

## MEDICAL GEOGRAPHY

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### **Summary**

Medical geography is well recognized as a sub-discipline within geography. Its traditional focus is on the geography of diseases and medical resources. In recent years, medical geography has been recast as health geography where the new emphasis is on the geography of health and health care. In this article, we review the major themes of medical and health geography. Within the section on medical geography, the emphasis is placed on the role that regional variation, cultural ecology and spatial modeling play in examining the geography of disease and the geography of medical resources. In the section on health geography, the emphasis is on the recasting of medical geography as health geography. In recasting medical geography as health geography, the linkages between health and the environment; health and place; and health, health care and public policy. The penultimate section of the article is devoted to methodological developments in medical geography. It emphasizes the growing importance of geographical information systems, spatial statistics, telehealth and qualitative methods.

## 1. Introduction

Medical geography has evolved from a sub-discipline within geography narrowly focused on the spatial distribution of diseases and medical care resources to a sub-discipline that has broadened to take into account changing philosophies, methodologies and topics in geography, medicine and public health as they have evolved in the latter part of the 20<sup>th</sup> century and the beginning of the 21<sup>st</sup> century. Of increasing importance as well are renewed interests within medical geography in the links between health and the environment, health and place, and health, health care and public policy in both developed and developing countries. A third trend is the growing role that new information technologies are playing in medical geography.

The article is divided into three major sections and various subsections. The first section focuses on the two traditional themes of medical geography: the geography of disease and the geography of medical care resources. In the second section, medical geography is recast as health geography within the second section, the foci are: the transition from medical geography to health geography; linking health and the environment; linking health and place; and health, health care and public policy. The third section focuses on recent methodological developments in medical/health geography. We conclude the article by suggesting some future directions medical/health geography is likely to take.

## 2. Medical Geography

While some current text books on medical geography trace its origins to notions of the links between health and the environment as old as philosophic speculation and others begin their discussion of medical geography with the mapping of disease outbreaks in the 19<sup>th</sup> century, we take as our starting point the growth of medical geography as a sub-discipline within university geography in the 1960s. During its early development as a sub-discipline within geography, medical geography reflected the dominant theoretical and methodological approaches that existed across geography at the time: regional geography; cultural ecology; and spatial modeling.

### 2.1. The Geography of Disease

At its very essence, the development of the geography of disease as a major theme in medical geography began with the mapping of morbidity and mortality rates linked to specific diseases at various geographic scales. Mapping a specific disease, whether it was comparing local areas within a region, regions within a country, country to country or groupings of countries allowed the pioneers of medical geography to speculate about how regional differences explained the geographic variations in a disease (see Figure 1). While the mapping of morbidity and mortality remains to this day the first step in any examination of the geography of disease or the geography of health (see below), what evolved out of the early stages of modern medical geography were explanations based on cultural ecology and spatial modeling.

Those who took up the challenges of developing the geography of disease tradition based on cultural ecology and spatial modeling were heavily influenced by parallel developments taking place in epidemiology and public health. In particular,

improvements in the quantity and quality of morbidity and mortality data, geographic coverage and statistical methods encouraged medical geographers to seek explanations for the spatial variability of specific diseases. The recognition of the growing importance of public health encouraged medical geographers to seek an understanding of diseases that had significant impacts on populations in both developing and developed countries that expressed themselves within the interplay of the physical and social environment in which they exist. There was also the challenge of distancing medical geography from the trap of environmental determinism.

