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# Cross-validation of Drug Use Records in Two Pharmaceutical Databases: A Population-based Study of Alberta's Tomorrow Project Cohort

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## Introduction

Pharmaceutical Information Network (PIN, 2008-now) is a provincial database collecting patients' medication information in Alberta, Canada. Alberta Blue Cross (ABC), the largest health benefit provider in Alberta, has been managing pharmaceutical records for senior patients (65+ years) whose medications are covered by Alberta's government-sponsored health benefit plan since 1970s.

## Objectives and Approach

Over 96% of participants in Alberta's Tomorrow Project (ATP), a province-wide cohort study of cancer and chronic diseases in Canada, consented to data linkage to healthcare databases. To cross-validate medication records in the two pharmaceutical databases in Alberta, individual-level data of ATP participants aged 65+ years were cross-linked between PIN and ABC databases (2008-2015) using Personal Health Numbers. Concordant and discordant records were identified by whether or not a specific record co-existed in the two databases. Concordance and discordance (discrepancy) rates, i.e. percentage of concordant or discordant records, were estimated by years and drug types.

## Results

During 2008-2015, there were 1,116,176 records collected by PIN, 1,005,548 records collected by ABC, and a total of 1,218,191 records collected by both for 13,413 ATP participants. The average discrepancy rate between PIN and ABC was 25.8%, and the rate was significantly lower for drugs commonly prescribed for health conditions in seniors, including cardiovascular diseases (18.7% for statin), hypertension (18.9% for beta blockers, ace inhibitors and diuretics), diabetes (23.8% for glucose lower drugs), COPD (20.2% for inhalers) and stomach disorders (22.3% for H2 antagonists and proton pump inhibitors), compared to other drugs (34.4%). For insured drugs, using ABC as reference database, 88.6% of ABC records were concordant with (co-existing in) PIN. The concordance rate for insured drug use was improved by 10% over 2008-2015.

## Conclusion/Implications

By cross-linking two pharmaceutical databases in Alberta for senior ATP participants, we found remarkable discrepancies in pharmaceutical records between PIN and ABC, although there was noticeable improvement over the years. The discrepancy rate between PIN and ABC was drug-specific and significantly lower for drugs commonly prescribed in senior patients.

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