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Brief communication

Improving completeness of ascertainment and quality of information for pregnancies through linkage of administrative and clinical data records

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ABSTRACT

Purpose: Birth cohorts are a common tool used in epidemiological studies about pregnancy; yet these datasets systematically miss pregnancies that are spontaneously lost or terminated. This study examined the feasibility of linking administrative and clinical datasets from Alberta Canada to identify a pregnancy cohort that includes spontaneous and medical pregnancy losses.
Methods: Deterministic linkage was used to link data from twelve clinical and administrative datasets for women who conceived between November 2007 and February 2008. Descriptive statistics were used to characterize the relative contribution of each dataset to the overall dataset.
Results: Overall, 6,477 unique pregnancies were eligible for inclusion, resulting in a live birth rate of 94.1%, a stillbirth rate of 0.5%, a fetal death rate of 4.1%, and an estimated 1.3% of the cohort moving out of the study area. No single dataset could identify all pregnancies. Individual databases identified 2.0–99.1% of the cohort. Fetal deaths were most frequently identified in outpatient physician claims, emergency room visits, ultrasound data, or from the cytogenetic laboratory.
Conclusions: Linkage of clinical and administrative databases to identify pregnancy is feasible and can overcome many limitations associated with the use of a single dataset; however, fetal deaths continue to be under-ascertained.

Introduction

Birth cohorts commonly are used to study pregnancy care and outcomes; however, these systematically miss pregnancies that are spontaneously lost or terminated [1]. Pregnancy losses also often are unreliably identified in administrative datasets [2–4]. We aimed to examine the feasibility of linking administrative and clinical datasets from Alberta Canada to identify a pregnancy cohort based on dates of conception rather than dates of birth (to capture pregnancy losses).

Methods

This cohort included all women who conceived between November 4, 2007, and February 23, 2008; resided in the Calgary Zone of Alberta Health Services; and had publically funded provincial health insurance. Ethics approval was obtained from the University of Calgary Conjoint Health Research Ethics Board.

Identifiable data were obtained from 12 clinical and administrative databases on health care contacts that occurred between August 12, 2007, and March 4, 2009. Clinical data providers searched clinic databases for visits that occurred in the eligible time period; for clinical services that were exclusively offered to pregnant women (i.e., prenatal screening), data on all visits in the eligible time period were extracted; for clinical services that were offered to the general population (i.e., laboratory services), pregnant women were identified through a series of service codes, and

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Table 1
Description of datasets used to create the cohort (total number of pregnancies, n = 6477; total number of pregnancy losses, n = 263)

Dataset	Type	Data custodian/provider	Population coverage	Total number of pregnancies identified/ number of pregnancies only identified in this dataset n (%)/n (%)	Includes data on pregnancy losses (spontaneous or medical)	Number of pregnancy losses identified, n (%)
Alberta Congenital Anomalies Surveillance System	Administrative	Province (Alberta Health)	All children in Alberta who are identified as having a major congenital anomaly within the first year of life and pregnancies that are terminated due to the presence of a congenital anomaly.	246 (3.8)/0 (0)	Yes	< 5
Ambulatory Care Classification System	Administrative	Province (Alberta Health)	All patients accessing emergency rooms or day surgeries in the province.	5266 (81.3)/0 (0)	Yes	106 (40.3)
Alberta Perinatal Health Program	Administrative	Province (Alberta Perinatal Health Program)	All birth events, regardless of location (home or hospital) that occurred at and after 20 weeks' gestation in the province.	5990 (92.5)/0 (0)	No	0 (0)
Calgary Laboratory Services	Clinical	Health Region (Calgary Laboratory Services)	All patients accessing inpatient and outpatient laboratory services in the former Calgary Health Region. Patients must have received a lab requisition from their health care provider to access these services.	5295 (81.8)/0 (0)	No	0 (0)
Cytogenetic Laboratory	Clinical	Institution (Department of Medical Genetics)	All patients accessing cytogenetic laboratory services in the southern part of Alberta. Patients must have a referral from their health care provider to access these services.	346 (5.3)/< 5	Yes	64 (24.3)
Discharge Abstract Database	Administrative	Province (Alberta Health)	All patients admitted to hospitals in the province. Less than 1% of births in Alberta occur outside of a hospital [5].	6120 (94.5)/< 5	Yes	36 (13.7)
Early Risk Assessment Clinic	Clinical	Private Company (EFW Radiology, in Calgary)	All patients accessing first-trimester screening in Southern Alberta. Patients can self-refer or receive a referral from their health care provider. This program was run on pilot funding during this time period and limited to 7000 patients per year.	2239 (34.6)/17 (0.3)	Yes	< 5
EFW Radiology	Clinical	Private Company (EFW Radiology)	Patients accessing radiology services within the city of Calgary. Patients can self-refer or receive a referral from their health care provider.	2720 (42.0)/8 (0.1)	Yes	87 (33.1)
Invasive Testing Clinical Data	Clinical	Institution (Department of Obstetrics and Gynecology)	All women who underwent chorionic villus sampling or amniocentesis to assess for the presence of chromosomal abnormalities at the only tertiary care hospital in Calgary. Patients must have a referral from their health care provider to access these services.	231 (3.6)/< 5	No	0 (0)
Medical Genetics Clinics	Clinical	Institution (Department of Medical Genetics)	All patients accessing genetic services in the southern part of Alberta. Patients must have a referral from their health care provider to access these services.	239 (3.7)/0 (0)	No	0 (0)
Physician Claims	Administrative	Province (Alberta Health)	All patients visiting an outpatient physician remunerated by fee-for-service payments from the provincial ministry of health.	6416 (99.1)/< 5	Yes	153 (58.2)
Population Registry	Administrative	Province (Alberta Health)	All insured individuals in the province.	6477 (100)/0 (0)	No	0 (0)
Regional Fertility Program	Clinical	Private Company (Regional Fertility Program)	All patients accessing in vitro fertilization services in the province of Alberta. Patients can self-refer or receive a referral from their health care provider.	129 (2.0)/0 (0)	No	0 (0)