ASSESSING THE PREVALENCE OF AHIMA-IDENTIFIED HEALTH INFORMATICS AND INFORMATION MANAGEMENT CAREERS AND RELATED SKILLS: A CROSS-SECTIONAL STUDY

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Abstract

This study’s objective was to identify the prevalence of the American Health Information Management Association (AHIMA) career map jobs and determine which job categories, degrees, and skills are associated with higher pay. We extracted data from SimplyHired, a major employment website, from December 2018 to December 2019. We retrieved 12,688 career posts. We found differences in average salary by career category (p-value 0.00). Most jobs were in coding and revenue cycle (CRC) and information governance (IG) categories. The highest average salaries were in data analytics (DA) and informatics (IN). Each career category had a unique set of skills associated with the highest paying jobs. Eighty-two percent of CRC, 67 percent of IG, 65 percent of IN, and 83 percent of DA jobs listed in the AHIMA career map were present in the extracted dataset. These results can help employees, academics, and industry leaders understand the health informatics and information management (HIM) workforce landscape.

Keywords: HIIM workforce, job skills, informatics, job salaries, higher education

Introduction

The health informatics and information management (HIM) field has changed dramatically with new jobs, knowledge, and skills required. This makes identification of current jobs challenging. With increased technology and advances in medicine, the necessary skills of managing patient information on paper now require managing patient information electronically. Identifying the skills required of HIM professionals is challenging, as the needs are impacted by a quickly changing healthcare system driven by regulations, standards, guidelines, and compliance with various federal and state mandates. However, the Bureau of Labor Statistics estimates that HIM professionals’ demand will grow 8 percent between 2019 and 2029. Therefore, as the job market changes and the healthcare industry moves toward more automation and increased use information technology to drive decisions and reimbursement, there is a need to continuously evaluate the HIM workforce skillset, job requirements, and job titles.

AHIMA addressed these concerns by re-evaluating its educational strategy, revamping its career map, and charting a new course for the HIM workforce. Bold educational directives were made to ensure the continued vitality of the HIM profession.

The AHIMA career map groups jobs into four domains: coding and revenue cycle, information governance, informatics, and data analytics.
The career map comprises HIM job titles, roles, expected salary, related skills, job descriptions, and domains. AHIMA used AHIMA members, subject-matter experts, and staff to guide the career map development. The map was last updated in 2016.

When studying the job market and identifying current jobs, there are limitations to using the AHIMA career map. These include that existing positions are determined only from jobs and roles of the AHIMA membership and do not include members of the current workforce working in these jobs or related fields. It also does not have frequencies of job titles. Another issue with the AHIMA career map data is the emerging roles in the career map were developed by focus groups and did not reflect actual jobs that may or may not exist in the industry.

As the authors began exploring the origins of the data in the career map, it became apparent that a job-market analysis was required to identify the current jobs available in the healthcare market in the HIM scope of work.

Previous research on the HIM workforce highlights emerging skills and current health information technology (HIT) trends. AHIMA completed a workforce study in 2014 to assess workforce demand, challenges, and needs. Among the top skills reported were analytical, coding, and critical thinking. Furthermore, the future's principle skills would include electronic health record management and privacy and security skills.

Another workforce study outlined the overlap of HIM and HIT roles, which included project management, and privacy and security; while DeAlmeida et al. used data from AHIMA membership profiles to link jobs to STEM technology job titles. Marc et al. studied the U.S. and global trends in HIM job announcements using relevant HIM keywords and identified current job domains. The purpose of our study was to obtain empirical data on current AHIMA job titles listed in SimplyHired. Our study sought to analyze salary trends, top skills, and career prevalence. Our review is the first to map AHIMA job titles to current announcements and report specific job titles. The specific research questions which guided our study are as follows:

1. How prevalent are AHIMA career map jobs, and are there emerging and current positions not represented?
2. Which job categories/degrees and skills are associated with higher pay?
3. What are the differences in skills required by job category?

