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



Phil A. Murphy, BSc (Hons), MSc Clinical Epidemiologist – PPNL Professional Associate – MUN (Ob/Gyn, Pediatrics) Expert Advisory Committee – CPSS - PHAC phil.murphy@easternhealth.ca NLCAHR's Cost and Value in Healthcare Research Exchange Group

November 27, 2017

Google

PPNL



Perinatal Program

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

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



Data Collection: Follow-up, Surveillance
 Program, Congenital Anomalies (Barb)

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Perinatal Program Newfoundland

 Education (Clare, Susan, Janine): FHS, NRP, ACoRN, Obstetrical updates & Collaborative Neonatal Education, Breastfeeding



Neonatal Resuscitation " Program™



Skin-to-skin helps the milk kick in.

To Learn More: babyfriendlynl.ca







Surveillance Reports: All RHAs



St. John's Area Perinatal Data Report 2008

> Prosterial Printed Program



Perinatal Data Report 2008







Central and Northeast Labrador Perinatal Report 2006-2009





Perinatal Report 2006-2009







Perinatal Program Newfoundland

- Decision Support
- Resident Project Support
- Applied Research





 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.





PUBLIC HEALTH AGENCY OF CANADA

"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."

CONGENITAL ANOMALIES IN CANADA 2013

A PERINATAL HEALTH SURVEILLANCE REPORT





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

PUBLIC HEALTH AGENCY OF CANADA

PERINATAL HEALTH INDICATORS FOR CANADA 2017

A REPORT FROM THE CANADIAN PERINATAL SURVEILLANCE SYSTEM



PROTECTING CANADIANS FROM ILLNESS



Canada

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CONTRIBUTORS

PUBLIC HEALTH AGENCY OF CANADA Jenna Coles Paromita Deb-Rinker Mary Lou Decou Susie Dzekpasu Juan Andres Leon Shiliang Liu Wei Luo Myuri Manogaran Chantel Nelson Victoria Otterman Jocelyn Rouleau Manal Salibi Judy Snider

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FOR EXTERNAL DATA USED IN THIS REPORT: Canadian Institute for Health Information (CIHI)

Statistics Canada (Vital Statistics)



Exploring data to examine practice

J Obstet Gynaecol Can. 2013 Mar;35(3):206-214. doi: 10.1016/S1701-2163(15)30992-0.

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

Kelly S¹, Sprague A¹, Fell DB¹, Murphy P², Aelicks N³, Guo Y⁴, Fahey J⁵, Lauzon L⁵, Scott H⁶, Lee L⁷, Kinniburgh B⁷, Prince M¹, Walker M⁸.

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.



Exploring data to examine practice

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

Arch Dis Child Fetal Neonatal Ed. 2017 May;102(3):F235-F234. doi: 10.1136/archdischild-2016-311228. Epub 2016 Oct 6.

Determinants of developmental outcomes in a very preterm Canadian cohort.

Synnes A¹, Luu TM², Moddemann D³, Church P⁴, Lee D⁵, Vincer M⁶, Ballantyne M⁷, Majnemer A⁸, Creighton D⁹, Yang J⁴, Sauve R⁹, Saigal S¹⁰, Shah P⁴, Lee SK⁴, Canadian Neonatal Network and the Canadian Neonatal Follow-Up Network.

Collaborators (56)

Harrison A, Ting J, Yee W, Aziz K, Toye J, Kalapesi Z, Sankaran K, Daspal S, Seshia M, Alvaro R, Shivananda S, Da Silva O, Nwaesei C, Lee KS, Dunn M, Rouvinez-Bouali N, Dow K, Pelausa E, Kovacs L, Barrington K, Drolet C, Piedboeuf B, Riley SP, Claveau M, Faucher D, Bertelle V, Masse E, Canning R, Makary H, Ojah C, Monterrosa L, Andrews W, Deshpandey A, McMillan D, Afifi J, Pillay T, Synnes A, Sauvé R, Reichert A, Bodani J, Sankaran K, Nwaesei C, Daboval T, Dow K, Ly L, Kelly E, Helou SE, Pelausa E, Riley SP, Levebvre F, Demers C, Bélanger S, Canning R, Monterrosa L, Makary H, Murphy P.

