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Role of biostatistics in public health ppt

Biostatistics Assignment 1 Title: Analysis of Metropolitan Statistical Area (MSA) Data From the Behavioral Risk Factor Surveillance System (BRFSS), 2007 Student is asked to download and analyze one of three BRFSS metropolitan statistical area data files (limited to n=500 each; made available in Excel format) to answer basic statistical questions on HRQOL. This assignment is appropriate for intermediate-level students. Activities Student learns to import data files, examine distribution of key variables, collapse and recode variables, and perform and interpret basic statistical tests (t-test, ANOVA). Materials Included Biostatistics Assignment 2 Title: In-Class Group Discussion of Behavioral Risk Factor Surveillance System (BRFSS), Metropolitan Statistical Area (MSA) Data Analysis Assignment This is a follow-up to assignment 1 consisting of a professor led, in-class discussion regarding the results of the first assignment. This assignment is appropriate for intermediate-level students. Activities Student learns to interpret calculations, discuss meaning in public health terms, and formulate hypotheses to explain HRQOL findings. Materials Included ASPH Competencies Addressed Describe the roles biostatistics serves in the discipline of public health. Apply descriptive techniques commonly used to summarize public health data. Apply common statistical methods for inference. Develop written and oral presentations on the basis of statistical analyses for both public health professionals and educated lay audiences. We are deluged with information and statistics via clinical trials, observational and longitudinal studies, and genomics at any given moment. But it's what we choose to do with this information that makes it valuable in the realm of public health, which is why biostatisticians and similar professionals skilled in the art of biostatistics and informatics are in such high demand. Both biostatistics and informatics involve translating data into meaningful information that can then be used to make logical and beneficial public health decisions. What is Biostatistics?Biostatistics is the branch of statistics responsible for interpreting the scientific data that is generated in the health sciences, including the public health sphere. It is the responsibility of biostatisticians and other experts to consider the variables in subjects (in public health, subjects are usually patients, communities, or populations), to understand them, and to make sense of different sources of variation.In essence, the goal of biostatistics is to disentangle the data received and make valid inferences that can be used to solve problems in public health. Biostatistics uses the application of statistical methods to conduct research in the areas of biology, public health, and medicine. Many times, experts in biostatistics collaborate with other scientists and researchers.Biostatistics has made major contributions to our understanding of countless public health issues, such as:Chronic diseasesCancerHuman growth and developmentThe relationship between genetics and the environmentAIDSEnvironmental health (the impact and monitoring of)Biostatistics is integral to the advancement of knowledge, not only in public health policy, but also in biology, health policy, clinical medicine, health economics, genomics, proteomics, and a number of other disciplines.The Role of Biostatisticians Biostatisticians are said to be the specialists of data evaluation, as it is their expertise that allows them to take complex, mathematical findings of clinical trials and research-related data and translate them into valuable information that is used to make public health decisions. The work of biostatisticians is also required in government agencies and legislative offices, where research is often used to influence change at the policy-making level.In short, these professionals use mathematics to enhance science and bridge the gap between theory and practice.Biostatisticians are required to develop statistical methods for clinical trials, observational studies, longitudinal studies, and genomics:Clinical trials: Studying the evaluation of treatments, screening, and prevention methods in populationsEpidemiological: Studying the causes and origins of disease in humansHuman Genetics: Studying the genetic differences associated with diseases and disease statesGenomics: Studying the biological activity of genes as they relate to diseases and treatmentsSpatial Studies: Studying the geographical distribution of disease/risk factorsAlthough the work of these scientists is complex, their responsibilities include:Designing and conducting experiments related to health, emergency management, and safetyCollecting and analyzing data to improve current public health programs and identify problems and solutions in the public health sectorInterpreting the results of their findingsThe validity of their research results depends on how well they can make meaningful generalizations and how well they can reproduce and apply experimental methods.What is Informatics?Informatics, which is actually an emerging field, is also known as bioinformatics, a science that relies on the basic disciplines of science, mathematics, probability and statistics, and computer science to build a solid statistical foundation for making advances, improvements, and even breakthroughs in public health and medicine.Health informatics is often said to meet at the intersection of information science, computer science, and healthcare, as it deals with the resources, devices, and methods required for the effective storage, use, and retrieval of information, while public health informatics includes the application of informatics in public health areas, such as surveillance, prevention, preparedness, and health promotion. Public health informatics focuses on information and technology issues from the perspective of groups of individuals.Naturally, health informatics tools would include computers, making systems analysts important members of public health informatics research teams. It is the responsibility of expert informaticists to systematically apply information, computer science, and technology into research, learning, and the practice of public health.The Role of Systems Analysts in InformaticsSystems analysts are called upon to write and troubleshoot the software used by biostatisticians and researchers. Their work may also include conducting their own research, designing databases, and developing algorithms for processing and analyzing information.The main responsibilities of systems analysts in biostatistics and informatics include:Incorporating bioinformatics/biostatistics into efficient and automated data analysis toolsDeveloping and tracking quality workflow metrics for detecting variants and sequencesWorking with scientists and researchers to develop project plansSpecializing the Master of Public Health (MPH) in Biostatistics and InformaticsBiostatisticians often complete their undergraduate degree in math or biology, while systems analysts often complete their undergraduate studies in a computer science program that is focused on bioinformatics and scientific computing.Because a master's degree is the minimum requirement in many clinical, academic, and governmental research positions, many professionals in biostatistics and informatics choose to pursue graduate work through the completion of a Master of Public Health (MPH) degree.The Master of Public Health (MPH) has long been the gold standard for professionals in the public health sector, as many public health schools offer MPH specializations in biostatistics and/or informatics.MPH programs are typically broken down by:Public health courses, which include the major disciplines of the field, including:Community health sciencesEnvironmental and occupational health sciencesEpidemiologyBiostatisticsPrinciples of public health managementCourses in the MPH specialtyA field practicum: Often includes working with an approved organization or agencyA capstone projectMaster of Public Health in InformaticsThe MPH in Informatics teaches students how to design, develop, and manage public health information systems.An MPH in Informatics prepares students by providing them with:The principles of public health and public health informaticsThe definitions and standards of health dataStructure and uses of public health databases and networksApplications of the basic functions and operations of public health information technologiesStrategies for developing or adapting public health-related information systemsPlanning and managing objectives and standards for public health information systems projectsThe uses of public health informatics applications, public geographic information systems, and data miningSome of the courses taken in an MPH in Informatics program include:Health information and decision support systemsDevelopment of public health surveillance information systemsLegal and ethical issues in public health informaticsPublic health information systems evaluation and project managementWeb-based public health information systemsGeographic information systems applications in public healthData mining applications in public healthMaster of Public Health in BiostatisticsA Master of Public Health in Biostatistics is designed for students who want to focus their graduate work on biostatistics and analysis. Students in this MPH graduate program are exposed to a variety of statistical methods and their applications in public health. Coursework and the subsequent capstone project are typically focused on designing, collecting, managing, analyzing, interpreting, and presenting data.Graduates of an MPH in Biostatistics program are prepared to:Specify and produce valid study designsPerform database management and produce working tables and statistical summariesAnalyze data in terms of stated hypothesesGenerate new hypothesesProperly interpret study resultsCoursework in an MPH in Biostatistics includes:Applied biostatisticsDatabase design and managementStatistical consultingApplied survival and longitudinal analysisDesign of clinical trialsAnalytical epidemiologyStatistical theoryResearch methods in epidemiologyBack to Top

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