Contagion: Optimizing Foodborne Outbreak Analysis with Automatic Suggestions

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Problem

Small multiple and linked view systems have many controls and filters, creating a complex experience. Given a new user to Contagion, can Contagion suggest filters and views of the dataset that will help her data analysis?

Motivation

There are hundreds of foodborne outbreaks a year, with 1/6 Americans affected. All people are entitled to information about their foods, yet providing a visualization that caters to all sets of users is challenging.

Methods

1. Create v1 Contagion website
2. Data Collection
3. Rule-based Data Generation
4. Learning from Data
   Collaborative Filtering
5. Create v2 Contagion website that uses v1 Contagion user data

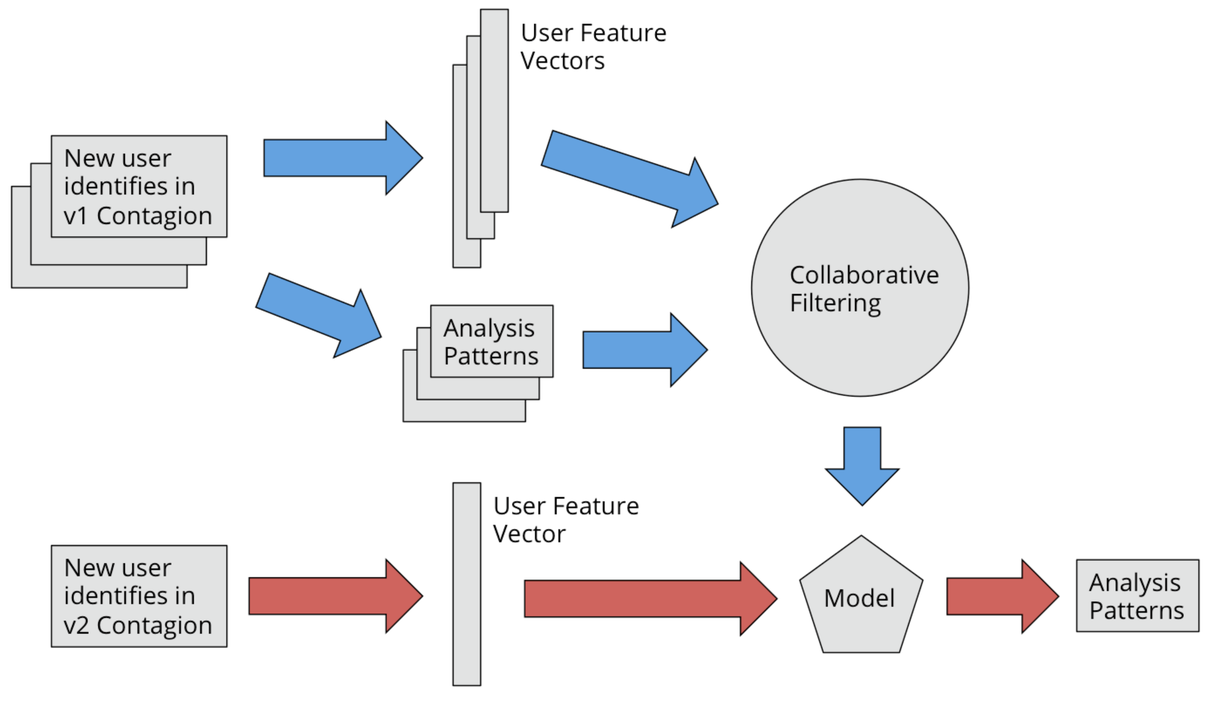

Figure 1. Information flow chart for Contagion v1 and v2.

