

A New Approach to Improve Laboratory Data Accessibility

Lily Nguyen, Chenyu Zhang, Angela Li, Jing Luo
Vancouver Coastal Health

1. Background

“Laboratory tests are well documented to contribute to healthcare waste, with **an estimated 30% to 50% of tests for hospitalized patients being unnecessary.**”

-- Yarbrough, P et al. (2016). *J. Hosp. Med.* 11(5):348-354

As appropriateness and value of care become increasingly important in healthcare, there is a **growing demand to analyze lab ordering patterns and to support data-driven decision making.**

However, laboratory data has historically been isolated from the rest of healthcare datasets and analyzed separately.

2. Issues

The sheer **volume and complexity** of lab data has posed a huge barrier to maintaining data quality during the data extraction/loading process. There are approximately **50,000 lab tests done per day at VGH** alone.

Lack of dedicated teams with both laboratory and data analytic knowledge

3. Aim

Assure the **availability of quality laboratory data** through development of a robust data validation methodology

4. Approach



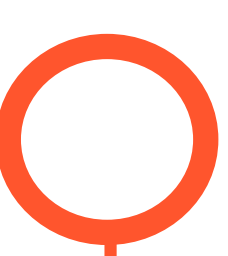
Bring together a **working group** that consists of: laboratory technicians (with both clinical expertise and data knowledge), data advisors, data warehouse administrators



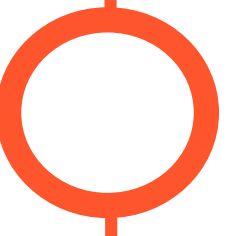
Narrow down the **scope** of validation (target the most utilized lab tests and the most desired data fields)



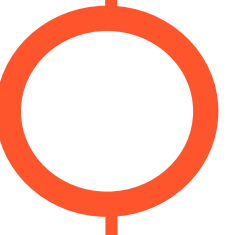
Set up a **temporary SQL database** with laboratory data extracts, which will be used to compare with the source data



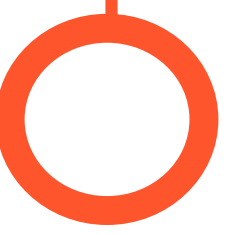
Compare **front-end data** (i.e. what users see when downloading the data) and **back-end data** (i.e. extracts that the lab system generates) to **isolate discrepancies**



Calculate the **marginal effect** of the discrepancies for each data field using data processing tools, such as **R**, and data exploration tools, such as **Tableau**



Work with the clinicians to **investigate the causes** of high discrepancies in high impact fields



Repeat the process until the dataset achieves **98% accuracy** as compared to the source of truth



Work with the data infrastructure team to build the laboratory datasets into a system that is **accessible** by analytics teams to use **for quality improvement** projects

5. Achievements

909,491

laboratory records validated

1.5 months

to develop the methodology and complete validation

Results of
80 tests

out of approximately 300 are now easily accessible to use in data analysis

6. Lessons Learned

Interdisciplinary collaboration and **agile methodology** are required to correctly interpret clinical data.

The importance of **advanced planning** and **proactive engagement** with various teams across the organization.

Working Group Members

Vivian Chan, Director, Medical Quality VCH/PHC – vivian.chan@vch.ca; **Jing Luo**, Manager, Medical Quality VCH/PHC – jing.luo@vch.ca; **Lily Nguyen**, Advisor, Medical Quality VCH/PHC – lily.nguyen@vch.ca; **Chenyu Zhang**, Advisor, Medical Quality VCH/PHC – chenyu.zhang@vch.ca; **Lawrence Sham**, Technical Coordinator, Transfusion Medicine; **Decision Support at Vancouver Coastal Health**