



WICHE



A Closer Look at Healthcare Workforce Needs in the West

Health Information Technology

Healthcare Information Technology Workforce Needs

Moving Healthcare in a New Direction

With significant, industrywide advancements in health information technology (IT), institutions of higher education in the West will be called upon to provide a new generation of health IT graduates. New academic programs must be developed, existing programs will need to be retooled, and student recruitment strategies will be required to meet the health IT workforce demands of the future.

Recognized worldwide for its technological advancements, the U.S. healthcare industry still relies upon antiquated paper-record systems to manage patient demographics, clinical data, billing information, and medical claims data. According to President George Bush:

Our doctors and nurses have to manage 21st century medical technology and complex medical information with 19th century tools. America's medical professionals set the standard for the world. It is a testament to their skill that they are able to achieve high-quality care in this antiquated system ... an outdated, paper-based system.¹

The healthcare industry is struggling to move to a modern, electronic-based system, and health information technology (health IT) professionals trained to manage healthcare data and information will play important roles in this transformation. While little quantitative research has been conducted to estimate the demand for health IT professionals, experts in the field suggest that demand will far exceed supply. A rising emphasis on IT throughout the healthcare industry will sharply increase the demand for trained IT professionals, while a diminishing supply of computer science graduates and an aging workforce will be complicating factors.

Healthcare in the U.S. represents the largest single employment industry and accounts for an estimated \$2 trillion in annual spending (16 percent of the U.S. Gross Domestic Product).² In 2005, total national health expenditures rose 6.9 percent – roughly two times the rate of inflation. U.S. healthcare spending is expected to increase at similar levels for the next

decade, reaching \$4 trillion by 2015, or 20 percent of the GDP.³

Factors Driving Health IT

According to a 2000 report published by the Institute of Medicine (IOM), “More people die in a given year as a result of medical errors than from motor vehicle accidents, breast cancer, or AIDS.”⁴ The IOM report estimates that between 44,000 and 98,000 Americans die each year as a result of medical errors. Alarmed by this and other reports calling for transformations in healthcare quality and efficiency, the U.S. Congress and the president are now taking steps to assure that all Americans receive high-quality care in a more efficient and effective healthcare system. The answer, in part, lies in the ability of the U.S. healthcare industry to rapidly and broadly adopt information technology at all levels of healthcare. Eventually, an interconnected and interoperable national health information network (NHIN) will be developed that can quickly and efficiently exchange health data whenever and wherever the data is needed.

Benefits of Health Information Technology

Health IT facilitates the management of medical data and information, as well as its secure exchange between healthcare consumers and providers. Broadly implemented, health IT will improve healthcare quality; prevent medical errors; reduce healthcare costs; increase administrative efficiencies; decrease paperwork; and expand access to affordable care.

Electronic Health Records (EHRs), which relate to functions such as e-prescribing, computerized provider order entry, automated reporting of test results, and clinical documentation, are at the foundation of a national electronic health system. While healthcare providers recognize the benefits of implementing EHRs, the national adoption rate of EHRs remains low. According to a 2006 report from the Centers for Disease Control's National Center for Health Statistics, less than one quarter of the nation's physicians (23.9 percent) reported using full or partial electronic health records (EHRs) in their office-based practice and just one in 10 physicians (9.3 percent) use fully functioning EHRs.⁵

Managing New Technology

Healthcare consumers are now beginning to reap the benefits of advancements in care made possible through the implementation of health IT. Health professionals are increasingly using new IT systems and tools that aid in measuring and providing higher-quality care. Electronic health records (EHRs) are dramatically improving clinical care. Integrated laboratory, pharmacy, and radiology IT systems provide for the seamless exchange of clinical data. Healthcare efficiency and productivity are also improving through the implementation of nonclinical applications, such as bar-coding technologies, radio frequency identification, patient ID tracking, supply chain management, pharmaceutical administration and tracking, and integrated billing systems. Advancements in telemedicine, designed to provide higher-quality care to millions of Americans living in rural locations, requires a significant investment in IT infrastructure and staffing.

Health IT is rapidly changing the landscape of the modern healthcare system. Providers, payers, hospitals, public health entities, and consumers are all benefiting from the opportunities presented through the adoption of IT. At the heart of this health IT transformation will be professionals trained to plan, evaluate, procure, implement, and maintain these myriad health IT systems.

