SUPPLEMENTAL MATERIAL

MEDLINE (VIA OVID) SEARCH STRATEGY

1. ((health adj2 administrative adj2 data*) or ((administrative adj2 data) or (administrative adj2 database))).mp. [mp=title, original title, abstract, name of substance word, subject heading word]
2. databases, factual/ or geographic information systems/ or national practitioner data bank/ or databases as topic/
3. 1 or 2
4. sensitivity.mp. or exp "Sensitivity and Specificity"/
5. specificity.ti,ab.
6. exp "Predictive Value of Tests"/
7. ((positive adj predictive adj value) or (negative adj predictive adj value) or (likelihood adj ratio) or (receiver adj operating adj characteristic) or kappa).mp.
8. ((case or cases) adj2 (verificat* or valid* or identif* or definition* or define* orevaluat*)).mp.
9. accuracy.mp
10. or/4-9
10. 3 and 10

INTERNET SEARCH USING KEYWORD IN ITALIAN

Accuratezza dati amministrativi sanitari

Accuratezza diagnostica dei flussi informativi sanitari

Validazione dati amministrativi sanitari

Accuratezza database sanitari

Validazione database sanitari

List of Excluded Studies with Reasons (Full-Text Assessment)

	Full-text reference	Reason for exclusion
1	Arzenton, E., et al. (2013). "Anaphylactic reactions by vaccines: Data from the italian spontaneous reporting system." Drug Safety 36(9): 892.	Not a administrative database; a spontaneous reporting system, no use of ICD-9
2	Amato MP, Grimaud J, Achiti I, et al. European validation of a standardized clinical description of multiple sclerosis. J Neurol. Dec 2004;251(12):1472-1480.	No administrative databases
3*	Barbieri P, Maistrello M. Usefulness of administrative dataases for epidemiological evaluations and healthcare planning. http://www2.mate.polimi.it/ocs/viewpaper.php?id=158&cf=7	A quality study on administrative databases. No specific ICD-9 evaluated for validation.
4	Biagi, C., et al. (2013). "Dronedarone-associated acute renal failure: evidence coming from the Italian spontaneous ADR reporting database." British Journal of Clinical Pharmacology 75(5): 1351-1355.	Not a administrative database; a spontaneous reporting system, no use of ICD-9
5	Binetti R, Costamagna FM, Marcello I. Development of carcinogenicity classifications and evaluations: The case of formaldehyde. Annali dell'Istituto Superiore di Sanita. 2006;42(2):132-143.	Not a validation study

