
- **CHAPTER 9.** Health Statistics 163
- **CHAPTER 10.** Application of Crowdsourced Data in Health Geography Research 179
- **CHAPTER 11.** Geographic Information Systems (GIS) and Spatial Analysis in Health Geography 185
- **CHAPTER 12.** Health and Disease Mapping in GIS with ArcMap: Laboratory Exercises 191





CHAPTER 1. NATURE AND SCOPE OF HEALTH GEOGRAPHY 1

- 1.1 History of Health Geography 1
- 1.2 What is Health Geography? 4
- 1.3 Importance of Health Geography 6
- 1.4 Challenges to Health Geography 7

CHAPTER 2. HEALTH: CONCEPTS AND SCOPE 9

- 2.1 Health: Definitions 9
- 2.2 Determinants of Health and Health Promotion 16
- 2.3 Role of Health Geography in Contemporary Health Care Delivery and Health Promotion 25

CHAPTER 3. THEORIES AND MODELS IN HEALTH GEOGRAPHY 27

- 3.1 Introduction 27
- 3.2 Demographic and Ecological Transitions and Development Model 27
- 3.3 Causes, Transmission, and Spread of Disease Models 35
- 3.4 Disease Prevention and Health Promotion Models 47
- 3.5 Geographical Models of Disease Transmission and Spread 53

CHAPTER 4. DISEASES/MORBIDITY AND HEALTH 63

- 4.1 Definition of Disease/Morbidity and Health 63
- 4.2 Nature and Patterns of Disease Occurrence 64
- 4.3 Types of Diseases 64
- 4.4 Spatial Distribution of Diseases: Causes, Control Measures, and Socioeconomic Impact 71
- 4.5 Disease Burden 100

CHAPTER 5. ENVIRONMENT, DISEASES, AND HEALTH INTERRELATIONSHIPS 105

5.1 Introduction 105

- 5.2 Physical Environment 106
- 5.3 Social Environment 115

CHAPTER 6. GLOBAL ENVIRONMENTAL CHANGE, DISEASES, AND HEALTH INTERRELATIONSHIPS 119

6.1 Introduction 119

6.2 Biodiversity Loss 120

CHAPTER 7. EPIDEMIOLOGY 125

- 7.1 Definition and Nature of Epidemiology 125
- 7.2 History and Epidemiological Paradigms 126
- 7.3 Types of Studies in Epidemiology 130
- 7.4 Errors, Confounding, and Causation in Epidemiology 143

CHAPTER 8. HEALTH CARE DISPARITIES AND INEQUALITIES 147

- 8.1 Definitions: Disparity and Inequality 147
- 8.2 Concepts: Health Disparity and Health Care Disparity 148
- 8.3 Health Care and Health Care Classifications 149
- 8.4 Types of Health Care Disparities and Inequalities 152
- 8.5 Barriers to Health Care Provision and Accessibility in Developed and Developing Countries 155

CHAPTER 9. HEALTH STATISTICS 163

- 9.1 Definitions and Concepts 163
- 9.2 Vital Statistics 164

9.3 Health Statistics as a Statistical Measurement Tool/Technique 1649.4 Health Statistics as a Source of Data/Information 164

CHAPTER 10. APPLICATION OF CROWDSOURCED DATA IN HEALTH GEOGRAPHY RESEARCH 179

10.1 Definitions and Concepts 179

10.2 Crowdsourced Geographic Information Sources 180

10.3 Applications of Crowdsourced Geographic Information 181

10.4 Limits of Crowdsourced Data 183

CHAPTER 11. GEOGRAPHIC INFORMATION SYSTEMS (GIS) AND SPATIAL ANALYSIS IN HEALTH GEOGRAPHY 185

11.1 Definitions and Concepts 185

11.2 The role of GIS in Research in Health Geography 185

11.3 Types of Geospatial Data Acquisition and Analysis Techniques in GIS 186

11.4 Application of GIS Techniques in Health Geography Research 187

CHAPTER 12. HEALTH AND DISEASE MAPPING IN GIS WITH ARCMAP: LABORATORY EXERCISES 191

12.1 Introduction 19112.2 GIS Mapping with ArcMap/ArcGIS 191

REFERENCES 213

INDEX 237

9.3 Health Statistics as a Statistical Measurement Tool/Technique 1649.4 Health Statistics as a Source of Data/Information 164

CHAPTER 10. APPLICATION OF CROWDSOURCED DATA IN HEALTH GEOGRAPHY RESEARCH 179

10.1 Definitions and Concepts 179

10.2 Crowdsourced Geographic Information Sources 180

10.3 Applications of Crowdsourced Geographic Information 181

10.4 Limits of Crowdsourced Data 183

CHAPTER 11. GEOGRAPHIC INFORMATION SYSTEMS (GIS) AND SPATIAL ANALYSIS IN HEALTH GEOGRAPHY 185

11.1 Definitions and Concepts 185

11.2 The role of GIS in Research in Health Geography 185

11.3 Types of Geospatial Data Acquisition and Analysis Techniques in GIS 186

11.4 Application of GIS Techniques in Health Geography Research 187

CHAPTER 12. HEALTH AND DISEASE MAPPING IN GIS WITH ARCMAP: LABORATORY EXERCISES 191

12.1 Introduction 19112.2 GIS Mapping with ArcMap/ArcGIS 191

REFERENCES 213

INDEX 237