Using Health Administrative Data to evaluate practice and outcomes: Surveillance, Data Capture and Quality, Burden on the System, Getting Quality Information to Assist with Informed Decision Making

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NLCAHR’s Cost and Value in Healthcare Research Exchange Group

November 27, 2017
Outline

- Overview of PPNL
- Data Capture & Surveillance
- Quality
- Decision Support
- Burden on the Healthcare System
PPNL - about us

- Established in 1979
- Mandate - improve pregnancy outcomes and provide a follow-up clinic to infants at high risk for developmental delay.
### PPNL - high risk clinic

<table>
<thead>
<tr>
<th>FOLLOW-UP CLINIC ADMISSION CRITERIA*</th>
<th>PERCENTAGE OF 2015-16 CLINIC INTAKE</th>
<th>PERCENTAGE OF 2014-15 CLINIC INTAKE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal Substance Use</td>
<td>36.2%</td>
<td>38.2%</td>
</tr>
<tr>
<td>Birth Weight ≤1500 grams</td>
<td>35.6%</td>
<td>24.4%</td>
</tr>
<tr>
<td>Ventilated for 48 hours or more</td>
<td>20.8%</td>
<td>28.5%</td>
</tr>
<tr>
<td>Specific Physician Request</td>
<td>10.1%</td>
<td>10.6%</td>
</tr>
<tr>
<td>Complex Surgery</td>
<td>6.7%</td>
<td>8.1%</td>
</tr>
<tr>
<td>Seizures in 1st 28 days of life</td>
<td>3.4%</td>
<td>10.6%</td>
</tr>
<tr>
<td>APGAR Score ≤ 3 for ≥ 5 minutes</td>
<td>0.7%</td>
<td>7.3%</td>
</tr>
<tr>
<td>Cord Blood pH &lt; 7</td>
<td>1.3%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Intraventricular Hemorrhage (IVH)</td>
<td>4.0%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Meningitis in 1st 28 days of life</td>
<td>0.7%</td>
<td>3.3%</td>
</tr>
<tr>
<td>Periventricular Leukomalacia (PVL)</td>
<td>0.7%</td>
<td>0.8%</td>
</tr>
</tbody>
</table>

* Criteria changed in Sept 2015
PPNL – what else to we do

- Data Collection: Follow-up, Surveillance Program, Congenital Anomalies (Barb)
PPNL – what else to we do

- Education (Clare, Susan, Janine): FHS, NRP, ACoRN, Obstetrical updates & Collaborative Neonatal Education, Breastfeeding
PPNL – what else to we do

- Surveillance Reports: All RHAs
PPNL – what else to we do

- Decision Support
- Resident Project Support
- Applied Research
PPNL – what else do we do

- Canadian Congenital Anomalies Surveillance Network (CCASN)

- To support the development and maintenance of high quality population-based surveillance systems of congenital anomalies that will provide information to improve the health of Canadian children and their families.
“Approximately 1 in 25 infants is diagnosed yearly with one or more congenital anomalies. For families, a congenital anomaly diagnosis can involve profound psychological, emotional and financial burdens.”
Benefits of Surveillance Reporting

- Provide timely identification and communication of epidemiological trends
- A valuable resource for healthcare providers, government organizations and researchers to inform public health programs
- Support evidence-based decision making
- Ultimately contribute to reducing the burden
Benefits of Surveillance Reporting
Exploring data to examine practice


**Examining caesarean section rates in Canada using the Robson classification system.**


**Author information**

**Abstract**

**OBJECTIVE:** To determine the groups within the obstetric population contributing most substantially to the Caesarean section rate in five Canadian provinces.

**METHODS:** Hospital births from five participating provinces were grouped into Robson's 10 mutually exclusive and totally inclusive classification categories. The relative contribution of each group to the overall CS rate, relative size of group, and CS rate were calculated for British Columbia, Alberta, Ontario, Nova Scotia, and Newfoundland and Labrador for the four-year period from 2007-2008 to 2010-2011.