Author information

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 neuroimaging 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% (IQR site variation 38%-51%) had a NDI, 17% (11%-23%) had a sNDI, 6.4% (3.1%-8.6%) had CP, 2.6% (2.5%-13.3%) 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, outborn, 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.



Exploring data to examine risks

J Matern Fetal Neonatal Med. 2017 Aug 11:1-6. doi: 10.1080/14767058.2017.1362552. [Epub ahead of print]

A comparison of breastfeeding rates by obesity class.

Ramji N¹, Challa S^{2,3}, Murphy PA^{1,4,5}, 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 (\geq 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



Perinatal

 Data are of high quality "if they are fit for their intended uses in operations, decision making and planning"





i

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















CAUTION: BAD DATA



BAD DATA QUALITY MAY RESULT IN FRUSTRATION AND LEAD TO DROP KICKING YOUR COMPUTER



 "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."



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.





Bad Things Do Happen



Commission of Inquiry on HORMONE RECEPTOR TESTING



Volume 1 Investigation and Findings

Volume 2 "Looking Forward..." Policy Papers

Volume 3 Appendices

> The Honourable Margaret A. Cameron Commissioner





Perinatal Program















Mis/Non-Communication

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

<u>3M Prompt</u> Data Entry (Pre *Delivery Wgt kgs*) Reporter (*PerDelwgtkg*)

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

X

HDM Data Entry -- RDL Execution Error





e.g. 70 - 75 kg. = 75

If pre-delivery weight is unknown, add prepregnancy 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.



- 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



AdmitDate	DischDate	DeliveryTime	DELIVERY YEAR	CalendarYear	YEARMATCH
06-MAR-2004	10-MAR-2004	03/06/2004 18:56	2004	2004	1.00
20-SEP-2006	22-SEP-2006	09/21/06 00:47:00	2006	2006	1.00
09-MAY-2007	12-MAY-2007	05/09/2007 16:13	2007	2007	1.00
29-SEP-2005	05-OCT-2005	10/02/2005 0:16	2005	2005	1.89
24-APR-2009	26-APR 2009	04/24/08 3:55:00	2008	2009	2.00
15-APR-2009	24-APR-2009	04/22/08 08:23:00	2008	2009	2.00
27-MAR-2009	30-MAR-2009	03/28/08 05:12:00	2008	2009	2.00



InstitutionFrom	AdmittedFrom	institutionfrom_CONCAT_admitfrom	IFjiveswithAF
038 Central NF Regional Health C	2 Home	038 Central NF Regional Health C2 Home	NO
038 Central NF Regional Health C	2 Home	038 Central NF Regional Health C2 Home	NO
023 Central NF Regional Health C	2 Home	Q38 Central NF Regional Health C2 Home	NO
035 Nain Nursing Station	3 Hospital/Health Centre	D35 Nain Nursing Station 3 Hospital/Health Centre	YES
032 Labrador South Health Centre	No Entry	032 Labrador South Health CentreNo Entry	NU
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linked	51 OBS Delivered	54 Newborn	HI007079/07	HI007079/07
error in baby link	51 OBS Delivered	54 Newborn	HI008432/02	HI008421/02
HI000902/01	51 OBS Delivered	54 Newborn	HICC0902/01	HI00902/31
HI000902/01	filter out	54 Newborn	HI00902/01	HI00902/01
HI000091/02	51 OBS Delivered	54 Newborn	HI000091/02	HI00091/02
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HI001266/03	filter out	54 Newborn	hi001266/03	hi001266/03
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Quality Assurance







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.1 2 Of this amount, more than three quarters (about 76 per cent) is spent for hospitals and other institutions, physicians' fees and drugs 3 Hospital costs include expenditures such as nurses' salaries.

Perinatal

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



Final Points

 Accurate surveillance contributes to our knowledge of the possible causative factors and impact of preventive measures on the burden of in



erinatal

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



Perinatal Program



Thank You for Listening



Perinatal

Questions?





Perinatal Program

Phil A. Murphy, MSc. phil.murphy@easternhealth.ca Clinical Epidemiologist - Perinatal Program Newfoundland Labrador Professional Associate - Memorial University (Ob/Gyn, Pediatrics)

Janeway Children's Health and Rehabilitation Centre 300 Prince Philip Drive St. John's, NL Canada A1B 3V6 Tel 709-777-4867 Fax 709-777-4125 www.ppnl.ca.ca