



Finding the Ultimate MPH Practicum Placement

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Quick Poll

How do you apply for your practicum placements?

Finding my MPH Practicum Placement

What do you want to get out of your practicum?

- Define the goal of your practicum
- Identify areas you need to improve on

What are your interests?

- Private vs. Public Sector
- Rural vs. Urban setting
- Public Health, Global Health, Environmental Health, etc.

My Practicum Placement

- **Location:** Yellowknife, NT
- **Organization:** Population Health Division, Department of Health & Social Services, Government of the Northwest Territories
- **Preceptor:** Territorial Epidemiologist
- **Project:** Immunization Coverage Analysis in the NWT, and Audit of the NWT Immunization Registry

Deliverable for Western



Vaccination under the Midnight Sun: Validation of an Immunization Registry in the Northwest Territories

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Vaccination under the Midnight Sun: Validation of an Immunization Registry in the Northwest Territories

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Background

In 2012 the Northwest Territories' (NWT) Public Health Act mandated that all health care providers report immunizations administered in the territory to the Chief Public Health Officer. The Immunization Registry was thus established to provide an electronic record of all immunizations reported to the Office of the Chief Public Health Officer (OCPHO). After the introduction of the Immunization Registry, each community health centre was required to submit a spreadsheet at the end of each month indicating all vaccine events. The health centres were obligated to record and report the information outlined in the NWT Public Health Act, including health care number, name, date of birth, gender, date of immunization, vaccine name, vaccine brand, manufacturer, lot number, route of immunization, site of immunization, immunization series, and volume/quantity of immunization. Monthly Excel spreadsheets comprised of vaccine events are submitted from the community health centres to the OCPHO to form the NWT Immunization Registry. An audit of the original Excel spreadsheets submitted to the OCPHO was conducted to determine the data quality and completeness of the NWT Immunization Registry.

Method

To assess the validity and reliability of the Immunization Registry, the community health centres were contacted and asked to fax all immunization records for the cohort of children born between 2012 and 2014, inclusive. The immunization records received were then compiled into an Excel spreadsheet. This cohort spreadsheet was used as the 'truth' comparator in determining the errors and missing vaccination events within the existing Immunization Registry. Together the errors and missing vaccination events formed the discrepancies depicted in Figure 1. Figure 2 highlights the process of comparing the physical immunization records collected from the communities (gray) and the original spreadsheets submitted to OCPHO on a monthly basis (purple).

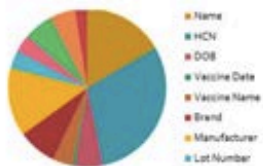


Figure 1: Proportion of all Discrepancies by Immunization Registry Variable



Figure 2: Process of auditing the existing NWT Immunization Registry

Key Issues

The NWT Immunization Registry was not designed to track immunizations administered outside the NWT. Unfortunately, individuals that have been partially immunized outside of the NWT contribute to the registry's dataset with incomplete records. Furthermore, the young and mobile NWT population poses challenges in maintaining high quality data within the existing Immunization Registry. Quality data and completeness is important to determine the efficacy of vaccines and uptake of territorial vaccine programs. Furthermore, quality data is critical for appropriately allocating communicable disease program funding.

Common Errors

- Name: Middle names included/excluded and hyphenated names
- Health Card Number (HCN): Non-NWT HCN, and not up to date HCN
- Dates: Incorrect format (MM-DD-YYYY)
- Brand: Incorrect brand or multiple brands (ex: MMR II vs PRIORIX or VARIVAX II vs VARILRIX)
- Manufacturer: Incorrect or mismatch with brand (ex: Wyeth vs Pfizer)
- Route: Inappropriate for particular vaccination
- Inappropriate use of "N/A" across all variables
- Child not yet registered in health insurance registry

Results

Over 22,000 vaccination events were audited for the cohort of children born between 2012 and 2014, inclusive. A total of 17500 paper records were collected, of which 12000 (42%) were missing from the NWT Immunization Registry. The discrepancies between immunization cards and Excel reports to the OCPHO are highlighted by variable name and region (Table 1). The discrepancies table demonstrates the quality of data among the cohort studied in the NWT's Immunization Registry: The discrepancies among the demographic variables vary from a low of 14% (date of birth (DOB)) to a high of 74% (HCN) while the discrepancies vary in the vaccine specific variables from 2% (Vaccine Date) to 44% (Manufacturer).

