L. Gierl/A. D. Cliff/A.-J. Valleron/
P. Farrington/M. Bull (Eds.)

GEOMED '97

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Proceedings of the International Workshop on Geomedical Systems

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Edited by

Prof. Dr. Lothar Gierl, University of Rostock
Prof. Dr. Andrew D. Cliff, University of Cambridge
Prof. Dr. Alain-Jacques Valleron, Pierre-et-Marie-Curie University, Paris
Dr. Paddy Farrington, PHLS Communicable Disease Surveillance Centre, London
Dipl.-Math. Mathias Bull, University of Rostock

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Professor Lothar Gierl was born in Munich, Germany, in 1942. He has studied communication engineering at the University of Technology of Munich. From 1978 to 1995, he was senior software engineer and lecturer at the computer centre of the University Hospital Großhadern, University of Munich. Since 1995, he is professor and director of the Institute for Medical Informatics and Biometry, University of Rostock.
Fields of Interest: medical information systems, expert systems, case-based reasoning.

Professor Andrew D. Cliff was born in Stamford, England, in 1943. He has held academic posts at the University of Bristol, England (1968 – 1971) and the University of Cambridge since 1972 where he is currently Professor of Theoretical Geography.
Fields of interest: spatial systems analysis, demography, geographical aspects of epidemiology.

Professor Alain-Jacques Valleron was born in Neuilly sur Seine, France, in 1943. He has graduated from Ecole Polytechnique, Paris and from the University of Paris. He is presently Professor of Public Health at the Université Pierre et Marie Curie and Director of a research Unit of INSERM (the French NTH) entitled "Epidemiologie et Sciences de l'Information".
Fields of interest: communicable diseases, iatrogenic risks, modelling in epidemiology.

Dr. Paddy Farrington was born in Paris, France, in 1954. He studied mathematics at the universities of Aberdeen, Oxford and Leeds. A latecomer to statistics, which he took up in 1986 after a few years indulging his other interests, he is currently deputy head of the Statistics Unit at the Public Health Laboratory Service in London, UK.
Fields of interest: statistical modelling, particularly generalised linear models and their extensions, and the applications of statistics to infectious diseases.

Dipl.-Math. Mathias Bull was born in Bad Doberan, Germany, in 1961. From 1981 to 1986, he has studied mathematics at the University of Greifswald.
Fields of interest: intelligent information systems.

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Das Werk einschließlich aller seiner Teile ist urheberrechtlich geschützt. Jede Verwertung außerhalb der engen Grenzen des Urheberrechtsgesetzes ist ohne Zustimmung des Verlages unzulässig und strafbar. Das gilt besonders für Vervielfältigungen, Übersetzungen, Mikroverfilmungen und die Einspeicherung und Verarbeitung in elektronischen Systemen.

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Foreword

A key event in the development of modern epidemiology was the discovery by the English physician, John Snow, that cholera is transmitted by contaminated water. During the cholera epidemic in London in 1854, Snow mapped the locations of cholera deaths, observed a cluster of victims in a particular neighbourhood and found that most of these cases had drunk water from a communal water pump. The handle of the pump was removed at Snow's insistence, and the epidemic ended within a few days.

Since these early days, the science of epidemiology has grown into a major discipline, with many successes to its credit. Many of the diseases which wreaked havoc in the last century have been brought under control, and in the case of smallpox, eliminated, through improvements in hygiene and the use of preventive and control measures such as mass vaccination.

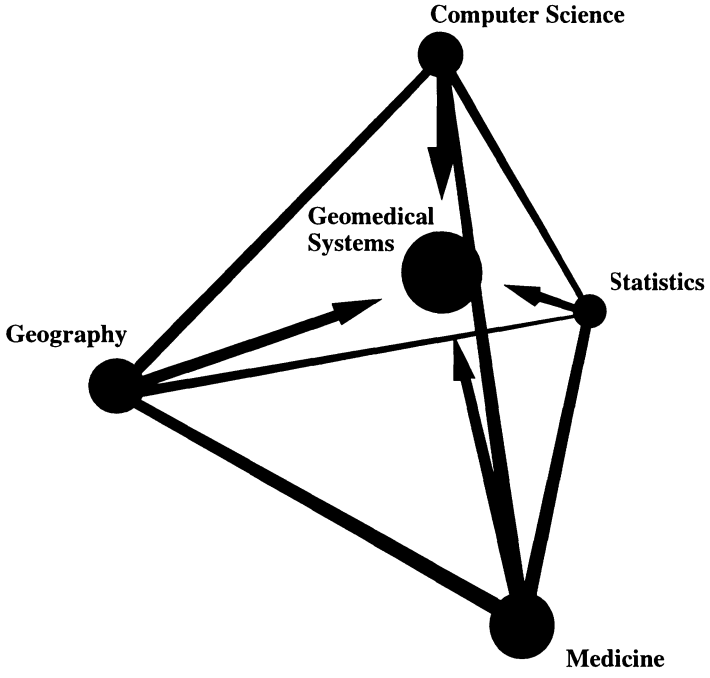
Nevertheless, in recent years, new problems have emerged, and old diseases have re-emerged. Many foodborne and waterborne disease outbreaks go unrecognized or are detected too late for effective control measures to be implemented. New infections, such as HIV, present new threats. Antimicrobial drug resistance, particularly the increase in drug resistant TB, also poses new challenges.

The reasons for the emergence or re-emergence of these new infections are complex. Factors responsible include social changes such as mass population movements, rural-to-urban migration and accelerated urbanisation, population growth, rapid transport, new food technologies, and new life styles, as well as environmental changes which increase the risk of exposure to zoonotic or vector-borne infections, such as altered land use patterns and irrigation.

The multiplicity of factors involved suggests that to confront these problems effectively requires a broad, multidisciplinary approach. Policies to promote practical disease prevention measures must be based on up-to-date information on current health risks as well as on outbreaks and the spread of communicable diseases. In many cases, however, the information systems currently used to monitor human and animal infectious diseases domestically and internationally are inadequate.

Geomedical systems are information systems used to monitor health in geographically-distributed populations. They are used both to detect and to forecast health risks. In recent years, many national and international projects involving such systems have been established, often taking advantage of the wide availability of suitable software. When combined with formal methods of statistical analysis, these new informatics tools can fruitfully be applied to epidemiological problems, including the detection of outbreaks and the visualisation and investigation of disease patterns.

The figure below illustrates the links between geomedical systems, medicine, statistics, geography and computer science.



The primary aim of the GEOMED '97 workshop, which took place in Rostock in September 1997, was to provide a multidisciplinary focus on these issues, with the emphasis on geomedical systems, but also including contributions from the field of epidemiology, geography, and statistics.

The papers in the Proceedings of the GEOMED'97 Workshop present new directions in the field of geomedical systems and explore the interface with related topics such as epidemiology and statistical modelling. We thank all those who contributed to the success of the workshop.

The GEOMED'97 workshop took place from September 4 to September 6, 1997 in the *InterCityHotel* Rostock, whose hospitality we gratefully acknowledge. The Workshop was sponsored by Deutsche Forschungsgemeinschaft (German Science Foundation). The publication of the Proceedings is supported by the Medical Faculty of the University of Rostock, Merck KGaA, Darmstadt, and JANSSEN-CILAG GmbH, Neuss.

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