Facilitating Public Health Action through Surveillance Dashboards

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Objective

To address the limitations of traditional static surveillance reporting by developing in-house infrastructure to create and maintain interactive surveillance dashboards.

Introduction

Traditionally, public health surveillance departments collect, analyze, interpret, and package information into static surveillance reports for distribution to stakeholders. This resource-intensive production and dissemination process has major shortcomings that impede end users from optimally utilizing this information for public health action. Often, by the time traditional reports are ready for dissemination they are outdated. Information can be difficult to find in long static reports and there is no capability to interact with the data by users. Instead, ad hoc data requests are made, resulting in inefficiencies and delays.

Use of electronic dashboards for surveillance reporting is not new. Many public health departments have worked with information technology (IT) contractors to develop such technically sophisticated products requiring IT expertise. The technology and tools now exist to equip the public health workforce to develop in-house surveillance dashboards, which allow for unprecedented speed, flexibility, and cost savings while meeting the needs of stakeholders. At Alberta Health Services (AHS), in-house, end-to-end dashboard development infrastructure has been established that provides epidemiologists and data analysts full capabilities for effective and timely reporting of surveillance information.

Methods

An internal assessment of the available resources and infrastructure within AHS was conducted to iteratively develop a new analytics model that provides a foundation for in-house dashboard development capacity. We acquired SAS® and Tableau® software and conducted internal training for skills development and to transition staff to the new model. This model is highlighted below using our respiratory virus surveillance (RVS) dashboard as an example.

For the RVS dashboard, stakeholder engagements were conducted to understand the end users' needs. Next, data access was improved, where possible, by securing direct access to source data (e.g. emergency department visits for influenza like illness (ILI), Health Link calls, hospital admissions, etc.) on existing database servers. SAS® code was written for routinely connecting with multiple data sources, data management and analysis, data quality assurance, and posting summary data on a secure Oracle® server.

The Tableau® dashboard development application was then used to connect to the summary data on the Oracle® server, create the interactive dashboards and publish the final products to the AHS Tableau server environment. Key users were consulted in the iterative development of the interface to optimize usability and relevant content.

Finally, the product was promoted to stakeholders with a commitment to use their feedback to drive continuous improvement.

Results

In-house generated surveillance dashboards provide more timely access to comprehensive surveillance information for a broad audience of over 108,000 AHS employees; within as little as 3 hours of all data being available. They facilitate user-directed deep dives into the data to understand a more complete surveillance picture as well as stimulating hypothesis generation. Additionally they enhance productivity of personnel, by significantly reducing response times for ad hoc request and to generate reports, freeing up more time to respond to other emerging public health issues.

Looking specifically at the RVS dashboard, its ability to bring all relevant surveillance information to one place facilitates valuable discussions during status update meetings throughout the influenza season. Among other things it has allowed Medical Officers of Health, emergency department staff, epidemiologists and others to make informed decisions pertaining to public messaging, the need for reallocating resources, such as staffing and handling the burden of ILI patients, as well as determining the necessity of opening influenza assessment centers.

Conclusions

Surveillance dashboards can facilitate public health action by assembling comprehensive information in one place in a timely manner so that informed decisions can be made in emerging situations.

Keywords

Surveillance; dashboards; Respiratory Virus Surveillance

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