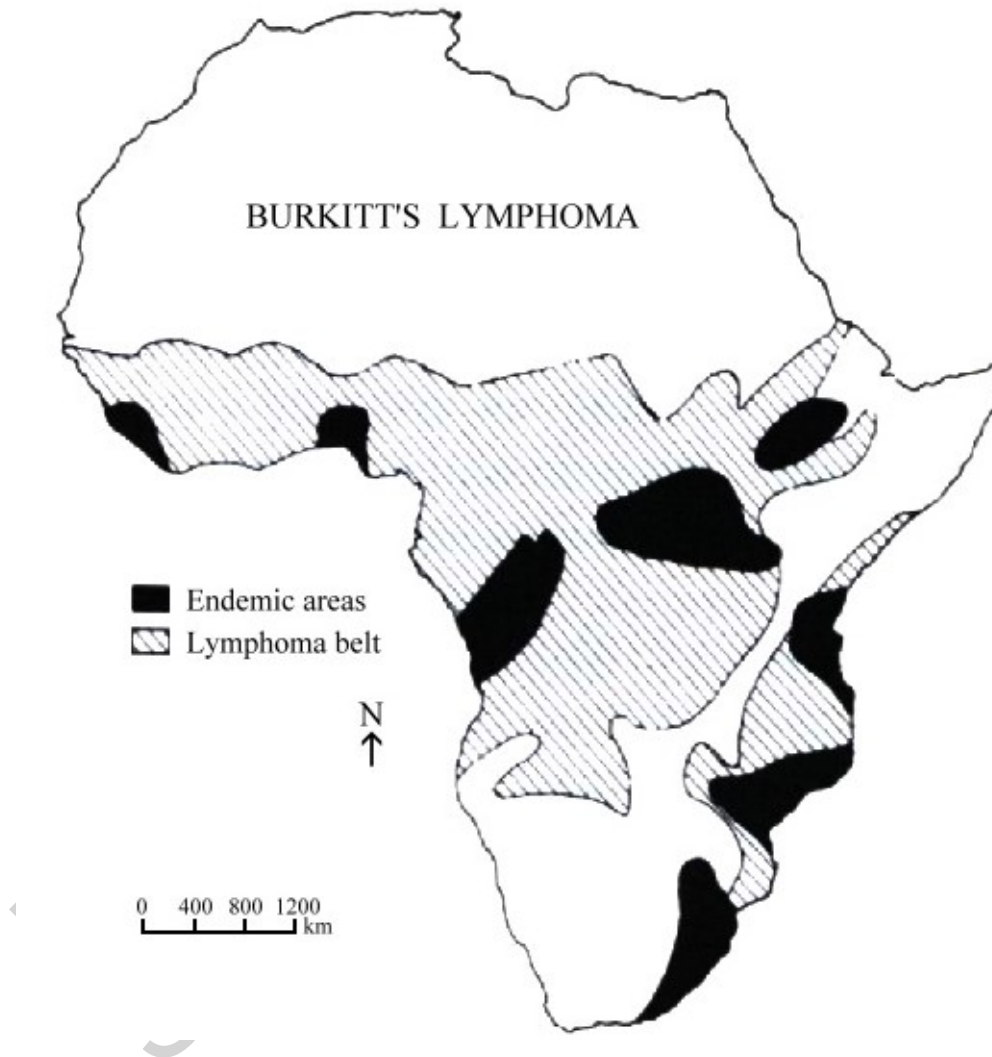


Figure 1: Generalized Lymphoma Belt identified in Africa with endemic areas. *Source: Adapted from Pyle, G.F. (1979) Applied Medical Geography, New York: John Wiley and Sons, p. 84.*

In taking up a cultural ecology approach, medical geographers sought to understand the geography of diseases as the interplay of the demographic and biological characteristics of the human population under attack from a disease, the natural and social habitat within which the disease and the human population exist and the behavior (i.e., the customs, norms, social and economic life) of the human population. Studies were

carried out that covered diseases as diverse as *ascariasis* to *geophagy* in places as diverse as the People’s Republic of China and southern United States (see Figure 2).

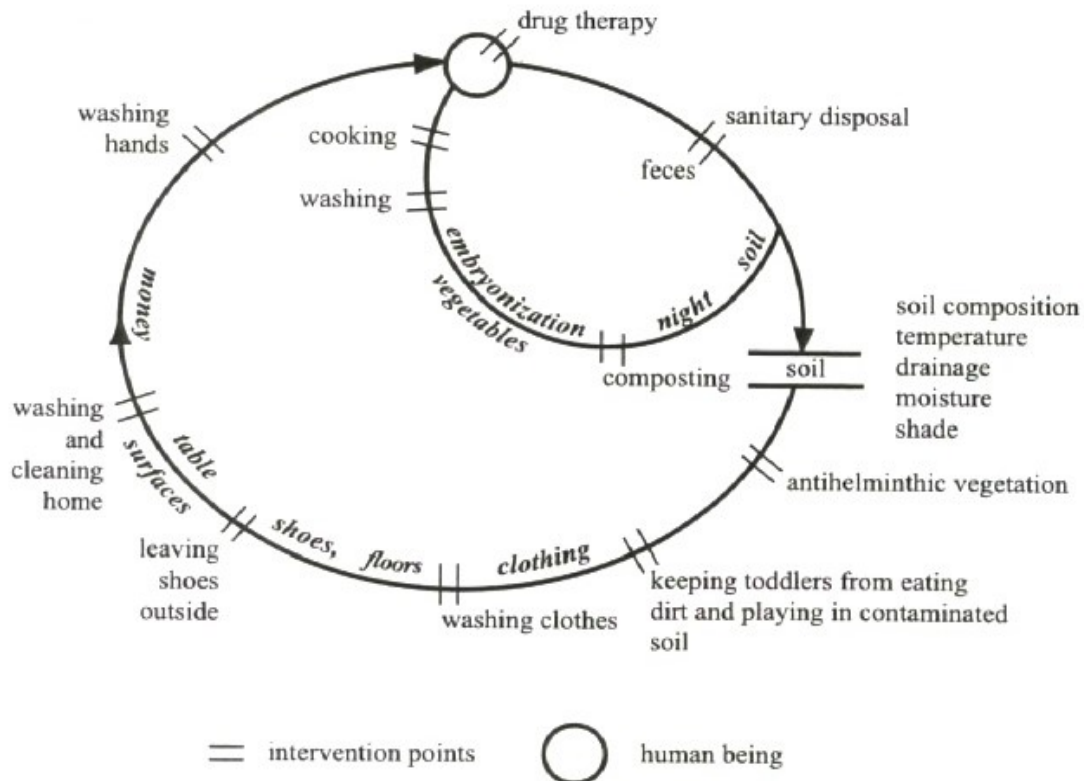


Figure 2: The ecology of *ascariasis*. Source: Meade, M.S. and Earickson, R.J. (2000) *Medical Geography, Second Edition, New York: The Guilford Press, p. 38.*

With the growing interest in statistics in geography, a third approach adopted in the geography of disease relied increasingly on the statistical modeling of the spatial distribution of diseases and their diffusion in time and space.

