

UNDER THE MICROSCOPE: MANITOBA'S PROVINCIAL LAB DATA

A summary of the report, A Systematic Investigation of Manitoba's Provincial Laboratory Data, by Lisa Lix, Mark Smith, Mahmoud Azimaee, Matthew Dahl, Patrick Nicol, Charles Burchill, Elaine Burland, Chun Yan Goh, Jennifer Schultz, Angela Bailly

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Cadham Provincial Lab data: A good opportunity for MCHP researchers

Do you want better information about health and health services in Manitoba? We do. That's why we look for new sources of information for research opportunities. Recently, a wealth of Cadham Provincial Lab data became available to the Manitoba Centre for Health Policy (MCHP). Now, Manitoba researchers can use more than 12 million provincial lab records that are new to the Data Repository housed at MCHP.

Set up in 1897 by Provincial Bacteriologist Dr. Graham Bell, the Cadham Provincial Laboratory

(CPL) has been Manitoba's public health lab for more than 100 years. With services including testing for bacteria, viruses and viral diseases, and other blood tests, CPL focuses on preventing, detecting and monitoring human diseases.

Notifiable diseases are diseases that,

by law, need to be reported to public health authorities. These are diseases like tuberculosis, hepatitis and syphilis. Notifiable disease data are usually used to monitor and detect outbreaks. When these data are anonymized and then linked with other administrative health databases, fresh new opportunities are created to better understand the health of Manitoba's population and public health service use.

But the quality of the data we get is very important to us because we want to be sure we have accurate information. Good quality data can be used by decision-makers to set up programs. And if we have estimates that aren't accurate, we'll have trouble identifying where programs might be needed. If you were the CEO of a hospital or in charge of a provincial health region, you'd want to be sure you could get good quality data to help you make smart decisions about issues like managing patient wait times and detecting outbreaks of diseases.

This study looks at the quality and uses of CPL data from 1992 to 2010. After all, when the provincial lab's information system was first set up, no one imagined that the data might one day be added to the Repository to be used for research. But this study also gave MCHP a good opportunity to look at better ways to manage and evaluate the way in which all new databases are brought into the Repository—a sort of "recipe" for acquiring data.

Working with the CPL data

We didn't look at whether a particular test result was correct. When a blood sample is sent to the provincial lab for a test, the lab has processes set up to make sure that the result that is sent back to the physician is correct. The lab then puts all those results into a large data-storage system. When patients are sent home from the hospital, a summary of their hospital stay is kept in a database. These are examples of administrative data.

Administrative health data are created to help managers and administrators run the healthcare system. Because of this, the data aren't always suitable for research. The Repository was set up to describe and explain patterns

When notifiable diseases are linked with other administrative health databases, new opportunities are created to better understand the health of Manitoba's population and health service use. of healthcare service and to be used for research. The Repository has been growing quickly in the last few years and more researchers are using it. Finding the best ways to help MCHP researchers use and understand the data in the Repository is important to keep Manitoba at the

leading edge of health research. With better information and better ways to manage this information, we can make better decisions about healthcare in our province.

To decide whether the data can be used for research, some critical questions need to be answered:

- Do the data we received accurately measure what they were meant to measure?
- How current are the data for decision making?
- How easily can we understand, access and interpret the data?
- How well does the data meet the current and future needs of researchers?

We looked at the percentages of valid, invalid and missing details in the CPL data. We also checked to see if requisitions and tests for the different lab service sections changed over time.

The completeness of coverage of the entire Manitoba population was also studied, using things like age, sex and region of residence. We then did the same assessment for the prenatal population in Manitoba because we know that testing women for infectious diseases is important to promote healthy births. That's why blood tests for hepatitis and sexually transmitted infections (STIs) are routine for pregnant women.



All these assessments of the CPL data are important for a better understanding of healthcare use and health outcomes of Manitoba's infectious disease populations.

