

The Electronic Support for Public Health (ESP) Project: Automated Detection and Electronic Reporting of Notifiable Diseases

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OBJECTIVE

To leverage electronic medical record (EMR) systems to improve the timeliness, completeness, and clinical detail of notifiable disease reporting.

BACKGROUND

Clinician reporting of notifiable diseases has historically been slow, labor intensive, and incomplete. Manual and electronic laboratory reporting (ELR) systems have increased the timeliness, efficiency, and completeness of notifiable disease reporting but cannot provide full demographic information about patients, integrate an array of pertinent lab tests to yield a diagnosis, describe patient signs and symptoms, pregnancy status, treatment rendered, or differentiate a new diagnosis or from follow-up of a known old diagnosis. EMR systems are a promising resource to combine the timeliness and completeness of ELR systems with the clinical perspective of clinician initiated reporting. We describe an operational system that detects and reports patients with notifiable diseases to the state health department using EMR data.

METHODS

The Electronic medical record Support for Public health (ESP) system detects notifiable diseases by scanning ambulatory encounter data for combinations of laboratory test results, diagnostic codes, medication prescriptions, and vital signs suggestive of target conditions. ESP is configured as an independent data repository populated by daily flat file extracts of comprehensive encounter data received from a clinical practice's EMR [1]. The decoupled architecture offloads computing burden from the source EMR and make facilitates ESP integration with varying EMR products. Security is controlled by placing ESP behind the source practice's firewall. Proprietary and idiosyncratic source EMR codes are translated into universal nomenclature via a user-generated map. When a notifiable case is found, ESP generates an HL7 case report and securely transmits it to the state health department. Case reports include patient and clinician contact information, lab tests, symptoms, treatment, and pregnancy status. ESP has been in-

stalled in Atrius Health, a multi-site, multi-specialty medical practice with over 600 clinicians serving more than 600,000 patients in eastern Massachusetts. Currently, ESP identifies and reports cases of chlamydia, gonorrhea, and pelvic inflammatory disease. Reporting on acute hepatitis A, acute hepatitis B, chronic hepatitis B, acute hepatitis C, Lyme disease, and tuberculosis is scheduled to begin later this year.

RESULTS

ESP has been operational in Atrius Health since January 2007. Since activation, ESP has generated over 800 case reports. The positive predictive value of ESP reports relative to chart review is 100%. Comparison with concurrent, independent manual reporting through April 18, 2007 showed a substantial increase in the number of case reports: 517 versus 370 cases of chlamydia (40% increase) and 64 versus 43 cases of gonorrhea (49% increase). There was also a substantial increase in pelvic inflammatory disease cases (18 versus 0 cases). Treatment information was included on 100% of patients reported by ESP versus 88% of manually reported patients. Pregnancy status was included on 100% of ESP reports versus only 30% of traditional, manual reports. Amongst patients manually reported to the health department, ESP identified 32 missed cases of pregnancy. An additional 14 cases of pregnancy were found amongst patients reported by ESP alone.

CONCLUSIONS

Automated detection and electronic reporting of notifiable diseases using data from EMR systems can substantially increase the completeness and clinical richness of case reports compared to clinician initiated paper-based reporting systems.

REFERENCES

[1] Klompas M, Lazarus R, Daniel J, Haney G, Campion F, Kruskal B, Hou X, DeMaria A, Platt R. Electronic medical record Support for Public health (ESP): automated detection and reporting of statutory notifiable diseases to public health authorities. *Advances in Disease Surveillance*. 2007;3:3.

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