Methods

The AHIMA career map is divided into four broad categories of HIM jobs: Coding and revenue cycle, information governance, informatics, and data analytics.
In addition, each position is categorized as either "current" or "emerging" to reflect anticipated changes in the workforce. We collected all career data from the AHIMA career map (accessed April 2019) using a Python application. Python is a programming language, and the Python package selenium was used to copy information from the AHIMA website. The following job attributes were retrieved: career category, title, responsibilities, description, skills, responsibilities, training, work experience, and alternate job titles.

We wrote an application in the Scala programming language to run nightly to crawl the SimplyHired website for jobs using "health information management" as a search term. The following job attributes were retrieved from this data extraction, including title, location, company, date posted, minimum salary, maximum salary, responsibilities, description, required/preferred education, benefits, and skills.

References to education-level, benefits, and skills were extracted from job descriptions by SimplyHired. We stored the information retrieved in a PostgreSQL database. SimplyHired aggregates job postings from thousands of other employment websites and job boards and is a good representation of publicly advertised employment opportunities. We accessed jobs from December 12, 2018, to December 16, 2019.

We mapped SimplyHired titles to the AHIMA career map titles by converting the latter into a bag-of-words and matching the former. If a SimplyHired title contained all the words from an AHIMA career map title, it was considered a successful match even if the words were not in the same order, or the SimplyHired job had additional terms. If the AHIMA career map titles had added abbreviations, we removed them (e.g., we removed the abbreviation EHR from electronic health record implementation specialist). In two cases, the title listed alternative words (e.g., director/chief). In that case, we created two separate titles, each with one of the terms.

We aggregated all SimplyHired jobs by AHIMA career category. We displayed the average maximum salary with confidence intervals for job categories, education level, job titles within job categories, and top skills within job categories. We performed the Kolmogorov-Smirnov\textsuperscript{10} normality test on all salary distributions by category. We tested for normality to decide if statistical tests designed for normal distributions could be used. Normality tests, such as Kolmogorov-Smirnov, compare the z-score of the sample (in our case, salary values) to the z-scores of normal distributions with the same mean and standard deviation as the sample. The Kolmogorov-Smirnov test is appropriate for sample sizes >=2000. The null hypothesis for this test is that the distribution is normally distributed. So, a p-value >0.05 would indicate a normal distribution. We used the one-way analysis of means\textsuperscript{11}, which does not assume equal variance, to assess differences in average minimum/maximum salary by category. The one-way analysis of means is a non-parametric test appropriate for non-normal distributions. We provided confidence intervals on proportions for job counts by degree, career category, and job titles within career categories. All visualizations and
statistical tests were performed in R using the following packages: tidyverse, DescTools and rcompanion.

**Results**

Our application retrieved 12,688 postings from SimplyHired that match AHIMA career map HIM careers. The results of our Kolmogorov-Smirnov test indicated that the average maximum salaries by career categories are not normally distributed with p-values <0.05. Our one-way analysis of means for maximum salary by job category showed differences in average salary with a p-value of 0.00. Distribution of jobs from our data into the AHIMA career map categories found 4,943 jobs in coding and revenue cycle; 3,373 jobs in information governance; 2,202 in data analytics; and 2,170 in informatics.

Of the job listings that mention education required/preferred, the distribution showed that 4,482 needed a Bachelor’s degree; 1,964 required a high school diploma or GED; 1,456 required an Associate’s degree; 1,004 required a Master’s degree; and 96 required a Doctoral degree. Eighty-two percent of CRC, 67 percent of I.G., 65 percent of IN, and 83 percent of DA jobs were present in the extracted dataset. The majority of AHIMA jobs not present in the SimplyHired dataset were in the information governance domain, though each category had at least one title not present in our dataset. These job titles can be viewed in Appendix 1.