6	Belleudi V, Agabiti N, Kirchmayer U, et al. Definition and validation of a predictive model to identify patients with Chronic Obstructive Pulmonary Disease (COPD) from administrative databases. *Epidemiol. Prev.* May-Aug 2012;36(3-4):162-171.	No comparison with a reference standard
7	Cademartiri F, Maffei E, Notarangelo F, et al. 64-slice computed tomography coronary angiography: diagnostic accuracy in the real world. *Radiol Med.* Mar 2008;113(2):163-180.	No ICD-9 code was considered
8	Calzari MG, Vinceti M, Avanzini P, et al. [Sensitivity and accuracy of health databases in determining incidence of lymphoid malignancies in an Italian population]. *Ann Ig.* Mar-Apr 2006;18(2):127-136.	Despite it appears a validation study no ICD-9 code was listed.
9	Caminiti C, Diodati F, Bacchieri D, et al. Evaluation of a pilot surgical adverse event detection system for Italian hospitals. *Int J Qual Health Care.* Apr 2012;24(2):114-120.	No ICD-9 code listed
10*	Canepa P, Valle L, Cristina E, et al. Role of congenital rubella reference laboratory: 21-months-surveillance in Liguria, Italy. *Journal of Preventive Medicine and Hygiene.* 2009;50(4):221-226.	Not a validation study
11	Carrara G, Scire CA, Cimmino MA, et al. Derivation and validation of a diagnostic algorithm to identify patients with rheumatoid arthritis in administrative health database. Ann Rheum Dis. 2013;72.	A validation study that was published only as an abstract (as of 24/03/2014)
12	Cattran DC, Pei Y, Greenwood CM, Ponticelli C, Passerini P, Honkanen E. Validation of a predictive model of idiopathic membranous nephropathy: its clinical and research implications. *Kidney Int.* Mar 1997;51(3):901-907.	No administrative database was included
13*	Cazzola M, Puxeddu E, Bettoncelli G, et al. The prevalence of asthma and COPD in Italy: A practice-based study. *Respir Med.* Mar 2011;105(3):386-391.	No administrative database was included
14	Chini F, Giorgi Rossi P, Costantini M, Beccaro M, Borgia P. Validity of caregiver-reported hospital admission in a study on the quality of care received by terminally ill cancer patients. *J ClinEpidemiol.* Jan 2010;63(1):103-108.	No specific ICD-9 code assessed
15*	Coiz F, Regattin L, Lorenzon S, Palese A. [Hospital clinical records accuracy in traceability of healthcare associated infections]. *Ann Ig.* May-Jun 2012;24(3):197-206.	No specific ICD-9 code assessed
16	Coloma PM, Valkhoff VE, Mazzaglia G, et al. Accuracy of coding-based algorithms in identification of acute myocardial infarction from multi-country electronic healthcare records (EHR) databases. Pharmacoepidemiology and Drug Safety. 2012;21:395-396.	A validation study performed in 3 countries in Europe including Italy. The data from Italy is not an administrative database
17	Di Bari M, Salvi F, Roberts AT, et al. Prognostic stratification of elderly patients in the emergency department: a comparison between the "Identification of Seniors at Risk" and the "Silver Code". *J Gerontol A BiolSci Med Sci.* May 2012;67(5):544-550.	No administrative database nor a specific ICD-9 code assessed
18	Di Bartolomeo S, Tillati S, Valent F, Zanier L, Barbone F. ISS mapped from ICD-9-CM by a novel freeware versus traditional coding: a comparative study. Scand J Trauma Resusc Emerg Med. 2010;18:17	Not a validation study
19	Di Domenicantonio, R., et al. (2013). "Occurrence of inflammatory bowel disease in a region of central italy. A study based on health information systems." Digestive and Liver Disease 45: S79.	Not a validation study
20*	Di Domenicantonio R, Filocamo A, Baglio G, et al. [Evaluating hospital appropriateness with different tools: administrative data versus analytic review]. *Ann Ig.* Jan-Apr 2004;16(1-2):79-94.	Not a validation study
21	Di Domenicantonio R, Cappai G, Arca M, et al. Occurrence of inflammatory bowel disease in a central region of Italy. A study based on health information systems. Eur J Epidemiol. 2012;27(1):S175-S176.	No assessment of referenc standard (published only as abstract)
22*	Espinal MA, Kim SJ, Suarez PG, et al. Standard short-course chemotherapy for drug-resistant tuberculosis - Treatment outcomes in 6 countries. *JAMA-J. Am. Med. Assoc.* May 2000;283(19):2537-2545.	Not a validation study
23	Faustini A, Canova C, Cascini S, et al. The reliability of hospital and pharmaceutical data to assess prevalent cases of chronic obstructive pulmonary disease. *Copd.* Apr;9(2):184-196	Despite that the study had the assessment of misclassification of COPD in the hospital diagnosis, it failed to used the medical chart as a valid reference standard
24	Fornari C, Madotto F, Demaria M, et al. [Record-linkage procedures in epidemiology: an Italian multicentre study]. Epidemiol Prev. May-Jun 2008;32(3 Suppl):79-88.	Not a validation study. Useful for reference search.

