

ASSESSMENT OF A CANADIAN PRIMARY CARE ELECTRONIC MEDICAL RECORD DATABASE FOR USE IN OBSERVATIONAL STUDIES

Frise S^{1,3}, Reidel K², Tarride JE^{1,4}, Corner N², Dziarmaga A¹

BACKGROUND

- Observational data derived from clinical practice is important to answer questions that cannot be addressed by Randomised Clinical Trials.
- Although there are a number of administrative databases in Canada, access to more comprehensive, longitudinal clinical data such as smoking status, body weight and laboratory values in the primary care setting is limited.

OBJECTIVE

- To evaluate a primary care EMR (Electronic Medical Record) system to determine its feasibility for use in observational studies.

METHODS

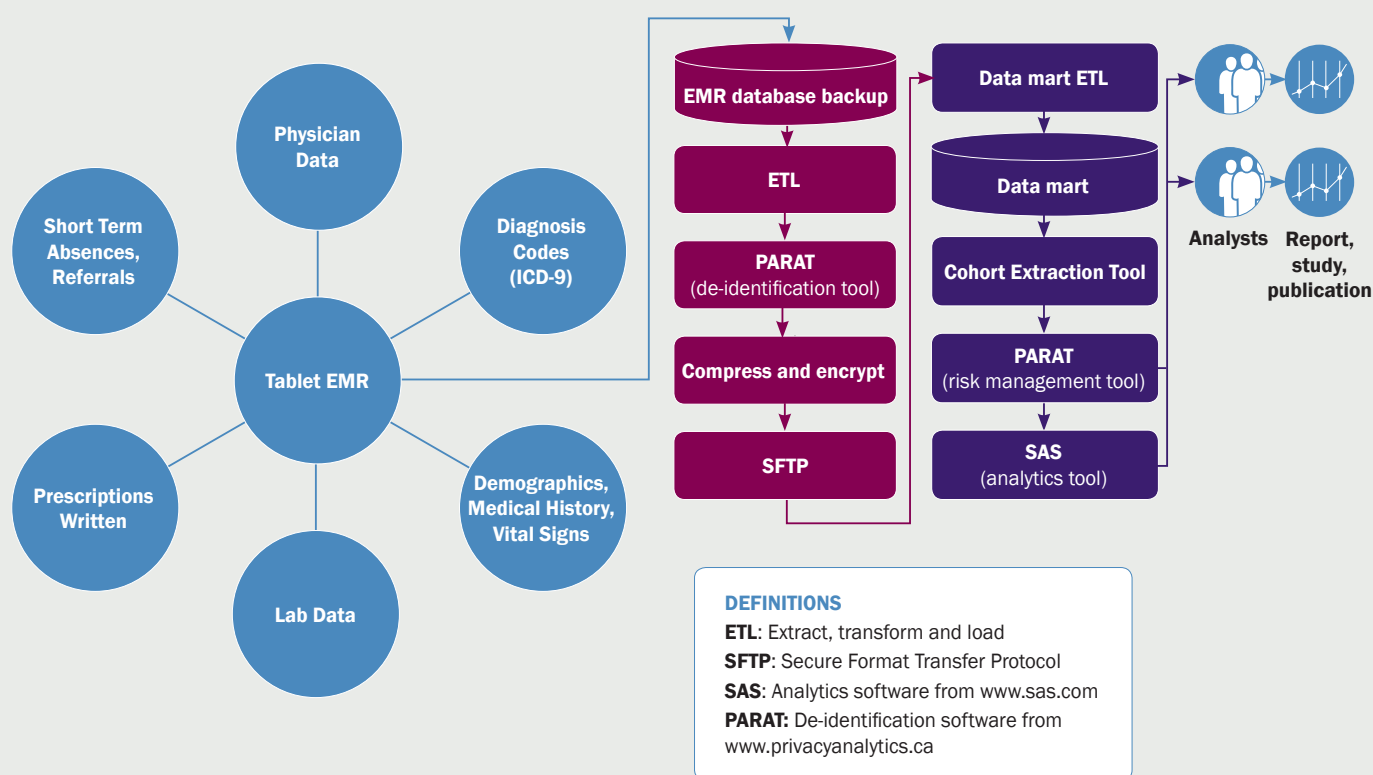
Data Source:

- Primary care EMR database with 2.2 million patient records from Ontario, Canada
- Permission granted for secondary use of data by 152 physicians with support from 345 other Health Care Professionals (HCP)
- Study period: January 1st 2009 to December 31st 2011 with 255,274 active patients
- Figure 1 presents details of the data components and processing

Data Analyses:

- De-identified patient data were used to evaluate the database comprehensiveness and variable completeness
- Patient demographics (age, sex) were compared to Statistics Canada data in order to assess generalisability of the EMR population

Figure 1. Data Components and Processing



¹ AstraZeneca Canada Inc., Mississauga, ON, Canada

² IMS Brogan Canada, Kirkland, QC

³ Dalla Lana School of Public Health, University of Toronto

⁴ Department of Clinical Epidemiology & Biostatistics, McMaster University

RESULTS

- There were 3,019,954 patient visits observed by 255,274 active patients (≥ 1 visit) in the study period (Figure 2).
- Figure 3 presents completeness of data by variable which ranged from 26% for pulse to 100% for age and sex.
- Structured fields were used for 85.6% of written prescriptions, 88% of diagnoses and 94.5% of referrals.
- 100% of lab results received electronically of which 65% are digital (N=4,287,068).
- The age and sex distribution (Figure 4 and 5) is presented compared to the Canadian population. The median age of patients in the EMR was 37.2 years compared to 39.9 years reported by Statistics Canada (July 2011).