Results

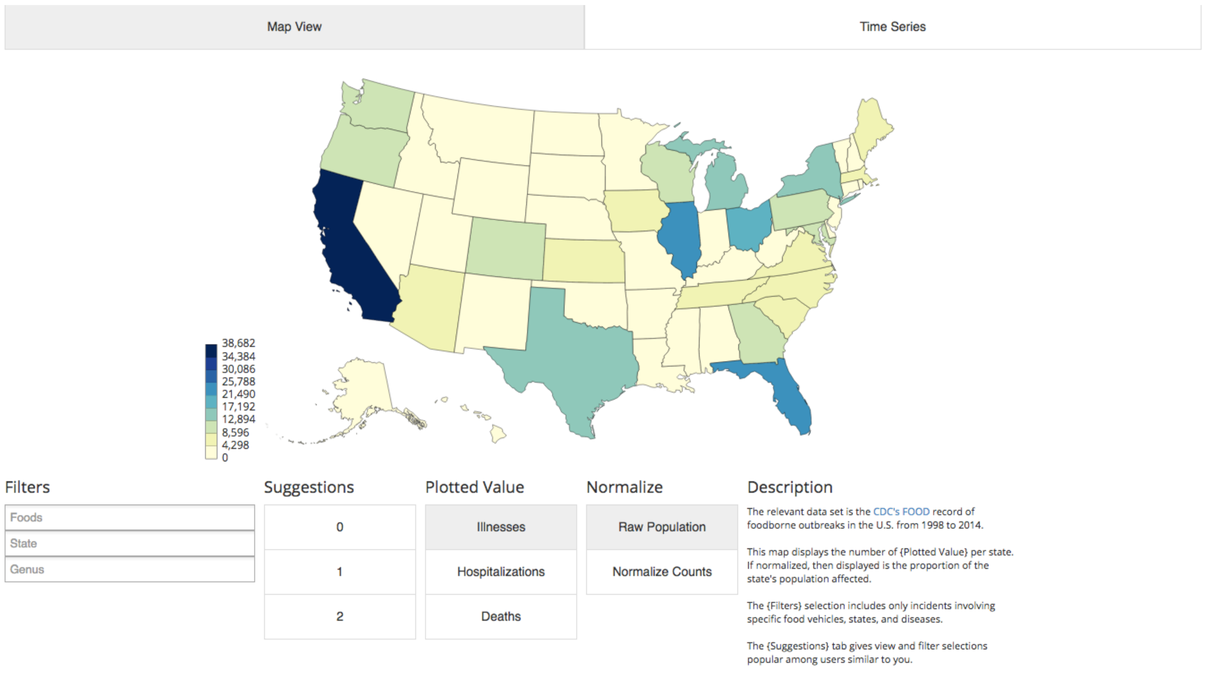

Figure 2. Choropleth map of foodborne outbreak illnesses in the United States. Contagion offers suggestions and certain features not available in the existing CDC FOOD tool.

