



Biomedical Informatics *and* Its Role In Health Care

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Biomedical informatics is an emerging field and virtually serves as the intersection of three branches of study: health care, information technology, and biomedical engineering. It is a broad term and goes by many names, including clinical informatics, health informatics, medical informatics, etc. Biomedical informatics utilizes technology at three different levels. Under its umbrella are bioinformatics, medical/clinical informatics and public health informatics. Bioinformatics utilizes information technology at the molecular and cellular level and has been used by researchers extensively in protein modeling, genome mapping and drug design. Medical/clinical informatics is focused on the individual patient level and one of its greatest achievements has been in the development, implementation and maintenance/safeguard of the electronic health record (EHR) systems. Public health informatics, the most macro of them all, uses informatics at the population level. Public health informatics aims to help improve the practice of public health through epidemiologic/disease surveillance, tracking systems and consumer informatics.

Our nation's current health care system is facing uncontrolled cost and compromised patient safety: \$2.6 trillion is invested annually in the health care system. According to a study released in November 2011 by the Economic Cooperation and Development (OECD), "Americans pay more than \$7,900 per person for health care each year—far more than any other OECD country—but still die earlier than their peers in the industrialized world." There is also a lack of or under-utilization of health information technology (HIT) applications in our health care system. When President Barack H. Obama took over as commander in chief, he knew the severity of the country's health care situation. He did not hesitate to follow through on the 2004 executive order, laid out by former President George W. Bush, strongly encouraging that all patient health records nationwide become standardized and electronic by 2014. Under President Obama, the American Recovery and Reinvestment Act of 2009 included billions of dollars in HIT spending towards reducing medical errors, increasing efficiency, lowering health care costs, and improving the quality of health care. To accomplish this, the United States federal government has established an incentive program, called the EHR Meaningful Use, in order to overcome the obstacles that prevent health care organizations from utilizing the available health information technologies, and help rectify the overall health care issues. The program is managed by the Centers for Medicare and Medicaid Services (www.cms.gov).

The meaningful use program provides financial incentives to eligible health care providers that successfully achieve the meaningful use of EHR. The program has three main components: the use of a certified EHR in a meaningful manner, such as e-prescribing; the use of certified EHR technology for electronic exchange of health information

to improve quality of health care; and the use of certified EHR technology to submit clinical quality and other measures. Eligible health care professionals and hospitals are highly encouraged, and also offered financial incentives, to implement these components.

For eligible health care professionals, the payment and the schedule depend on the nature of service, Medicare or Medicaid. Medicare-eligible professionals must successfully demonstrate meaningful use for each year of participation in the program. For calendar years 2011–2016, eligible Medicare professionals who demonstrate meaningful use of certified EHR technology can receive up to \$44,000 over five years. Medicaid-eligible professionals also have to successfully demonstrate meaningful use for each year of participation in the program. For calendar years 2011–2021, Medicaid participants can receive up to \$63,750 over six years. It is important to highlight that both Medicare and Medicaid professionals who participate lately in the program will receive lower incentive payments.

Eligible hospitals that adopt and successfully demonstrate meaningful use of certified EHR technology can begin receiving incentive payments for any year starting from 2011 through 2015 for Medicare hospitals, and until 2016 for Medicaid hospitals. The incentive payment is based on a number of factors and begins with a \$2 million base payment.

Incorporation of patient electronic health records, decision support systems, and computerized physician order entry for medications can go a long way in potentially lowering health care costs and improving health care quality. For these reasons, the need for properly trained and educated biomedical informatics professionals is becoming increasingly vital.

The United States Department of Labor, Bureau of Labor Statistics (www.bls.gov) reports that 50 percent of the fastest growing occupations are health care-related, and in a 2010 survey conducted by Modern Healthcare, nearly 50 percent of the executives of health care organizations that were interviewed cited lack of available HIT professionals as a major cause of difficulty in job recruitment (www.himss.org). It is no wonder that biomedical informatics training programs are on the rise amongst universities and colleges nationally. According to the American Medical Informatics Association (www.amia.org), there are over 50 higher education institutions that offer a graduate degree or a certificate program in the field. More recently, the study of biomedical informatics is being offered as a major to students at the undergraduate level. The need for individuals who are specialized in the field, along with trends that are taking place in the health care sector, have contributed significantly towards the growth of the discipline.

Individuals that have certifications and/or degrees in biomedical informatics can choose from a number of career opportunities. The exact type of informatics position an individual will take up will ultimately depend on his/her background. Those coming from a health care setting like medicine or nursing are more likely to use their expertise in roles such as chief medical/nursing information officers, clinical data managers, clinical systems analysts, consultants, or researchers. Those who do not possess health care backgrounds are more likely to work as educators/trainers, developers, principal solution architects, project supervisors/managers, or quality support analysts. Employment opportunities exist in all sectors of the workforce, including hospitals, health systems, eHealth companies, pharmaceutical and insurance companies, and academic institutions. Salaries and benefits of health care information technology are also quite lucrative. According to simplyhired, the average annual salary for health informatics jobs in 2011 was \$69,000. It could, however, go up to \$220,000, depending on factors such as degrees/certifications obtained, level of position acquired in field, geographic location, number of years of work experience, and nature and size of the facility.

Biomedical informatics is a fast-paced and perpetually evolving discipline that is making a significant positive difference in health care. Those involved in it often come from diverse backgrounds such as medicine, pharmacy, nursing, veterinary medicine, dentistry, information technology, business and education. Motivated and intelligent professionals who want to learn how to use the technology have

tremendous opportunities to be on the cutting edge of this particular aspect of the health care spectrum. ★



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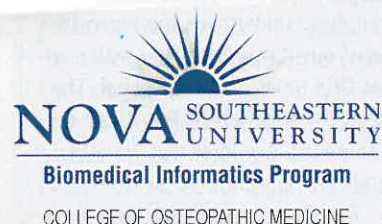
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