A New Approach to Improve Laboratory Data Accessibility

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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."

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

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