

Preface

Severe pandemics due to highly-transmissible viruses continue to threaten the world in the twenty-first century. In a tightly interconnected world, infectious disease outbreaks can adversely affect economic growth, trade, tourism, business and industry, and social stability as well as public health. At the same time, noncommunicable diseases have become the main cause of global disability and death, imposing a crushing burden on societies and economies around the world. Public health authorities and researchers now collect data from many sources and analyze these data together to estimate the incidence and prevalence of different health conditions, as well as related risk factors. Modern surveillance systems employ tools and techniques to monitor direct and indirect signals and indicators of disease activities for early detection of outbreaks. Tracking of Internet-based health indicators complements other surveillance methods collecting data from clinical systems and registries. To provide proper alerts and timely response public health officials and researchers systematically gather news, and other reports about suspected disease outbreaks, bioterrorism, and other events of potential international public health concern, from a wide range of formal and informal sources. With the advent of modern communication technologies, many outbreak reports now originate in electronic media and electronic discussion groups. Given the ever-increasing role of the World Wide Web as a source of information in many domains including health care, accessing, managing, and analyzing its content have brought new opportunities and challenges. This is especially the case for nontraditional online resources such as social networks, blogs, news feed, twitter posts, and online communities with the sheer size and ever-increasing growth and change rate of their data. Web applications along with text processing programs are increasingly being used to harness online data and information to discover meaningful patterns identifying emerging health threats. The advances in web science and technology for data management, integration, mining, classification, filtering, and visualization have given rise to a variety of applications representing real time data on epidemics. Also, several public health surveillance tools have been recruited to use web data to detect health crises earlier than official monitoring systems. Some of the main technical and nontechnical challenges in these systems

include: reliability and representativeness of the online data; redundancy and inconsistency of data; generating predictive models; timely and early detection; issues related to verification and evaluation (of the sources (number, and qualities)); and ethics, security and privacy concerns.

This book aims to highlight the latest achievements in epidemiological surveillance and Internet interventions based on monitoring online communications and interactions on the web. It presents the state of the art and the advances in the field of online disease surveillance and intervention. The edited volume contains extended and revised versions of selected papers presented at the International World Wide Web and Population Health Intelligence (W3PHI) workshop series along with some invited chapters and presents an overview of the issues, challenges, and potentials in the field, along with the new research results. The book provides information for a wide range of scientists, researchers, graduate students, industry professionals, national and international public health agencies, and NGOs interested in the theory and practice of computational models of web-based public health intelligence.

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