With increasingly detailed epidemiological data and rapidly improving computing power, medical geographers have contributed to the spatial modeling of everything from Hodgkins disease at the local level to the spread of measles at the regional level to space-time modeling of pandemics (e.g., influenza) at the global level.

The geography of disease, as a part of medical geography, remains as important today as it was in the 1960s. Among those who trace their roots to cultural ecology, there are some who now argue for a geography of health and health care based on the “new cultural geography” Out of the statistical modeling tradition, medical geographers continue to contribute to the development of spatial statistics and the spatial modeling of diseases and are at the forefront of exploiting the potential of geographical information systems (GIS) as ways of understanding the changing geographic distribution of diseases and their underlying human and physical correlates.

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### **Biographical Sketches**

**David R Phillips** (BScEcon, PhD, Wales) is Professor of Social Policy, Head of the Department of Politics and Sociology and Associate Director of the Asia-Pacific Institute of Ageing Studies (APIAS) at Lingnan University, Hong Kong. His research and teaching interests are in health, health care and social epidemiology, with special interests in social gerontology, service and long-term care issues related to demographic ageing. He established the Asia-Pacific Institute of Ageing Studies in 1997 and is founder Co-ordinator of the Asian Ageing Research Network of the Asian Development Research Forum,

sponsored by Canada's International Development Research Centre (IDRC). From 1990-1994, he was Director of the Institute of Population Studies and Reader in Health Studies the University of Exeter and a Non-Executive Director of the Devon Family Health Services Authority. He was Professor of Human Geography (1994-97, Head of Department 1996-97) at the University of Nottingham and Director of its WHO Collaborating Centre for Spatial Health Modeling. He has wide research experience in Asia, Africa and the Caribbean and has held visiting appointments or external examinerships at a number of universities, including the University of Hong Kong, National University of Singapore, University of the West Indies and University of Ulster. He was elected Fellow of the *Academia Europaea* in 1995. He is an advisory editor to *Social Science and Medicine* and *Health and Place*, amongst other journals and Co-editor of the *Hong Kong Journal of Gerontology*. He has published over one hundred papers. His books since 1990 include *Health and Health Care in the Third World* (Longman, 1990); *Ageing in East and Southeast Asia* (Edward Arnold, 1992); *Health and Development* (Routledge, 1994); *Environment and Ageing* (CUPEM, University of Hong Kong, 1999). *Ageing in the Asia-Pacific Region* (Routledge, 2000) and *Ageing and Long-term Care: National Policies in the Asia-Pacific* (ISEAS, Singapore, 2002).

**Mark Rosenberg** was born and grew up in Hamilton, Ontario, Canada. He did his undergraduate degree in geography at the University of Toronto (B.A. Honours, 1975) before going to the London School of Economics and Political Science (LSE) to do his M.Sc. (Geography, 1976) and Ph.D. (Geography, 1980). He has taught at the University of California at Los Angeles (UCLA), the University of Ottawa and Carleton University and worked as a pollster with Angus Reid and a research consultant with J.F. Hickling Management Consultants. In 1985, he joined the Department of Geography at Queen's University and is now a full Professor. In 1999, he received the Canadian Association of Geographers' Award for Service to the Profession of Geography. Recently, he was invited to be a 2001 Visiting Erskine Fellow at the University of Canterbury in Christchurch, New Zealand. During his sabbatical leaves, he has been a visitor in the Departments of Geography at the LSE, the University of Exeter, the University of Nottingham, and the Department of Health Care and Epidemiology and the Institute of Health Promotion Research at the University of British Columbia. He is the Chairperson of the International Geographic Union (IGU) Commission on Health and the Environment, Vice-President of the Canadian Association on Gerontology, Secretary-General of the North American Regional Council of the International Association of Gerontology and Treasurer of the Canadian Federation of Demographers. He also serves as one of the North American Editors of *Environment and Planning C: Government and Policy* and is on the editorial board of *Health and Place*. Dr. Rosenberg is co-author of the book, *Growing Old in Canada: Demographic and Geographic Perspectives*, and author or co-author of over 100 refereed articles, book chapters and scientific and policy papers.

**Kathi Wilson** received her BA and MA from McMaster University (Hamilton, Ontario) and her PhD from Queen's University (Kingston, Ontario). She is an assistant professor in the Department of Geography at the University of Toronto at Mississauga. Her research explores determinants of health for Aboriginal peoples in Canada, and access to health care services within Canada's broadening system of public and private health insurance.