As seen in Figure 1a, jobs in the DA and IN categories have the highest average salaries. The error bars between these two categories show overlap, indicating that their average salaries in the population may not be different. The error bars for those categories do not overlap with the CRC or IG categories, indicating that the true population averages between DA-IN and CRC-IG are different. Figure 1b shows that SimplyHired jobs referencing master’s degrees have the highest average maximum and minimum salaries. Error bars for the Doctoral degree are the only category that overlap with other jobs. The differences in averages between all other jobs are likely to represent the true population averages. It is important to note that the jobs requiring doctoral degrees are few, which may impact the representativeness of this to the population averages.

As seen in Figure 2a, the most frequent CRC jobs are revenue cycle manager, coding professional, clinical documentation specialist, and medical biller. Medical biller is an entry-level job, and the other two are advanced jobs according to the AHIMA career map. Each of these jobs was listed as current on the AHIMA map as well. The three least frequent jobs are mid-level or advanced jobs, according to the AHIMA map. Each of these jobs is listed as current.

The three most frequent jobs in the DA category are all in the advanced category, and the least frequent job, mapping specialist, is in the mid-level category. The most frequent job in the Information Governance domain, patient registrar, is an entry-level job.

Among the next three top jobs, health information technician and information security officer are
mid-level, and compliance officer is advanced. All these top jobs are listed as current in the career map. Of the top four most frequent jobs in the informatics career category, data application analyst and implementation support analyst are mid-level. Release of information specialist is an entry-level job, and quality improvement analyst is an advanced job. All these jobs are current.

As seen in Figure 3a, Figure 3b, Figure 3c, and Figure 3d, several of the job categories have a significant distribution of average salaries. Average salaries range from below $50,000 to above $150,000 for average maximum salaries.

For CRC jobs, the director of coding (master level) job has the highest average salary and is the only job in this domain with an average max salary above $100,000. Though the error bars are wide, they do not overlap with any other job. These next two jobs with the highest average salaries in that AHIMA category are also frequent jobs, with revenue cycle manager (advanced level) being the most frequent and second highest paying job. Data quality manager (advanced level) is the highest paying and the second most frequent job in the DA domain. The chief technology officer (master level) has the highest salary across all career categories in the informatics category.

However, the wide error bars have overlap with the top jobs in CRC and G. The top three informatics jobs have average maximum salaries above 100,000. Though IG had the second-lowest average salary according to Figure 1a and Figure 1b, it is the only category with four jobs with average maximum salaries at or above $100,000. These jobs’ error bars do not cross over the $100,000 mark, indicating that the true population average for these jobs is above that threshold.

Figure 4a, Figure 4b, Figure 4c, and Figure 4d show the skills associated with top-paying careers in each category. Each category has a unique set of top skills. The top skill in Data Analytics is Hadoop, a big data framework for storage and computing. Software Development Life Cycle (SDLC), is a framework for efficient software development and is the second-highest paying career in that category. Business Intelligence, Python programming language, quality management, and Current Good Manufacturing Practice CGMP are also top skills indicating a preference for workers who have experience with analytics and management of resources and the application of analytics for improved business operations. Other desired skills in this category are related to project and data management and other data analytics skills (XML, data mining, relational databases, etc.). There is an overlap in the top skills between the informatics category and data analytics. The top skill for informatics is business intelligence—which is included in the data analytics list. The next three skills, Oracle, data management, and data warehouse— all relate to databases’ management. Other skills in this category relate to project management (PMP, leadership experience), basic computer science skills (Microsoft Project, I.T. Experience), business administration, visualization(Tableau), specific analytic skills (SQL, Visio, etc.), and particular certifications (Project Management Professional (PMP), and Epic Certification).

The Information Governance (IG) and Clinical Revenue Cycle (CRC) categories’ skillsets only
reference analysis skills and Microsoft products. The top skill for I.G. is COBIT (Control Objectives for Information and Related Technologies) which is a framework for I.T. management and information governance.

