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ISDS INTERNATIONAL SOCIETY FOR DISEASE SURVEILLANCE

Novel and Nontraditional Data Streams: Where Do They Fit into Biosurveillance Action?

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Objective

To gather thought leaders in informatics, public health practice, surveillance research, and strategic decision-making to provide their insights into where and how to effectively integrate novel data streams, such as social media, into biosurveillance (BSV) systems and standards of public health surveillance practice.

Introduction

Public health surveillance relies on multiple systems and methodologies for data collection, analysis, and interpretation. Each component provides only part of the picture, such as detection of possible outbreaks or events of concern; geographic profiles or time courses of disease activity; or indicators of clinical severity by age, risk factors, etc. Novel, unstructured data sources like Twitter feeds and aggregated news reports are growing as a source of information about health and disease. What and where are the contributions of these nontraditional, often non-specific, data types to BSV?

The answer will depend on the purpose and target population. Different data streams often have greater utility for one BSV function (e.g., outbreak detection) than another (e.g., situation awareness). Furthermore, public health agencies at different levels need and use data differently, as determined by their priorities for public health. New types of data can also be useful for disease prediction and forecasting, pandemic modeling, and developing analytic tools.

Before any new data modality can be integrated into standards of surveillance practice, it needs to be evaluated for its contribution to understanding disease activity and the value added when compared to other sources of data with regard to validity, timeliness, accuracy, representativeness, and positive and negative predictive values. Furthermore, questions remain about when novel, unstructured, or nontraditional data sources are acceptable evidence to inform decision-making and public health actions. To address this, the strengths and weaknesses of different types of data for various surveillance functions need to be discussed among stakeholders that bring various perspectives from surveillance research, practice, and policy.

Methods

This panel convenes an interdisciplinary group of nationally recognized experts in biosurveillance to provide their perspectives on integrating novel data sources into standards of practice for various BSV functions by public health agencies at different levels.

The discussion will focus on the utility of novel, electronic data sources (e.g., social media, news, web site and search-term queries, consumer transactions) that generally originate outside of traditional healthcare and public health channels.

The panel agenda was developed collaboratively by the moderators and presenters. Dr. Dasey will begin the presentations with a discussion of the challenges of evaluating technologies that try to exploit novel data streams, and relate them to his experiences in approaching similar problems in other domains, particularly the challenge of effectively using less certain information in a decision-making process. Dr. Hopkins will provide a historical perspective on the steps needed to add a novel data source to routine surveillance business practice. Dr. Corley will speak to innovations in data analytics, such as improved anomaly detection, and how they are advancing the science of event-based disease surveillance. Finally, Dr. Bennett will discuss how data sources are being used in a framework for integrated biosurveillance at the federal level. The panel presentations will be used as a springboard for interactive discussion with the audience.

Results

To engage the audience and exchange information with the panelists and each other, the moderators will use an audience response "clicker" system to collect answers to questions posed by both the panelists and the audience. Answers will be compiled and presented to provide context for the panel's comments and a catalyst for further discussion. In alignment with the theme of the 2013 ISDS conference, the desired outcome is to identify priorities for research and evaluation needed to advance the integration of novel surveillance methodologies into standards of BSV practice.

Keywords

social media; data streams; situation awareness; outbreak detection; web-based

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