**RESULTS:** In all five provinces (accounting for approximately 64% of births in Canada), and for all years examined, the group making the largest relative contribution to the CS rate was women with at least one previous CS and a term, singleton, cephalic-presenting pregnancy (Robson Group 5). The CS rate for this group ranged from 76.1% in Alberta to 89.9% in Newfoundland and Labrador in 2010 to 2011, accounting for 11.3% of all deliveries. The rate of CS for Group 5 decreased slightly over the four years, except in Ontario. The next largest contributing group was nulliparous women with a term, singleton, cephalic-presenting pregnancy. Those with induced labour or Caesarean section before labour (Robson Group 2) had CS rates ranging from 34.4% in Nova Scotia to 44.6% in British Columbia (accounting for 13.1% of all deliveries), and those with spontaneous onset of labour (Robson Group 1) had CS rates of 14.5% to 20.3% in 2010 to 2011 (accounting for 23.6% of all deliveries).

**CONCLUSION:** All hospitals and health authorities can use this standardized classification system as part of a quality improvement initiative to monitor Caesarean section rates. This classification system identifies relevant areas for interventions and resources to reduce rates of Caesarean section.
RESULTS:
In all five provinces (accounting for approximately 64% of births in Canada), and for all years examined, the group making the largest relative contribution to the CS rate was women with at least one previous CS and a term, singleton, cephalic-presenting pregnancy (Robson Group 5). The CS rate for this group ranged from 76.1% in Alberta to 89.9% in Newfoundland and Labrador in 2010 to 2011, accounting for 11.3% of all deliveries.
Exploring data to examine outcome

Determinants of developmental outcomes in a very preterm Canadian cohort.

Syennes A1, Liu TM2, Maddern M3, Church P4, Lee D5, Vincer M6, Ballantyne M7, Mainemer A8, Creelton D9, Yang J1, Sauve R8, Salgat J10, Shah P4, Lee SK4, Canadian Neonatal Network and the Canadian Neonatal Follow-Up Network

Collaborators (86)


Abstract

OBJECTIVES: Identify determinants of neurodevelopmental outcome in preterm children.

METHODS: Prospective national cohort study of children born between 2009 and 2011 at <29 weeks gestational age, admitted to one of 28 Canadian neonatal intensive care units and assessed at a Canadian Neonatal Follow-up Network site at 21 months corrected age for cerebral palsy (CP), visual, hearing and developmental status using the Bayley Scales of Infant and Toddler Development-Third Edition (Bayley-III). Stepwise regression analyses evaluated the effect of (1) prenatal and neonatal characteristics, (2) admission severity of illness, (3) major neonatal morbidities, (4) neonatal neuromaging abnormalities, and (5) site on neurodevelopmental impairment (NDI) (Bayley-III score < 85, any CP, visual or hearing impairment), significant neurodevelopmental impairment (sNDI) (Bayley-III < 70, severe CP, blind or hearing aided and sNDI or death).

RESULTS: Of the 3700 admissions without severe congenital anomalies, 84% survived to discharge and of the 2340 admissions, 46% (ICER site variation 38%-51%) had a NDI, 17% (11%-23%) had a sNDI, 6.4% (3.1%-8.6%) had CP, 2.6% (2.3%-3.7%) had hearing aids or cochlear implants and 1.6% (0%-3.1%) had a bilateral visual impairment. Bayley-III composite scores of <70 for cognitive, language and motor domains were 3.3%, 10.9% and 6.7%, respectively. Gestational age, sex, birth weight, illness severity, bronchopulmonary dysplasia, necrotising enterocolitis, late-onset sepsis, retinopathy of prematurity, abnormal neuroimaging and site were significantly associated with NDI or sNDI. Site variation ORs for NDI, sNDI and sNDI/death ranged from 0.3-4.3, 0.04-3.5 and 0.12-1.96, respectively.

CONCLUSION: Most preterm survivors are free of sNDI. The risk factors, including site, associated with neurodevelopmental status suggest opportunities for improving outcomes.
A comparison of breastfeeding rates by obesity class.