25	Gambassi G, Landi F, Peng L, et al. Validity of diagnostic and drug data in standardized nursing home resident assessments: potential for geriatric pharmacoepidemiology. SAGE Study Group. Systematic Assessment of Geriatric drug use via Epidemiology. *Med Care.* Feb 1998;36(2):167-179.	Study performed in the USA
26*	Gini, R., et al., Chronic disease prevalence from Italian administrative databases in the VALORE project: a validation through comparison of population estimates with general practice databases and national survey. BMC Public Health, 2013. 13: p. 15.	No validation process performed
27*	Gnavi R, Karaghiosoff L, Balzi D, et al. [Diabetes prevalence estimated using a standard algorithm based on electronic health data in various areas of Italy]. Epidemiol Prev. May-Jun 2008;32(3 Suppl):15-21.	This study considered relavant ICD-9 codes of diabetes but did not assess any reference standard
28	Gregori D, Bigi R, Cortigiani L, Bovenzi F, Fiorentini C, Picano E. Non-invasive risk stratification of coronary artery disease: an evaluation of some commonly used statistical classifiers in terms of predictive accuracy and clinical usefulness. *J EvalClinPract.* Oct 2009;15(5):777-781.	Not a validation study
29*	Grosso C, Negrini S, Boniolo A, Negrini AA. The validity of clinical examination in adolescent spinal deformities. *Stud Health Technol Inform.* 2002;91:123-125.	Not a validation study
30*	Gregori D, Petrinco M, Bo S, et al. Using data mining techniques in monitoring diabetes care. The simpler the better? J Med Syst. Apr 2011;35(2):277-281.	Not a validation study
31	Guadagni S, de Manzoni G, Catarci M, et al. Evaluation of the Maruyama computer program accuracy for preoperative estimation of lymph node metastases from gastric cancer. *World J Surg.* Dec 2000;24(12):1550-1558.	Not a validation study
32	Guasticchi G, Giorgi Rossi P, Lori G, et al. Syndromic surveillance: sensitivity and positive predictive value of the case definitions. *Epidemiol Infect.* May 2009;137(5):662-671.	13 syndromes in a surveillance system that had not ICD-9 code specified
33	La Montagna G, Tirri R, Baruffo A, Preti B, Viaggi S. Clinical pattern of pain in rheumatoidarthritis. *ClinExpRheumatol.* Sep-Oct 1997;15(5):481-485.	Not an administrative database, no ICD-9 code evaluated
34	Leone MA, Gaviani P, Ciccone G. Inter-coder agreement for ICD-9-CM coding of stroke. *Neurol Sci.* Dec 2006;27(6):445-448.	Methodological study
35	Lorenzoni L, Da Cas R, Aparo UL. The quality of abstracting medical information from the medical record: The impact of training programmes. *Int J Qual Health Care.* 1999;11(3):209-213.	Not a validation study (references searched)
36	Lorenzoni L, Da Cas R, Aparo UL. Continuous training as a key to increase the accuracy of administrative data. *J EvalClinPract.* Nov 2000;6(4):371-377.	Not a validation study (references searched)
37*	Louis DZ, Yuen EJ, Maio V, et al. A population-based longitudinal healthcare database in the Emilia-Romagna Region, Italy: a resource for planning and research. Health Policy Newsletter. 2005;18(2):8.	Not a validation study
38*	Lovison G, Bellini P. Study on the accuracy of official recording of nosological codes in an Italian regional hospital registry. Methods of information in medicine. Jul 1989;28(3):142-147.	This study is about accuracy of recording of diagnostic codes, however, no validated ICD was provided
39	Maiellaro PA, Cozzolongo R, Marino P. Artificial neural networks for the prediction of response to interferon plus ribavirin treatment in patients with chronic hepatitis C. *Curr Pharm Des.* 2004;10(17):2101-2109.	Not a validation study
40*	Manfredi R, Calza L. Extensively drug-resistant tuberculosis in patients recently immigrated from Eastern Europe. Microbiological, therapeutic, and public health features. *Clinical Microbiology and Infection.* 2009;15:S133.	Not a validation study
41*	Mannino S, Troncon MG, Wallander MA, et al. Ocular disorders in users of H2 antagonists and of omeprazole. *PharmacoepidemiolDrugSaf.* Jul 1998;7(4):233-241.	Not a validation study
42*	Manzoli L, Villari P, Granchelli C, et al. Influenza vaccine effectiveness for the elderly: a cohort study involving general practitioners from Abruzzo, Italy. *J PrevMedHyg.* Jun 2009;50(2):109-112.	Not a validation study
43	Marchetti F, Assael B, Gabutti G, et al. Monitoring the rate of hospitalization before rotavirus immunization in Italy utilizing ICD9-CM regional databases. Hum. Mar 2009;5(3):172-176.	No reference standard evaluated
44	Marmo, R, et al. (2013). "Predicting mortality in patients with in-hospital nonvariceal upper GI bleeding: a prospective, multicenter database study." Gastrointestinal Endoscopy.	No ICD-9 for gastrointestinal bleeding evaluated.

