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Academic Data Warehouses: Tool for Medical Student Education in Medical Informatics and Population Health

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Abstract

Academic data warehouses are increasingly being used to support health services research and quality assessment initiatives. A less common use of such systems is in support of medical education. As new requirements for health professional competence in medical informatics emerge, data warehouses are a potentially powerful teaching tool for introducing and reinforcing these concepts. The 2nd report of the AAMC Medical Student Objectives Project describes several learning objectives related to medical informatics and population health. At the University of Virginia, we have a decade of experience with a custom-built academic data warehouse; over the past five years we have explored the educational potential of our system. In this abstract, we describe our vision for how data warehouses like our own might be useful for training in these important areas.

Keywords:

database management systems, academic medical centers, medical informatics, medical education

Academic Data Warehouses and the AAMC Medical School Objectives Project Report II

Academic data warehouses typically include a wide variety of clinical, administrative, and financial patient data. Most commonly, data is integrated within a single healthcare organization, though this is not always the case. These systems often include custom-developed user interfaces allowing users to directly query the database. While curricular demands have broadened to include medical informatics and population health, the information infrastructure to support these requirements has lagged. Data warehouses offer students the ability to gain hands-on experience in interacting with clinical databases, potentially serving as a useful tool in handling these new educational requirements.

In 1998, the American Association of Medical Colleges (AAMC) Medical School Objectives Project (MSOP) Report II focused exclusively on medical informatics and population health, outlining a series of learning objectives for medical students organized into five different roles: Life-Long Learner, Clinician, Educator/Communicator, Researcher, and Manager.

Data warehouses and medical education

Like many of the roles described in the MSOP II, the Life-Long Learner role includes several learning objectives that might be readily addressed by hands-on experience with an academic data warehouse. While this role focuses primarily on accessing knowledge sources, the core areas (including information retrieval skills and the ability to filter, evaluate, and reconcile information) could be appropriately addressed by queries into an academic data warehouse. Using such a system would also potentially allow exploration of medical terminologies and coding systems such as ICD9-CM, SNOMED, and LOINC. The learning objectives associated with the role of Researcher, defined broadly to include a range of skills related to data acquisition, management, and analysis, is perfectly suited to the functionality of a an academic data warehouse. Secondary datasets are key resources for clinical investigators, and students can use data warehouses to learn about their strengths and limitations for this purpose. Finally, learning objectives in the Manager role, with their focus on quality assessment and health care service planning, could be addressed by optimizing these tasks in an academic data warehouse, allowing students to look at benchmarking / performance data for practice groups and discuss the myriad issues related to using existing data for this purpose. Specific details for these examples will be included in the poster presentation.

Conclusion

Information systems in academic medical centers have not been optimized to support new competency requirements in undergraduate medical education. Organizations with data warehouses should strongly consider introducing them into the curriculum as potentially invaluable tools for introducing and reinforcing key concepts related to medical informatics and population health. Many of the key learning objects in the AAMC MSOP II could be very productively addressed by access to these systems.