



The Development & Application of a Data Quality Measure in an Electronic Medical Record Database

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Acknowledgments

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Background

- Increasing interest in use of EMR data beyond patient care
- High quality data for...
 - Providers
 - EMR Functioning
 - Researchers
 - Decision-makers
- No commonly accepted measure of EMR Data Quality

Study Objectives

- To finalize a measure of data quality for use in an EMR-derived database
- Apply the measure to the EMR Database (DELPHI)
- Report on challenges



Study Population

- Testing conducted on the DELPHI database
 - Data collected from March 2006 to September 2008 (de-identified EMR data)
 - ~28,000 patients from 10 DELPHI group practices
 - Participants use the International Classification of Primary Care to code a sub-set of patient visits

3C Measure of Data Quality

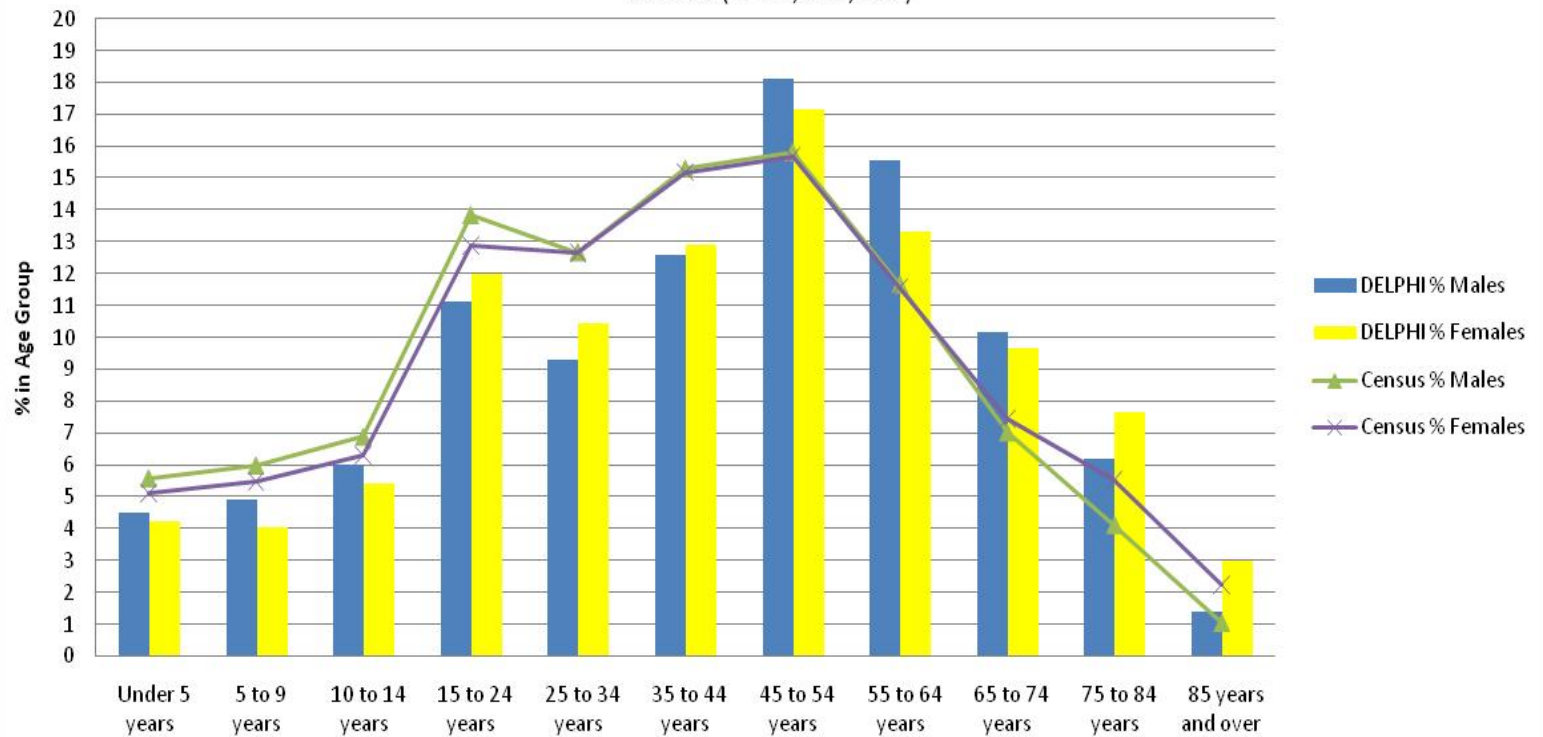
- Comparability
 - DELPHI database and Canadian Census Population
 - ICPC and Non-ICPC Patients (sub-set of DELPHI db)
 - Disease prevalence
- Completeness
 - Sensitivity – diabetes, hypothyroidism, asthma, hypertension
 - Recording – blood pressure, height and weight
- Correctness
 - PPV – diabetes, hypothyroidism, asthma, hypertension
 - Age and sex-specific conditions