Ranjit N1, Challis S2,3, Murphy PA1,4,5, Quinlan J6, Crane JMG1.

Author information

Abstract

PURPOSE: The purpose of this study is to compare breastfeeding initiation rates for women across body mass index (BMI) classes, including normal BMI (18.50-24.99 kg/m²), overweight (25.00-29.99 kg/m²), obese (30.00-39.99 kg/m²), morbidly obese (40.00-49.99 kg/m²), and extreme obesity (≥50.00 kg/m²).

MATERIALS AND METHODS: Retrospective cohort of women with singleton pregnancies, delivering in St. John's, NL between 2002 and 2011. The primary outcome was any breastfeeding on hospital discharge. Breastfeeding rates across BMI categories were compared, using univariate analyses. Multivariate analysis included additional maternal and obstetric variables.

RESULTS: Twelve thousand four hundred twenty-two women were included; 8430 breastfed and 3992 did not breastfeed on hospital discharge. Progressively decreasing rates of breastfeeding were noted with increasing obesity class: normal BMI (71.1%), overweight (69.1%), obese (61.6%), morbidly obese (54.2%), and extremely obese women (42.3%). Multivariate analysis confirmed that increasing obesity class resulted in lower odds of breastfeeding: overweight (adjusted odds ratios (aOR) 0.86, 95%CI 0.76-0.98), obese (aOR 0.65, 95%CI 0.57-0.74), morbidly obese (aOR 0.57, 95%CI 0.44-0.74), and extreme obesity (aOR 0.37, 95%CI 0.19-0.74).

CONCLUSION: Women in higher obesity classes are progressively less likely to initiate breastfeeding. Women with the highest prepregnancy BMIs should be particularly counseled on the benefits of breastfeeding.
Data Capture and Quality

Save each 3M report as an excel file

Copy/link each excel report into 1-2 worksheets via UPI

Import excel file into SPSS and create separate MPS files prior to linking mom and baby records
Data Quality

- Data are of high quality “if they are fit for their intended uses in operations, decision making and planning”
Data Quality

if data was water...

Data Quality
ensures water is pure and
does not get contaminated

Data Governance
makes sure the right people
with the right tools are
responsible for the right
parts of the water system
Data Quality
Data Quality
Data Quality

CAUTION: BAD DATA

Bad data quality may result in frustration and lead to drop kicking your computer
Data Quality

- “Missing records were excluded from the denominator used to calculate the estimates (rates) on all indicators (more common on self-reported data) and reported based on degree missing. If less than 10% of data are missing, then this is simply stated. If 10%-30% of data are missing, the reader is cautioned with respect to interpretation. If missing data exceeds 30%, then the value is suppressed and not presented.”
Data Quality

- Hmm, “the data” – it is a two-edged sword, with a potential for enormous good and the potential for... well, bad things can happen with poor quality data.
Data Quality

- Bad Things Do Happen
Data Quality

Processes Bringing Data from Outside
- Initial Data Conversion
- System Consolidations
- Manual Data Entry
- Batch Feeds
- Real-Time Interfaces

Processes Causing Data Decay
- Changes Not Captured
- System Upgrades
- New Data Uses
- Loss of Expertise
- Process Automation

Processes Changing Data from Within
- Data Processing
- Data Cleansing
- Data Purging
Data Quality

I didn’t have any accurate numbers so I just made up this one.

Studies have shown that accurate numbers aren’t any more useful than the ones you make up.

How many studies showed that? Eighty-seven.
Data Quality

You can't
MANAGE
What you
CAN'T
MEASURE
Communication
Mis/Non- Communication

Newfoundland and Labrador Provincial Perinatal Program - 3M Entry Screens Manual

3M Prompt
Data Entry (Pre Delivery Wgt kg)
Reporter (PerDeliverykg)

If the pre-delivery weight is not available on the Obstetrical Nursing Care Plan, the patient’s last weight on the Prenatal Record can be used.

c.g. 70 - 75 kg. = 75

If pre-delivery weight is unknown, add pre-pregnancy weight and weight gain.