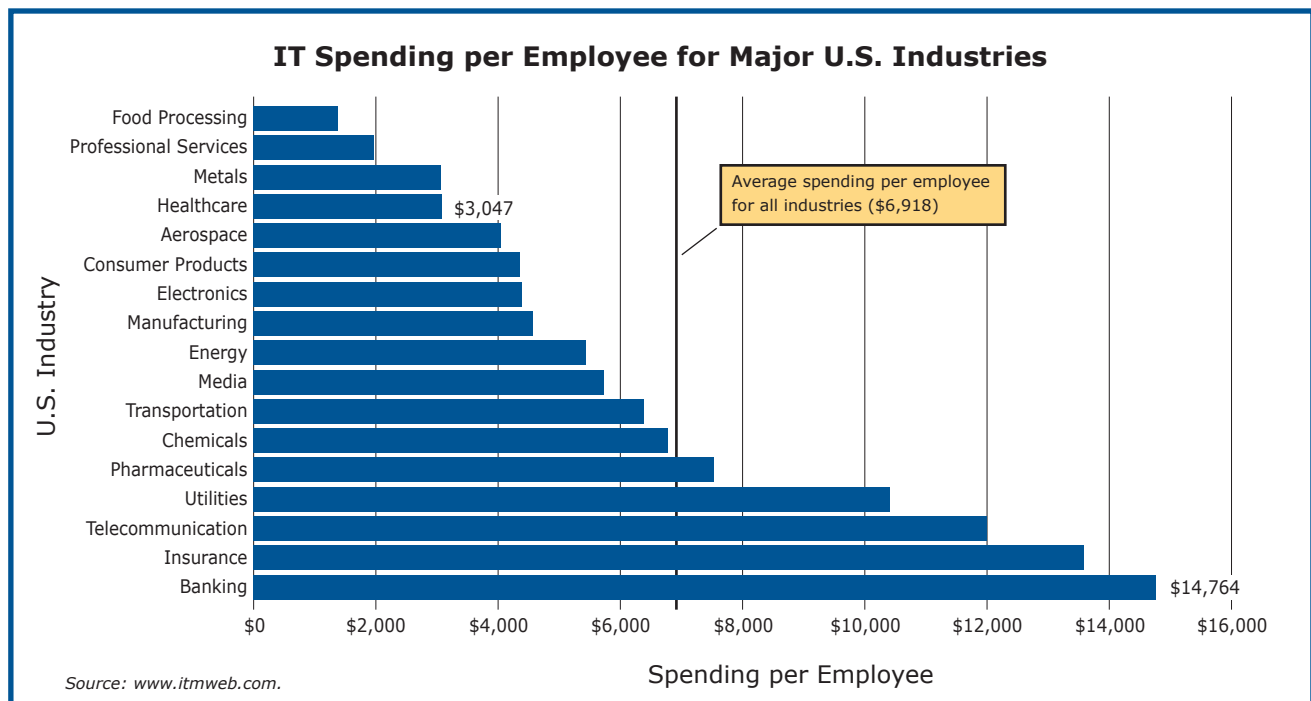
Healthcare Industry Lags in IT

While industries such as banking, utilities, insurance, and telecommunications have made significant investments in information technology in recent decades, the U.S. healthcare industry has historically spent substantially less on information technology than most other major industries. In 2005, the average IT spending per employee for all major U.S. industries was \$6,918 while the healthcare industry spent an average of just \$3,047 per employee.⁶

Despite the evidence that health IT has the power to transform healthcare, studies have found that widespread use remains low among consumers, physicians, rural hospitals, and other healthcare providers.

Expanding Career Opportunities

According to the Bureau of Labor Statistics' *Occupational Outlook Handbook 2006-07*, 18 of the top 20 fastest-growing occupations between 2004 and 2014 will be in healthcare- and computer science-related professions.⁷ For example, employment of medical records and health information technicians and computer support specialists is expected to grow faster than the average for all occupations through 2014. Similarly, employment of health information management workers is expected to grow by 49 percent nationally through 2010. In 2005, Charles



Safran, past president of the American Medical Informatics Association, advocated that we need at least one physician and nurse at all 6,000 hospitals in the U.S. to guide HIT implementation.⁸