Comparability

DELPHI - 2006 Canadian Census

DELPHI (n=28,279)

Census (n=31,612,895)

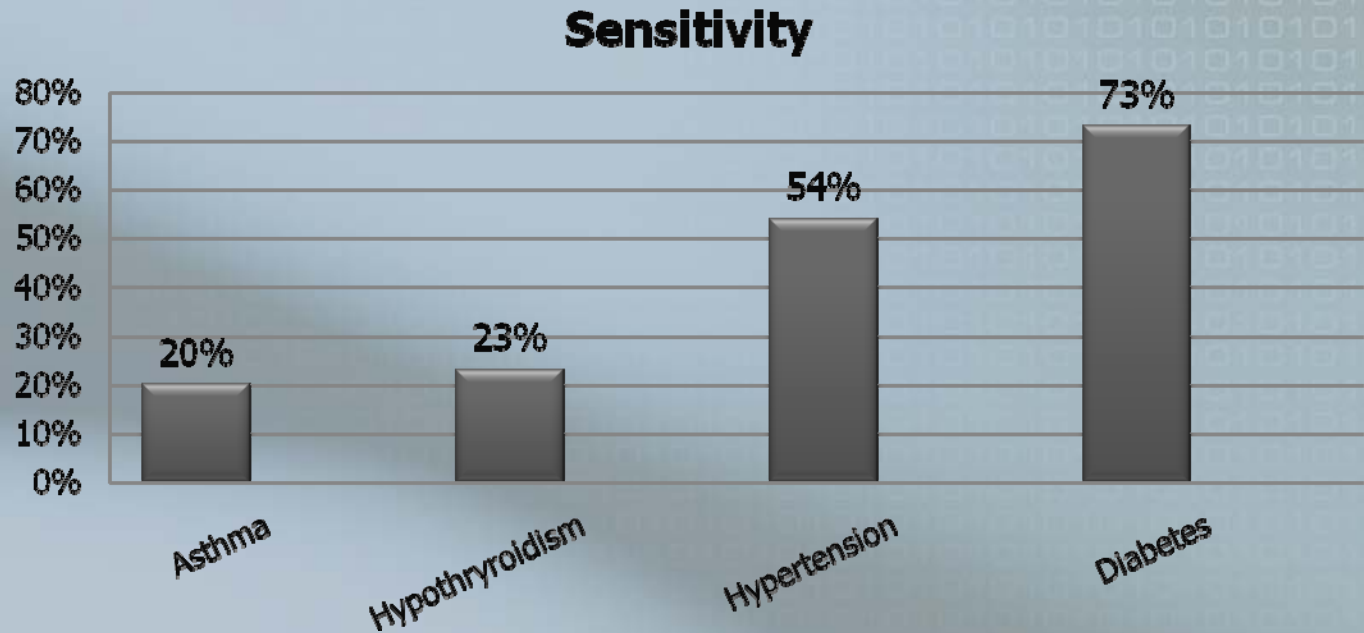


Sensitivity & Positive Predictive Values

Test Conditions: Diabetes, Hypothyroidism, Asthma, Hypertension

Full Database	Gold Standard (e.g. problem list or medications or lab values)	
	Disease Present	Disease Absent
Billing Code Present	A	B
Billing Code Absent	C	D

