Reliably estimating adherence to therapy in chronic patients from Italian Administrative Databases

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Background
In 2011 the Italian National Agency for Regional Healthcare Services launched the MATRICE Project, aimed to develop tools to monitor quality of healthcare for chronic diseases. Italian Administrative Databases (IAD) are collected uniformly on the whole national population and their use was explored in a sequence of validation studies. Diagnoses performed in an outpatient setting are not collected in IAD, therefore cases of type 2 diabetes mellitus (T2DM) and ischaemic heart disease (IHD) are only imperfectly detected. It was unclear whether adherence to recommended therapies in a population of patients with chronic diseases could be reliably estimated using IAD. On the other hand, medical records (MR) of general practitioners (GPs) were proven in a previous validation study to provide an almost perfect case-finding algorithm.

Objectives
To assess how estimates of adherence to recommended therapies for patients with type 2 diabetes mellitus or ischaemic heart disease from IAD compare with estimates from medical records of general practitioners.

Methods
The medical records of 24 general practitioners were used to detect cases of type 2 diabetes and of ischaemic heart disease, at the beginning of 2012. Permission was granted by the National Privacy Authority to link the list of patients with IAD, at the individual level. Cases of T2DM and of IHD were found in IAD using algorithms combining inpatient diagnosis, exemptions from copayment and drug utilization, before 2012. Adherence to recommended therapies (statins for both diseases, and beta-blockers, ACE inhibitors and antithrombotics for IHD patients) was measured both in IAD and in MR by considering at least, respectively, two dispensings and two prescriptions during 2012. Concordance between the two data sources in the general population was estimated using Cohen’s kappa. For each recommended therapy, the percentages of adherent patients of each GP were estimated in both data sources. Average difference between the percentages were estimated by fitting logistic models with the source of information as a dependent variable. Variance was estimated by clustering the observations on the same patient. Subpopulation analysis were performed in true positives and true negatives.

Results
Data on 32,688 subjects was collected. The average number of patients per GP was 1,362 (IQ range: 1,209-1,500). According to IAD, 2,047 subjects had T2DM: only 107 (5%) were false positives, but additional 823 subjects were false negatives, according to MR (+40%). 745 subjects had IHD according to IAD: 145 (19%) were false positives, and additional 776 subjects were false negatives (+104%).

On the general population adherence to therapies was measured very consistently by the two data sources; Cohen’s kappa was 92 for statins, 91 for beta-blockers, .9 for ACE inhibitors and .89 for antithrombotics. Percentage of adherent patients were consistently overestimated by IAD, although by less than 5 percentage points on average (see figure), and not significantly for ACE inhibitors and antithrombotics. Subpopulation analysis showed that false negatives were less adherent to therapies than true positives (from -11.7 percentage points in antithrombotics, to -24.6 in statins for IHD). False negatives were less adherent either, but to a smaller extent (data not shown).

Conclusion
Cohorts of patients with chronic diseases are identified with good precision in Italian administrative databases, but a relevant number of patients are excluded. Adherence to recommended therapies is estimated consistently by IAD and medical records of general practitioners, and false negatives have lower adherence. Estimates of adherence to recommended therapies in patients with T2DM and IHD obtained from IAD are slightly higher with respect to estimates obtained from medical records.

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