45*	Mattioli C, Beretta L, Gerevini S, et al. Traumatic subarachnoid hemorrhage on the computerized tomography scan obtained at admission: a multicenter assessment of the accuracy of diagnosis and the potential impact on patient outcome. *J Neurosurg.* Jan 2003;98(1):37-42.	Administrative database not used
46*	Menniti-Ippolito F, Spila-Alegian S, Vanacore N, et al. Estimate of Parkinsonism prevalence through drug prescription histories in the province of Rome, Italy. *Acta Neurologica Scandinavica.* 1995;92(1):49-54.	Not a validation study
47*	Merlo DF, Knudsen LE, Matusiewicz K, Niebroj L, Vahakangas KH. Ethics in studies on children and environmental health. *Journal of Medical Ethics.* 2007;33(7):408-413.	Not a validation study (references checked)
48	Migliore E, Bugiani M, Piccioni P, et al. [Obstructive lung disease prevalence estimated using a standard algorithm based on electronic health data in various areas of Italy]. *Epidemiol Prev.* May-Jun 2008;32(3 Suppl):66-77.	No reference standard used
49*	Monte S, Macchia A, Pellegrini F, et al. Antithrombotic treatment is strongly underused despite reducing overall mortality among high-risk elderly patients hospitalized with atrial fibrillation. *Eur Heart J.* 2006;27(18):2217-2223.	Not a validation study
50	Molica, S., et al. (2013). "External validation on a prospective basis of a nomogram for predicting the time to first treatment in patients with chronic lymphocytic leukemia." Cancer 119(6): 1177-1185.	No ICD-9 for chronic lymphocytic leukemia evaluated
51	Morciano, A., et al. (2013). "Validation of a new index of insulin resistance in non-obese women with polycystic ovary syndrome." Reproductive Sciences 20(3): 179A.	No ICD-9 evaluated for validation. (Abstract)
52	Moretti, U., et al. (2013). "Case definition of torsades des pointes and related clinical events in spontaneous reporting: The ARITMO experience." Drug Safety 36(9): 891.	No administrative database considered (Abstract)
53	Moro ML, Morsillo F. Can hospital discharge diagnoses be used for surveillance of surgical-site infections? J Hosp Infect. Mar 2004;56(3):239-241.	Data were collected actively for a survey; no list of ICD-9 codes were provided. It was unclear if medical charts were assessed as reference standard.
54*	Nordio M, Antonucci F, Feriani M, Inio A, Marchini P. [Reliability of administrative databases in epidemiological research: the example of end-stage renal disease requiring renal replacement therapy in patients with diabetes]. *G ItalNefrol.* Mar-Apr 2009;26 Suppl 45:S7-11.	No reference standard was used
55	Palmieri L, Barchielli A, Cesana G, et al. The Italian register of cardiovascular diseases: attack rates and case fatality for cerebrovascular events. *Cerebrovasc Dis.* 2007;24(6):530-539.	Register for cardiovascular disease – not administrative database
56	Pagano E, Gregori D, Filippini C, et al. Impact of initial pattern of care on hospital costs in a cohort of incident lung cancer cases. J Eval Clin Pract. Apr 2012;18(2):269-275	Not a validation study
57	Parazzini, F., et al. (2013). "Temporal trends and determinants of peripartum hysterectomy in Lombardy, Northern Italy, 1996-2010." Archives of Gynecology & Obstetrics 287(2): 223-228.	No validation assessment performed for the ICD-9 and 10 considered
58	Pellegrino, P., et al. (2013). "Acute Disseminated Encephalomyelitis Onset: Evaluation Based on Vaccine Adverse Events Reporting Systems." PLoS ONE 8(10).	Not administrative database
59	Porpiglia, F., et al. (2013). "Active surveillance for prostate cancer: Diagnostic accuracy of multiparametric mri in selection of patients." Journal of Urology 189(4): e905.	Not administrative database
60*	Puro V, Girardi E, Daglio M, Simonini G, Squarcione S, Ippolito G. Clustered cases of pneumonia among healthcare workers over a 1-year period in three Italian hospitals: Applying the WHOSARS alert. *Infection.* Aug 2006;34(4):219-221.	Not a validation study
61	Raimondi G, Juliano G, Gregu S, Suriano P, Sisillo E. Predictors of inotropic drugs utilization in adult cardiac surgery with cardiopulmonary bypass. Intensive Care Med. 2012;38:S28.	Not a validation study
62*	Ravizza P, Pasini E. [Electronic medical records: medical and legal aspects, privacy, safety, and legal validity]. *Ital Heart J Suppl.* Mar 2001;2(3):268-286.	Review
63	Raschi, E., et al. (2013). "Comparison of torsadogenic events extracted from national pharmacovigilance databases: An overview from the ARITMO project." Drug Safety 36(9): 879.	Not administrative database