What we learned

We wanted to find out how accurate and consistent the records from the provincial lab are. We also wanted to determine if we can use the CPL data for finding selected communicable disease groups in Manitoba. MCHP researchers found that the records available from CPL are high quality, with only small amounts of invalid or missing details. Good practices and strong record keeping at CPL over a long period of time have resulted in lots of valuable information that we can use to help us understand public health issues that are important to our province.

We also wanted to see if the CPL records can be linked with other administrative health databases (for example, hospital and physician billing databases). We found that most of the records in the CPL data can be linked to other databases. In fact, we were able to link more than 80% of all the records (apart from serology records) using anonymized personal health numbers.

We did find some changes in program delivery or in the way the records were noted over time. For example, there was a large increase in serology tests (the study of blood serum) in overtime, while the percentages stayed mostly unchanged over the study period for virus detection and parasitology tests. One key finding in the CPL data is that there was consistent use of routine screening tests for pregnant women throughout the study period, across different regions of the province and in different population and income groups (Figure 1). This suggests that we now have good data we can use for studying healthcare use during pregnancy.

We also looked at the percentages of the population having at least one lab test, and then compared the numbers for rural and urban income levels (Figure 2). As we expected, we found that the testing rates were highest for the lowest income groups and lowest for the highest income groups.

What does this tell us? These results show that people in lower income groups, who are often more at risk, are getting tested for infectious diseases more often than people with higher incomes do. And for the Manitoban population, this is a good thing.

Another key finding of this study is that notifiable disease testing data—like positive tests for chlamydia and other sexually transmitted infections—might not always agree with the details we get from hospital records and doctor's billing claims. This finding warns researchers to be careful about relying on a single source of health information to study infectious diseases. More accurate results come from using more than one type of data. This is something we have known for some time.





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Looking at data quality

So we know that the quality of the data we get and use is important, because it gives us good information that can be used to make smart decisions about healthcare. High quality data also lets us link information from different sources to get a fuller picture of the story. But how do we determine that we have good health information?

At MCHP, we set up a six-step data management process and quality framework as part of this study (Figure 3). Then we tested it with the data from CPL.

We used these six steps to create a better, clearer system for managing all new data coming to MCHP.

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Looking at rates of testing for

Next, we found different ways to describe data quality by looking

at how other organizations, like the Canadian Institute for Health Information, define quality. Then using our framework for data quality, we built new tools to describe quality. We used these tools to create a data quality report card for the CPL data. This report card can now be created for any of the datasets in the Repository.

These are just some of the tools and methods we use to manage data and to help us understand the quality of the

Figure 3: The Six-Step MCHP Data Management Process



health data, in our role as keepers of provincial health information.

Where we can go from here

So what's next? How can we build on this opportunity now that we have the CPL data in the Repository? Using MCHP's six-step data management process and the quality framework for this study helped us come up with some key suggestions.

Let's get researchers and decision-makers excited about the many new opportunities to link notifiable disease data

> to other administrative health data. For example, looking at rates of testing for STIs in teens could help us learn about the success of STI awareness programs.

Next, we can develop some examples of data quality studies to help promote

this unique type of research in Canada and around the world. Case studies about the quality of administrative databases, like medical records, can help researchers better understand how these data can be used for other health studies.

Then we can also create a standard for assessing the quality of database records to help us correctly understand and interpret administrative health data. For example, information about any changes in the way CPL testing was handled would help us figure out the changes in testing rates over time.

This project has shown that the Repository at MCHP has a new and valuable tool, the CPL data, for public health and other health services researchers to use. We successfully linked this new resource to other data in the Repository and showed that this process works well.

This project also developed a process that allows MCHP to make sure that all new data sets that are added to the Repository in the future are telling us what we think they are telling us. And with this information, we can find new and creative ways to help us make better decisions about healthcare in Manitoba.

For more information, contact MCHP: Tel: (204) 789-3819; Fax: (204) 789-3910; Email: reports@cpe.umanitoba.ca or visit umanitoba.ca/medicine/units/mchp