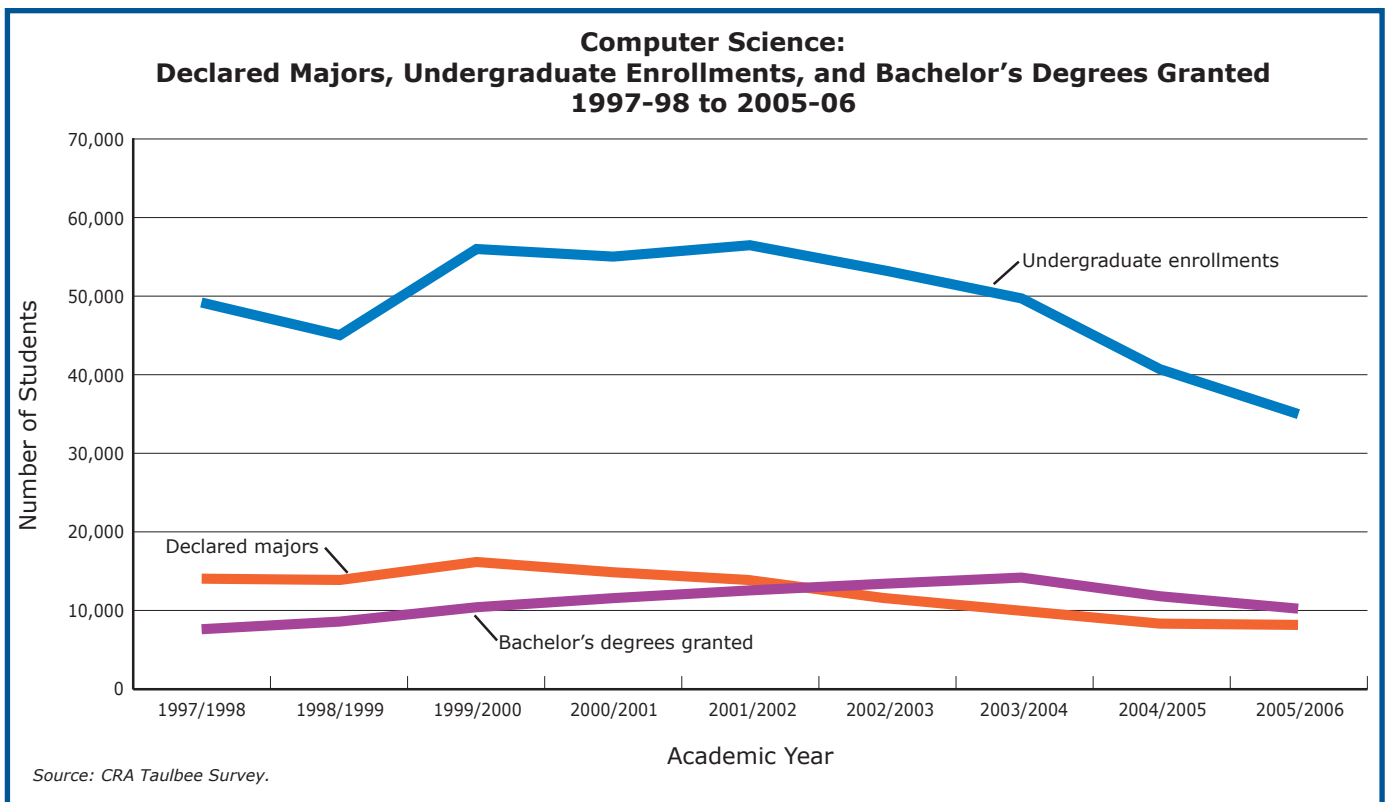
Professional entry into these growth occupations typically will require undergraduate training, ranging from one-semester certificate programs to baccalaureate degree programs. Medical records professionals can enter the workforce directly with limited IT training, while health information management and healthcare informatics professionals will require a thorough understanding of healthcare, project management, and, increasingly, solid IT skills. Graduate opportunities in medical informatics, bioinformatics, clinical informatics, public health informatics, and nursing informatics offer more specialized training.

Declines in Computer Science Enrollments

While unprecedented growth is occurring in health information technology professions, declines in computer science undergraduate enrollments nationally are expected to result in a distinct gap between supply and demand for health IT occupations.

