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GEOMED '97

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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.

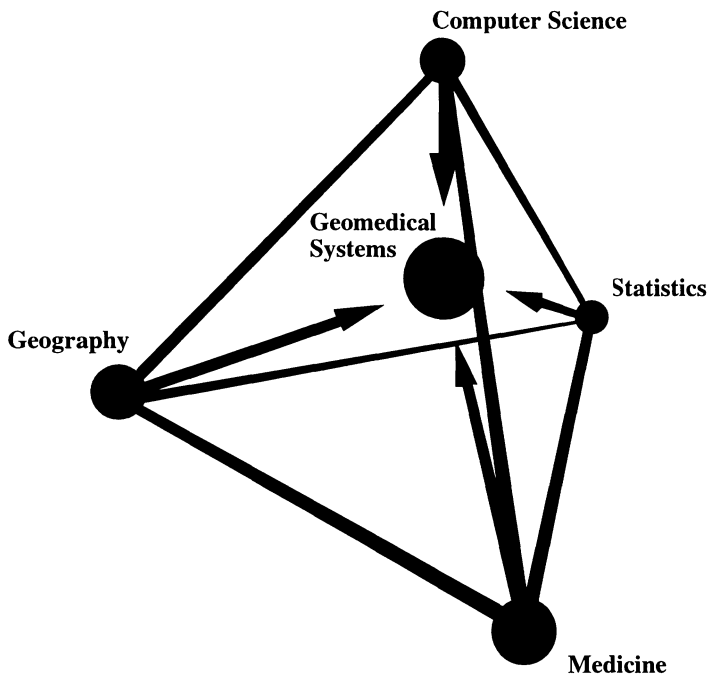
Nevertheless, in recent years, new problems have emerged, and old diseases have re-emerged. Many foodborne and waterborne disease outbreaks go unrecognized or are detected too late for effective control measures to be implemented. New infections, such as HIV, present new threats. Antimicrobial drug resistance, 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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December 1997

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