Completeness



Assessment of Recording

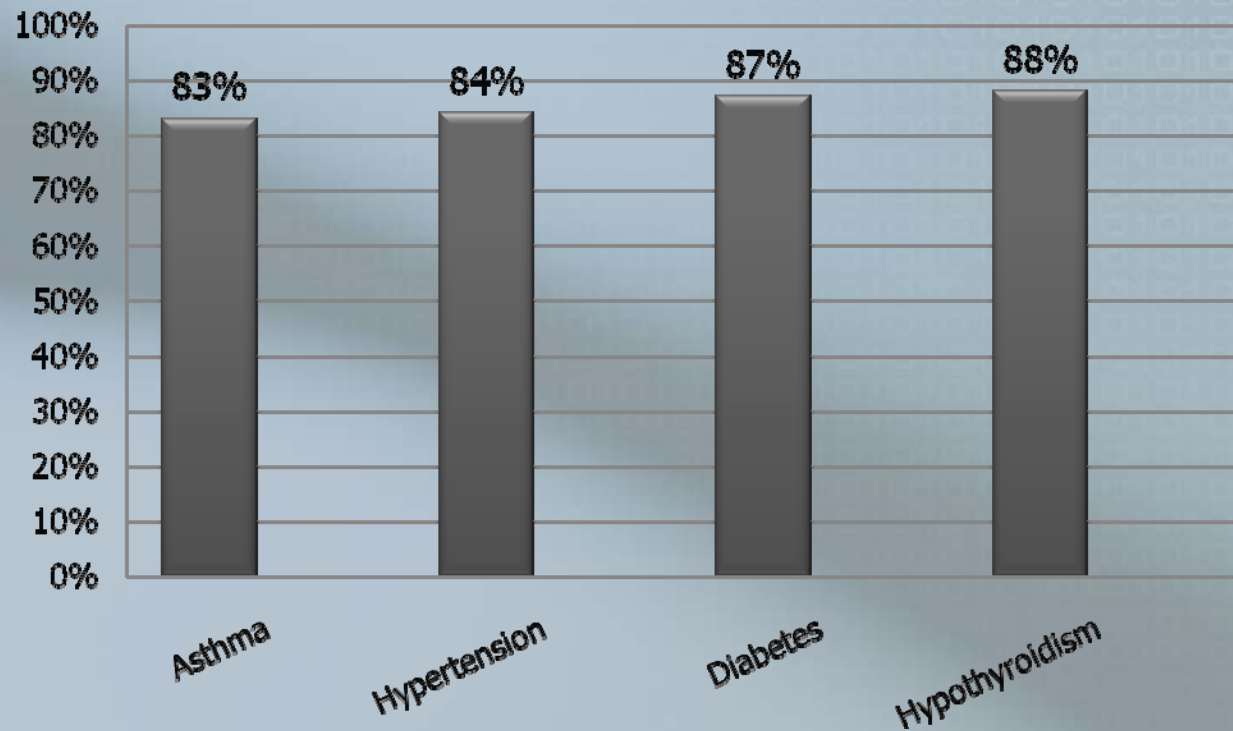
Patients 25-70 yrs N=17,168	Total BP, HT, WT Recorded	% of Total Patients with BP, HT, WT Recorded	Range - % Recording Across Group Practices
Blood Pressure	12,610	74	25-92
Height	6,578	38	11-71
Weight	9,113	53	19-93

Discussion

- Relatively few patient with Asthma and Hypothyroidism with a billing code
- More than half of those with hypertension and diabetes were assigned a billing code
- Fairly similar pattern - ICPC codes
- *Cautions:*
 - Patients may have come in for another primary reason/condition
 - Definitions
- Recording for blood pressure higher than weight or height
- *Cautions:*
 - large range, values could be recorded elsewhere

Correctness

Positive Predictive Value



- Age and sex-specific conditions checks errors = .1% or less

Discussion

- High level of correctness overall, similar pattern with ICPC codes



Challenges

- Gold standard definitions
- No notes or narrative portion of EMR record
- Test conditions – where data were recorded
- Assessing variation in ICPC coding

Conclusions & Policy Implications

- Comparability and correctness very strong, completeness less so
- ↑ interest and use of EMRs for patient care & patient population management
- Secondary uses of these data
- Important to assess EMR data quality & to have tools

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