

Structured Data Elements Optimization: Challenges & Mixed-Methods Data Driven Approaches

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Introduction/Background

Electronic Health Records (EHRs) promise to enable information exchange across health systems and serve as a mechanism for contributing to a continuous Learning Health System.[1,2] These goals are directly dependent on semantically interoperable EHR systems that can transmit the meaning of the data in a standard format. Semantically interoperable EHR systems require fully specified and consistent clinical data definitions preferably with terminological references for each structured data element.[3] The work to achieve fully specified and consistent clinical data definitions with terminological references for each structured clinical data element (CDE) is significant and best if done early in the lifecycle of an EHR implementation to prevent inconsistent data capture and misuse. Yet, early in the lifecycle of an EHR implementation is a resource intensive time with few available resources for optimization of CDEs, increasing the challenges inherent in this work. This abstract will outline mixed methods to prioritize clinical topics for optimization of structured data elements using data driven approaches.

Methods

Our team identified resource and prioritization challenges to optimizing CDEs and defined a mixed-methods data driven approach to overcome these challenges. This abstract extends our 10 step approach for a data governance and optimization process that: 1) identifies clinical topics, 2) creates draft reference models, 3) identifies downstream data needs, 4) prioritizes clinical topics, 5) validates reference models, 6) calculates gap analyses of EHR CDEs, 7) communicates validated reference models, 8) requests revisions to EHR CDEs based on gap analysis, 9) evaluates usage of reference models, and 10) monitors for new evidence.[4] We extend this work to describe our mixed-method data driven approach to prioritize clinical topics (step 4) by requiring three criteria are met: 1) high downstream data needs, 2) high usage rates, 3) low consistency in data definitions across EHR system.

Results

In this poster we will describe findings from our mixed methods analyses for 7 clinical topics. We detected a wide variation in usage rates of CDEs across clinical topics. For example in applying our criteria, we found that while Pain Assessment CDEs were used at a lower rate than Skin Alteration and Lung Exam CDEs, Pain Assessment had the most significant downstream data needs and low consistency of CDEs.

Discussion/Conclusion

A lack of resources is a significant challenge to optimizing EHR CDEs early in the implementation lifecycle of an EHR. Challenges to EHR optimization increase overtime as a lack of project resources persist and the complexity of optimizing CDEs that are in a production EHR system with data filed increases. Balancing data from 3 criteria was successful in efficiently identifying high priority clinical topics for optimization in the setting of limited resources.

References

- 1 IOM. Best Care at Lower Cost: The Path to Continuously Learning Health Care in America. 2012. <http://iom.edu/Reports/2012/Best-Care-at-Lower-Cost-The-Path-to-Continuously-Learning-Health-Care-in-America.aspx>
- 2 Payne TH, Corley S, Cullen TA, *et al.* Report of the AMIA EHR-2020 Task Force on the status and future direction of EHRs. *J Am Med Inform Assoc* 2015;**22**:1102–10. doi:10.1093/jamia/ocv066
- 3 Moreno-Conde A, Moner D, Dimas W, *et al.* Clinical information modeling processes for semantic interoperability of electronic health records : systematic review and inductive analysis. *J Am Med Informatics Assoc* 2015;**22**:925–34. doi:10.1093/jamia/ocv008
- 4 Collins S, Gesner E, Morgan S, *et al.* A Practical Approach to Governance and Optimization of Structured Data Elements. In: *MedInfo 2015: 15th World Congress on Health and Biomedical Informatics*. 2015. 5.

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