Code 999 for an unknown value.
Quality Assurance

A data quality assurance program is an explicit combination of organization, methodologies, and activities that exist for the purpose of reaching and maintaining high levels of data quality. The term assurance puts it in the same category as other functions corporations are used to funding and maintaining. Quality assurance, quality control, inspection, and audit are terms applied to other activities that exist for the purpose of maintaining some aspect of the corporation's activities or products at a high level of excellence. Data quality assurance should take place alongside these others, with the same expectations.
Quality Assurance - examples

- Gestational Age
- Date of Delivery
- Where From
- Link Number
- Dx (Multiple Births, Diabetes, Induction)
- Height and Weight
- APGAR, Caregiver at Delivery
- Breastfeeding, Type of 1st Feed, MSS
Quality Assurance - examples

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Quality Assurance - examples

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Quality Assurance - examples

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</tbody>
</table>
Quality Assurance

Database Presents

Ugly Edits

Vol. 2

Releasing on May 25th

Just one more compilation of ugly edits

Data Quality

Ensures water is pure and does not get contaminated

if data was water...
Decision Support

- Request from care providers, other departments, prov/fed government, researchers, public
  - datawarehouses, cubes
  - Requires planning, human resources, funding
CIHR Call for Perinatal Health Systems Improvement

- Tiers of Service – organizing a framework for a coordinated health service
- Prevention, Primary & Emergent Services up to Provincial Subspecialty Health Services
- May not be the same for type of patient
- Can be assigned by acuity or complexity
CIHR Call for Perinatal Health Systems Improvement

- Rural Maternity Care – 18% of births (CIHI ‘13)
- 40% travel more than 1 hour to access services
- 1 in 6 rural women travel more than 2 hours
- Greater distance great risk or poorer outcomes
- Risk for perinatal death for AOOH births is 6X
- Emergency transport, clinical prediction model
Burden on the health system

- 2006 report
- 10% spending on mom and babies ($821M in 02/03), other costs pre/during/post
- VD $2700 vs $4600 for CS
- Spending for babies ranged from $795 to $117,806
- NICU rates are rising
Burden on the health system

The Facts

The costs and performance of Canada’s health system

What we are spending and how

The Commission carried out its work against a very specific historical backdrop. Our healthcare system has been largely built upon a reactive, sickness model, where treatment services dominate and care is focused in clinics, hospitals and other institutions. Physicians are typically the access point for this acute care system.

Some $200 billion, closing in on 50 per cent of some provincial budgets, are now spent to keep this system operating each year — based on GDP, the world’s sixth most expensive health-care system per capita. Of this amount, more than three quarters (about 76 per cent) is spent for hospitals and other institutions, physicians’ fees and drugs. Hospital costs include expenditures such as nurses’ salaries.
Burden on the health system

- “An integrated system of continuing care is a cornerstone of high-performing health care systems” – John G. Abbott March 2012
Who Plays A Role

- Careproviders
- Health Information Management Professionals (aka the Health Record Coders)
- Data/Research Analysts, Epidemiologists, IT
- Clinical Educators, Managers, Vendors
- Program Evaluators, Policy Writers
- Quality, Decision Support, Advisory, Government, University Researchers
Everyone’s Role is Crucial

Data Carries Weight
Final Points

- Accurate surveillance contributes to our knowledge of the possible causative factors and impact of preventive measures on the burden of _______________ in Canada.
Final Points

- An increase in passion leads to an increase in quality
- Information Sharing Helps everyone
- Can Impact Decision Support and Research
- Better Data, Better Measurement, Better Management, Better Care, Better Practice, Increase Savings, Decrease Burden
Final Points

- Important to have a strong link with all stakeholders
A Reason to be Passionate
Thank You for Listening
Questions?

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Professional Associate - Memorial University (Ob/Gyn, Pediatrics)

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