Figure 2. Cumulative number of active patients in EMR by year

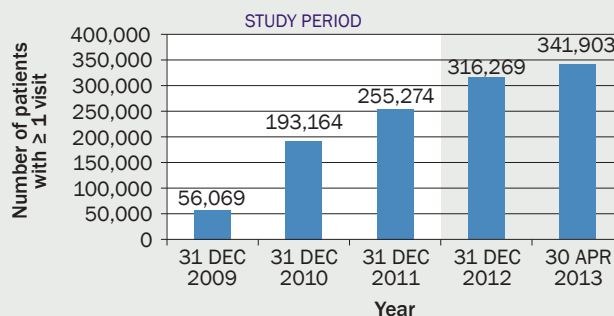
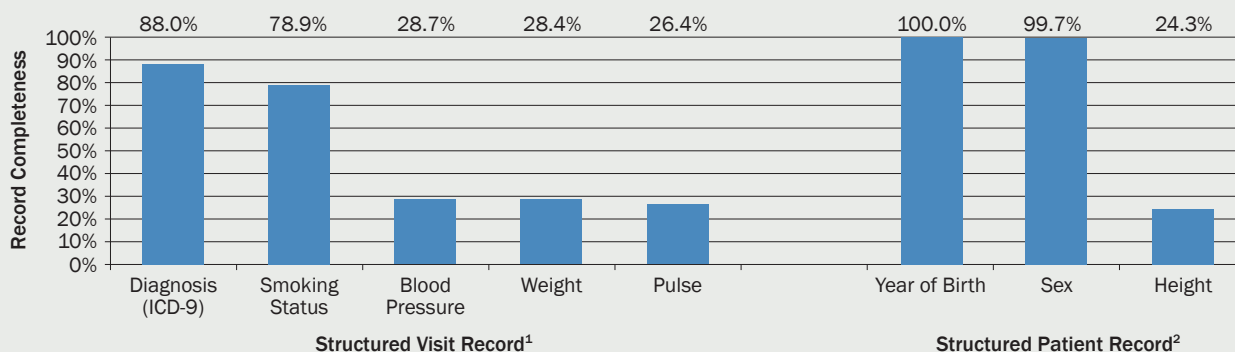


Figure 3. Completeness of Data by Variable

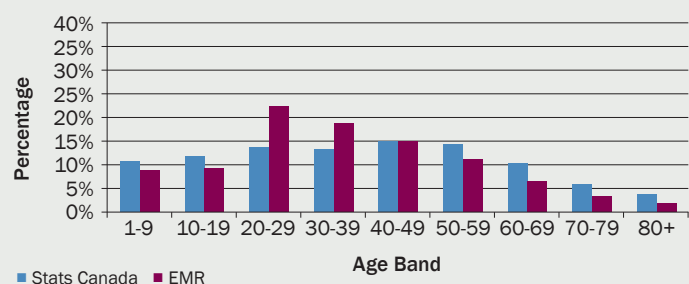


DEFINITIONS:

¹ **Structured Visit Record:** The proportion of 'visit' level records with completed data.

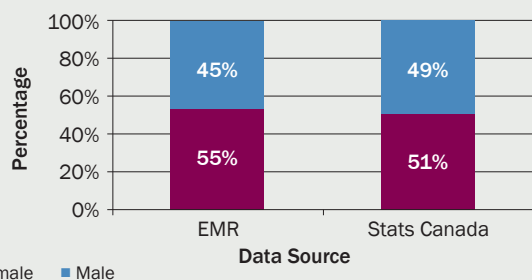
² **Structured Patient Record:** The proportion of 'patient' level records with completed data.

Figure 4. Age Distribution in EMR compared to Statistics Canada*



*Source: Statistics Canada census of population 2011

Figure 5. Sex Distribution in EMR compared to Statistics Canada*



*Source: Statistics Canada census of population 2011

LIMITATIONS AND CONCLUSIONS

- Our initial assessment of this EMR indicates that these data may be used for many types of observational research such as:
 - Descriptive studies examining patient pathways of care
 - Cohort studies comparing the impact of different treatments on clinical and health-system related patient outcomes
 - Case-control studies to identify risk factors related to outcomes of interest
 - Economic impact studies
- The use of a primary care EMR may be limited for the study of some specialty or in-patient hospital treated diseases.
- Overrepresentation of exposure is inherent with collection of written versus dispensed medication use.
- Disease-specific validation studies will be required prior to further analysis. Further research is being undertaken to review quality measures.