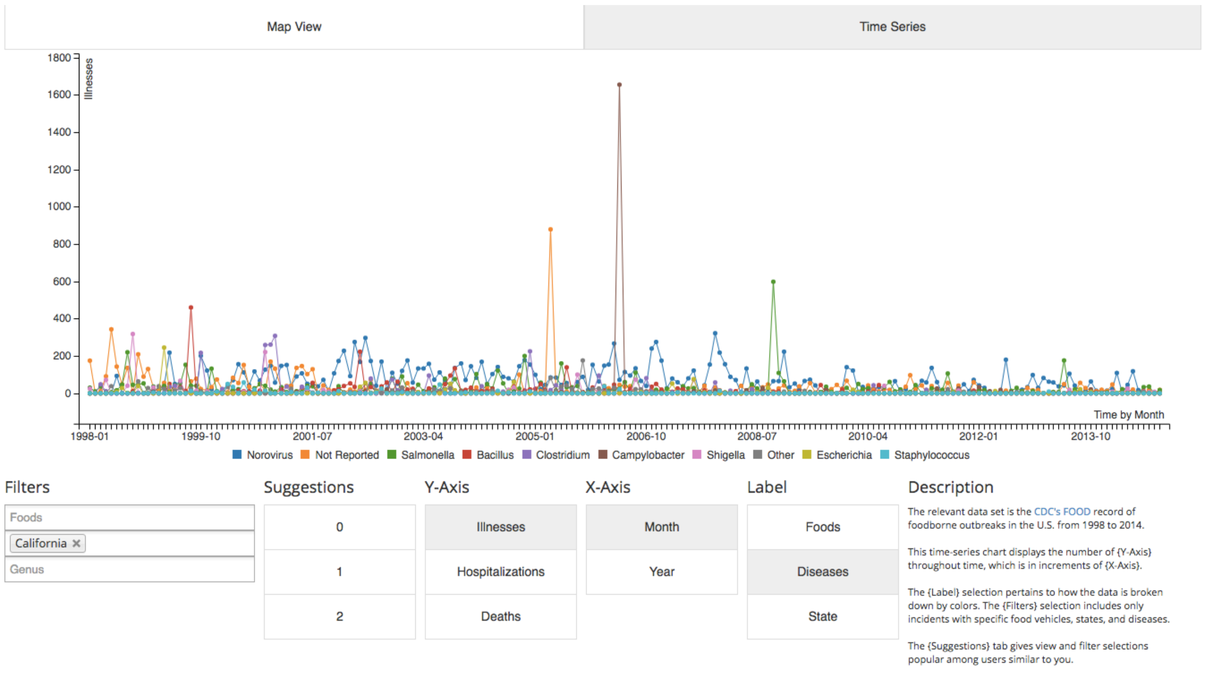

Figure 3. Time-series chart of disease genera in California over time. This is an automatic suggestion for a doctor practicing in California, who may well be interested in such a chart.

Future Work

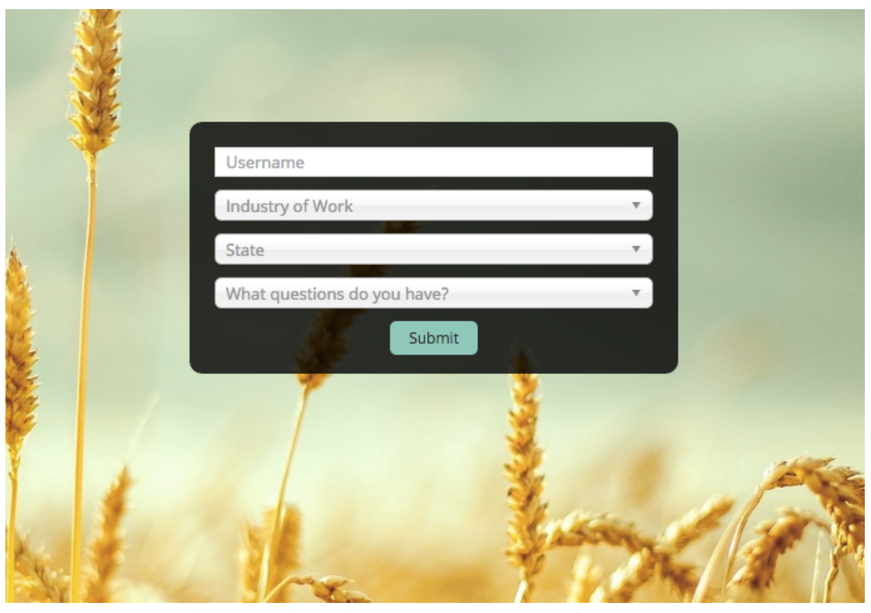

Figure 4. The self-identification form in Contagion. A future work may be to draw user data automatically, instead of manual entry.

- Employ real user data to inform machine learning algorithm in v2 Contagion.
- A/B Testing between suggestive and non-suggestive system, to examine the efficacy of a data visualization system with suggestions.
- Streamline user experiences by predicting and hiding filter controls that will likely not be used by the end user.
- Scented suggestion widgets to give a hint of the suggestion or its relevance for the user.