Recommendations

In the absence of implementing an immunization information system, updating the current monthly immunization spreadsheet to eliminate free text entry options and limiting entries to a drop-down list for all discrete variables should decrease errors within the NWT Immunization Registry by approximately 10% within vaccine name and up to 44% within manufacturer. Figure 1 identifies that name and HCN are the most vulnerable variable within the NWT Immunization Registry. Similarly, by linking the NWT health insurance registry with the NWT Immunization Registry, the quality of patient demographic data within the NWT Immunization Registry would improve significantly, essentially eliminating the 40% discrepancy in the name variable and 74% discrepancy in the HCN.

Region	Total records	Name	HCN	DOB	Vaccine Date	Vaccine Name	Brand	Manufacturer	Lot Number	Route	Site	Series	Quantity
Region A	571	85.2%	33.6%	15.7%	2.2%	19.6%	36.6%	34.7%	13.7%	12.0%	12.2%	11.2%	11.2%
Region B	1770	80.4%	33.0%	15.8%	1.0%	19.6%	19.0%	13.0%	8.0%	4.4%	11.0%	10.0%	8.0%
Region C	402	45.0%	51.5%	13.7%	3.4%	21.4%	25.0%	22.0%	12.0%	8.0%	14.0%	8.0%	9.0%
Region D	736	88.0%	30.0%	15.0%	1.0%	21.0%	17.0%	11.0%	7.0%	7.0%	10.0%	10.0%	5.0%
Region E	1220	77.0%	31.0%	1.0%	1.0%	8.0%	11.0%	22.0%	9.0%	1.0%	12.0%	14.0%	7.0%
Region F	171	35.0%	11.0%	5.0%	1.0%	12.0%	10.0%	10.0%	10.0%	10.0%	10.0%	4.0%	5.0%
Region G	197	12.0%	16.0%	15.0%	1.0%	3.0%	25.0%	12.0%	8.0%	5.0%	11.0%	8.0%	4.0%
TOTAL	2526	62.0%	32.0%	13.0%	1.8%	9.8%	22.0%	17.0%	10.0%	10.0%	11.0%	10.0%	7.0%

Table 1: Total Discrepancies by Region and Immunization Registry Variable

Acknowledgements

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Conclusion

The audit of the existing registry identified the challenges of obtaining quality data in public health without an information system. Errors in the Immunization Registry make it challenging to determine coverage and establish an accurate estimate of the territories vulnerability to vaccine preventable diseases. Without a reliable and linked Immunization Registry, the NWT will have to continue to conduct regular annual audits to ensure that the Registry is accurate and complete.

appropriately allocating communicable disease program funding.



Report to OPHO

Figure 2: Process of auditing the existing immunization registry in the NWT

Findings

Tables 1 and 2 demonstrate the quality of data in the NWTs immunization registry. Table 2 further emphasizes their need for a new information system in hopes of minimizing errors in the registries unique identifier.

Conclusion

The audit of the existing registry identified the challenges of obtaining quality data in public health. The more errors in the immunization registry the more challenging it is to establish an accurate estimate of the territories vulnerability to vaccine preventable diseases.

Deliverable for Organization

NWT Immunization Coverage- 2012 Birth Cohort
Internal Report: Not for Distribution



Immunization Coverage among the 2012 Birth Cohort in the Northwest Territories

Introduction

Immunization, the process of administering a vaccine to stimulate the body's immune system to protect against subsequent infection or disease, is a proven, cost-effective tool for controlling life-threatening infectious diseases and is estimated to prevent two to three million deaths each year worldwide.¹ Despite the huge reduction in morbidity and mortality caused by these diseases in Canada, a drop in vaccine coverage in the population can lead to a resurgence of these diseases, as exemplified by recent measles outbreaks in the country.²

Measuring immunization uptake (coverage) helps determine if a population is vulnerable to vaccine-preventable diseases. Achieving high immunization coverage rates is important due to the concept of herd immunity, whereby individuals who are unable to be immunized are indirectly protected by the immunized herd, since the probability of disease transmission decreases as more people are immunized.³

All of the vaccines in the Northwest Territories (NWT) immunization schedule for children up to the age of two. (Table 1) are publicly funded and recommended, but parents do have the option to decline.