Other I.G. top skills include those related to national standards and information security (national institute of standards and technology), CISSP (Certified Information Systems Security Professional), information security, and SANS-GIAC (Global Information Assurance Certification). The rest of the skills in IG reference government legislation such as SOX (Sarbanes-Oxley Act for compliance related to financial reporting), management (risk and project management, organizational skills, public speaking, and leadership experience, etc.), and business management (audits and budgeting). The top skills in Figure 4d for CRC are in management (project management, leadership, conflict management, and negotiation) as well as managed care. Clinical documentation certification and medical insurance are HIM specific skills mentioned.

Although the RHIA and RHIT were not in the list of top 20 skills for any of the categories, RHIA was mentioned in 7 percent (n=876) of career announcements, and RHIT was mentioned in 7 percent (n=843).

Discussion

This study indicates that earning potential increases as educational level increases (Figure 1b). The average salary increases with references to advanced degrees (the Master’s degree average salaries are higher than the baccalaureate degree). Our findings are consistent with other studies, which indicate that learning more yields to earning more.12

Job titles show that there are many jobs available for entry-level professionals in those categories that allow for entry into the HIM workforce. The jobs with higher proportions show there are opportunities for career advancement in the HIM field.

The proportion of jobs for each job title within the four AHIMA categories is critical to investigate future job opportunities or target career advancement. It is important to note that the informatics job category pays more than the other AHIMA job categories. Additionally, we see that many of the jobs listed as emerging the AHIMA Career Map were found in the job search we conducted. Further work is necessary to know whether some of the jobs we did not see in our job search might be there with other job titles.

Our results show that information governance and informatics skills lead to higher-paying average salaries (Figure 4b and Figure 4c). Future students must realize these are the top skills in the respective areas, and from a curriculum standpoint, these skills should be included. Quality management, a skill identified in data analytics, is a core competency within the HIM domain. Data governance skills are essential for jobs in the health informatics and data analytics category. Coding and revenue cycle skills demonstrate a consistent progression from entry to higher critical thinking.
skills.

Overall, the job categories of data analytics and informatics yielded the highest average salaries. Among the degree requirements, the master's degree holders have the highest average salaries. Concerning job skills, project management, leadership, data management, oracle, and business intelligence expertise showed the highest average salaries. Several specialized certifications like Hadoop, COBIT, SAP, Tableau, and Python also had high average salaries. Throughout all job categories and domains, project management and leadership skills were prevalent.

An interesting observation is the number of jobs held by AHIMA members, as reflected on the AHIMA career map, not in the Simply Hired jobs search. Perhaps the job titles are changing and may reflect other job titles found in our investigation of open positions. Some of the job titles are shifting as there are more postings for analysts that might have been more specific titles in the past. It appears that many of the jobs that were not found in our search were jobs with specific titles such as Enterprise Master Patient Index Health Information Exchange Coordinator. These jobs may not exist because the master patient index terminology has changed to patient identity management so that those jobs may exist with different job titles. Another job that did not emerge, the Meaningful Use Specialist, was a very-specific job title based on a federal mandate that has since been changed.

One of the limitations of studying the HIM job market is the variety of job titles in the HIM domain that may not be included in the AHIMA career map. The educational requirements for these positions vary from medical coders to chief information officers. There is also a plethora of credentials available and skills required for the jobs which vary widely over the domain areas. Our future work will include mapping the HIM curriculum skills using the curriculum standards in the AHIMA and AMIA competencies.

Conclusion

The HIM workforce is ever-changing, and HIM professionals play a critical role in and impact the healthcare industry's success. This study's roles and domains demonstrate the variety of skills and job titles represented within the HIM field and their associated pay scales. With such a diversity of jobs and skills, it is essential to stay abreast and aware of industry workforce needs. The need to adapt to changing job demands is critical as there is a wide range of knowledge and skills required. Now is the time for HIM professionals, educators, and other stakeholders to commit to including more specialized resources and expertise in their educational programs to meet the workforce needs today and in the future.

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References


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