U.S. healthcare organizations have hired extensively from computer science (CS) and IT degree programs across the nation and will now be competing with all other industries for fewer and fewer CS graduates. Over the past five years, both the number of currently enrolled undergraduate students and the supply of graduates from CS programs have been diminishing. According to the Computer Research Association, the number of new computer science majors at doctorate-granting institutions dropped to 7,952 in fall 2005 from 15,958 in fall 2000 – a 50 percent decline.⁹ Similarly, undergraduate enrollment in computer science programs dropped 27 percent between 2001 and 2004, and the total number of baccalaureate degrees granted in computer science peaked in 2003 and fell 17 percent between academic years 2003-2004 and 2004-2005. The percentage of incoming undergraduates indicating that they would major in computer science declined by more than 60 percent between fall 2000 and fall 2004; it is now 70 percent lower than its peak in the early 1980s.

Alarming, the proportion of women who are choosing to major in computer science has fallen to levels not seen since the 1970s. And according to a



recent *USA Today* report, women now make up 56 percent of all U.S. undergraduate students.¹⁰

Microsoft Chairman Bill Gates warned Congress in March 2007 that the ability of the U.S. “to remain a technology powerhouse” is in jeopardy and that the U.S. “cannot possibly sustain an economy founded on technology preeminence” if it does not have enough workers in these areas.¹¹

Aging Baby Boomers

Projected shortages of trained health IT professionals will compound as those at the top tier of the labor pool (baby boomers) begin to retire. According to the Society for Information Management, which examined the combined effects of radically dropping enrollment in IT programs at the undergraduate level and the first wave of baby boomer retirements, “Between the retirements that are coming and the reduction in computer science students, we’re in a very difficult position.”¹²

HIT Workforce Initiatives

Professional associations like the American Medical Informatics Association (AMIA) and the American Health Information Management Association (AHIMA) are developing programs to address national health IT workforce needs. Other national organizations, committees, and healthcare leaders are beginning to work together to develop federal legislation directed at health IT workforce issues.

Federal Legislation

Federal legislation has been introduced to ensure a workforce capable of innovating, implementing, and using health communications and information technology. Legislation proposed by Congressman David Wu (D-OR) would authorize the National Science Foundation to award grants to higher education institutions to develop and offer educational and training programs for healthcare workers and professionals in applied health and medical informatics.

Professional Health IT Training

According to Don E. Detmer, AMIA president and CEO:

Virtually every hospital, clinic, physician office, or other healthcare provider organization will in some way utilize information technology solutions in the coming years and will need healthcare professionals versed in informatics to assist with the implementation, use, and success of these systems.¹³

To meet that need, AMIA has developed its *10x10 Program*, with a goal to train 10,000 healthcare professionals in applied health and medical informatics by the year 2010.

In recent years AHIMA has also addressed workforce issues by advancing an agenda for electronic health information management, creating a virtual educational laboratory to provide training for students and developing a framework for education that encompasses the new roles required by the electronic workplace.

A National Health IT Workforce Study

Recognizing that very limited data are available to quantify the supply and demand for health IT professionals, the Health IT Access Network for Rural and Underserved Populations has agreed upon a consensus statement calling for the development of a national study of the health IT workforce. This nationwide, industrywide study would quantify the current staffing levels for health IT; future staffing needs; existing health IT professional development training and degree programs; and, new professional training and degree programs required to meet the demand. This committee is currently seeking funding and support for the national study.

Higher Education Response

New health IT tools such as EHRs will begin to diminish the need for medical coders, billers, and transcriptionists. Since these professionals make up the largest percentage of the total U.S. health IT graduate population each year, colleges and universities will have to modify their existing degrees and begin to add new degrees to meet the future needs of the IT-enabled healthcare industry. New applied undergraduate degrees in informatics (healthcare informatics, bioinformatics, medical informatics, and nursing informatics) will be part of the broad solution to the future health IT workforce.

Health IT Training Programs in WICHE and Non-WICHE States

The table below presents data from a preliminary analysis of health IT degree programs in the U.S. from both WICHE and non-WICHE states. Findings from the analysis show that:

- ◆ 718 health IT degree programs are available in the U.S., with 125 programs (17 percent) in WICHE states and 593 programs (83 percent) in non-WICHE states.
- ◆ Of the 8,266 health IT degrees granted, only 1,308 (16 percent) were in WICHE states, compared to 6,958 (84 percent) in non-WICHE states.
- ◆ Females make up approximately 90 percent of students enrolled in health IT programs nationwide.
- ◆ The majority of degree programs are available at the certificate (54.9 percent) or associate (31.8 percent) levels, with fewer programs available at the bachelor's (9.1 percent), master's (3.7 percent), and doctorate (.5 percent) levels.