64	Repetto F, Federico P, Cattaneo A, Taroni F, Apolone G. [Evaluation of activity in intensive care. A comparison of administrative and epidemiologic data]. *Minerva Anestesiol.* Mar 1996;62(3):73-87.	Not a validation study- comparison of incidence between cohorts
65*	Rosati E, Agabiti E, Limongelli P, Materia E, Glwsticchi G. Qualita della cartella clinica e della scheda di dimissione ospedaliera: studio retrospettivo in alcuni ospedali di Roma. Ig Sanità Pubblica. 2004; 60: 243-257	A quality study on administrative databases. No specific ICD-9 evaluated for validation.
66*	Rosato R, Sacerdote C, Pagano E, et al. Appropriateness of early breast cancer management in relation to patient and hospital characteristics: a population based study in Northern Italy. *Breast Cancer Research and Treatment.* Sep 2009;117(2):349-356.	Not a validation study
67	Schuemie, M. J., et al. (2013). "Replication of the OMOP experiment in europe: Evaluating methods for risk identification in electronic health record databases." Drug Safety 36(SUPPL.1): S159-S169.	No validation process performed
68*	Tancioni V, Collini F, Balzi D, et al. [Acute stroke incidence estimated using a standard algorithm based on electronic health data in various areas of Italy]. Epidemiol Prev. May-Jun 2008;32(3 Suppl):38-45.	The study evaluated ICM-codes relevant to stroke but failed to assess the reference standard
69*	Tessari R, Migliore E, Balzi D, et al. [Asthma prevalence estimated using a standard algorithm based on electronic health data in various areas of Italy]. Epidemiol Prev. May-Jun 2008;32(3 Suppl):56-65.	Despite the apparent evaluation of the SDO the study did not perform any validation study.
70	Valkhoff VE, Coloma PM, Lapi F, et al. Positive predictive value for upper gastrointestinal bleeding in four health care databases using different coding systems in the EU-ADR project. *Pharmacoepidemiology and Drug Safety.* 2012;21:393.	Accuracy study but published only as an abstract
71	Yuen E, Louis D, Cisbani L, et al. Using administrative data to identify and stage breast cancer cases: implications for assessing quality of care. *Tumori.* Jul-Aug;97(4):428-435.	No validation process performed
72*	Zocchetti C, Riboldi L. Causality and criminal trial: The role of epidemiology. *Giornale Italiano di Medicina del Lavoro ed Ergonomia.* 2003;25(3):292-293.	Not a validation study

(*) Studies retrieved from consultation of Internet search, abstract and monographs of Italian journals and reference search.