Table 1: NWT Immunization Schedule and Spacing

Vaccine Series	Diseases protected against	Doses	Minimum age for 1 st dose	Minimum interval to next dose	NWT schedule
DTaP-IPV-Hib	Diphtheria, pertussis, tetanus, polio and <i>Haemophilus influenzae</i> type b	4	6 weeks	4 weeks 4 weeks 6 months and at 212 months age	2 months 4 months 6 months 18 months
Hepatitis B	Hepatitis B	3	Birth	4 weeks 8 weeks* --	Birth 1 month 6 months
Meningococcal C conjugate	Meningococcal meningitis	2	8 weeks	8 weeks** --	2 months 12 months
*MMRV	Measles, mumps and rubella	1 ¹ or 2	12 months	2 years	12 months 36 months
Pneumococcal conjugate	13 types of pneumococcal bacteria	4	6 weeks ¹	4 weeks 4 weeks 8 weeks --	2 months 4 months 6 months 18 months
BCG	Tuberculosis	1	Birth	--	Birth

* There must be 4 months (16 weeks) between the first and third doses of Hep B.

** Second dose of Men-C must be given at 212 months of age.

¹ One dose of MMRV is equivalent to one dose of MMR and one dose of Varicella.

² Children receiving their first dose of pneumococcal conjugate at 7 to 11 months of age require 3 additional doses, with the first two doses at least 4 weeks apart, and at least 8 weeks between the 3rd and 4th dose, and the 4th dose must occur 212 months of age. Children receiving their first dose at 12 – 23 months of age only require two additional doses 8 weeks apart.

³ BCG is offered to all children, but with emphasis on Aboriginal and immigrant children living in families or communities outside of Yellowknife.

NWT Immunization Registry Audit 2015
Internal Report: Not for Distribution



Audit of the Northwest Territories Immunization Registry, 2015

Introduction

In 2012 the NWT Public Health Act mandated that health care providers report all immunizations administered in the territory to the Chief Public Health Officer. Shortly after the immunization registry was established to provide an electronic record of all immunizations administered throughout the territory. Each community health centre (CHC) was then required to submit an Excel spreadsheet at the end of each month indicating all vaccines they administered.

Immunization coverage analysis helps the DHSS determine how well protected the NWT is from vaccine-preventable diseases. The analysis also helps evaluate the effectiveness of programs in the different communities, as well as the parental perspective of immunization. High rates of immunization coverage in a community present the opportunity for that community to reach a herd immunity, whereby individuals who did not receive their immunization will be protected by the rest of their community who have been immunized. The concept of herd immunity exists due to the fact that the probability of disease transmission decreases with an increase in the number of individuals who are immunized (Public Health Agency of Canada, 2010).

The immunization audit was intended to evaluate the data quality of the monthly spreadsheets submitted by the CHC's between 2012 and 2014 inclusive, for the cohort of children born between 2012 and 2014 inclusive.

Methods

Sample selection: The audit contained vaccination data collected in 2012, 2013 and 2014 for children born in 2012, 2013 and 2014. The data was composed of seven publicly funded vaccines including BCG; diphtheria, tetanus, polio and *Haemophilus influenzae* B (DTaP-IPV-Hib); hepatitis B; measles, mumps, rubella and varicella (MMRV); meningococcal C conjugate and pneumococcal conjugate.

Vaccination data sources: There were three vaccination data sets that were used during this audit. Firstly, the original community spreadsheets submitted by the CHC's to the DHSS. Secondly a spreadsheet comprised of all paper vaccination records submitted to the DHSS. Lastly, the Northwest Territories Immunization Registry (NIR) dataset that is comprised of vaccination data collected electronically from CHC's, and corrected by the DHSS Senior Disease Registry Officer. The corrections are made through coordination with the CHC's, via fax, email and telephone. The NIR is considered the most accurate dataset due to the data quality checks and corrections. The community data was first compared against the paper data to flag discrepancies and missing vaccination records. Next it was compared against the NIR to identify any missing vaccination records that the Senior Disease Registry Officer identified during data checking.

Date manipulation and analysis: The variables included in the audit included: name, health care number (HCN), date of birth (DOB), date of vaccination, vaccine name, brand, manufacturer, lot number, site of injection, route, series, and quantity. Due to changes to dropdown lists in the NIR Excel form over time, data for some variables were standardized prior to comparison between the two vaccination data sources. For example, for the vaccination route variable, all fields with "IM" were replaced with "INTRAMUSCULAR". Although the