Health IT Graduates in WICHE and Non-WICHE States: 2006 Completions Data

Degree Description:	Certificate		Associate		Bachelor's		Master's		Doctorate		Total Degrees Granted
	WICHE States	Non-WICHE States	WICHE States	Non-WICHE States	WICHE States	Non-WICHE States	WICHE States	Non-WICHE States	WICHE States	Non-WICHE States	
Bioinformatics/Medical Informatics	0	0	1	0	46	110	32	245	8	26	468
Health Information/Medical Records Administration/Administrator	254	1,237	34	173	56	537	6	16	0	0	2,313
Health Information/Medical Records Technology/Technician	556	2,491	301	2,123	0	0	8	0	6	0	5,485
Total Degrees Granted in 2006	810	3,728	336	2,296	102	647	46	261	14	26	8,266

Source: National Center for Education Statistics (NCES), Integrated Postsecondary Education Data System (IPEDS), 2006 Completions Survey.

Endnotes:

- ¹ The White House, *Promoting Innovation and Competitiveness – Transforming Health Care: The President's Health Information Technology Plan* (Washington, D.C.: The White House, April 2004), accessed on 1 November 2007 at <http://www.whitehouse.gov/infocus/technology/economic_policy200404/chap3.html>.
- ² National Coalition on Healthcare, *Health Insurance Cost* (Washington, D.C.: National Coalition on Healthcare, 2007), accessed on 1 November 2007 at <<http://www.nchc.org/facts/cost.shtml>>.
- ³ Ibid.
- ⁴ Institute of Medicine, *To Err Is Human: Building a Safer Health System* (Washington, D.C.: Institute of Medicine, National Academy Press, 1999).
- ⁵ Centers for Disease Control, *Media Advisory: More Physicians Using Electronic Medical Records*, 21 July 2006, accessed on 1 November 2007 at <<http://www.cdc.gov/od/oc/media/pressrel/a060721.htm>>.
- ⁶ Information Technology Management Web, *Information Technology Spending Scoreboard: 2006*, accessed on 1 November 2007 at <<http://www.itmweb.com/blbnchspn.htm>>.
- ⁷ U.S. Bureau of Labor Statistics, *Occupational Outlook Handbook 2006-07* (Washington, D.C.: U.S. Bureau of Labor Statistics, 2006).
- ⁸ C. Safran and D.E. Detmer, "Computerized Physician Order Entry Systems and Medication Errors," *Journal of the American Medical Association* 294 (2005), 179.
- ⁹ Computing Research Association, *2005-06 Taulbee Survey* (Washington, D.C.: Computing Research Association, May 2007), accessed on 1 November 2007 at <<http://www.cra.org/statistics/survey/0506.pdf>>.
- ¹⁰ Greg Toppo and Anthony DeBarros, "Women Feed the Jump in College Enrollment," *USA Today*, 12 September 2007.
- ¹¹ Patrick Thibodeau, "Gates Testifies About Declining Enrollments, Research Finding," *Computerworld*, 7 March, 2007.
- ¹² Lauren Gibbons Paul, "IT Staff Shortage Looming," *Network World*, 8 August 2005, accessed on 1 November 2007 at <<http://www.networkworld.com/research/2005/080805-it-shortage.html>>.
- ¹³ American Medical Informatics Association, *AMIA 10x10 Program* (Washington, D.C.: American Medical Informatics Association, 2007), accessed on 1 November 2007 at <http://www.amia.org/10x10/>.

WICHE developed this new series of workforce policy briefs to help higher education entities and policymakers in the Western states share resources and develop a regional response to meet the West's healthcare needs. This issue of *A Closer Look at Health Care Workforce Needs in the West* was prepared by Raymond F. Rogers, CEO of the National Center for Health Care Informatics.

Contacts:

David A. Longanecker, Executive Director
 Jere J. Mock, Senior Program Director, Programs & Services
 Margo Schultz, Program Coordinator, Student Exchange
 Western Interstate Commission for Higher Education (WICHE)
 3035 Center Green Drive • Boulder, CO 80301 • Tel. 303.541.0214
www.wiche.edu/sep

The Western Interstate Commission for Higher Education (WICHE) and its 15 member states work to assure access and excellence in higher education for all citizens of the West. Member states include Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming.