

Interactive visualisation of animal health surveillance data - information for action

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Summary

Google Maps and Google Charts are powerful and easily accessible tools for **interactive** and **real-time reporting of surveillance data**.

The use of these or similar tools should be encouraged to support **timely dissemination** and **quick interpretation** of surveillance data to improve the use of such data for human and animal health action.

Introduction

Early detection of disease outbreaks or changes in the frequency of infection in animal populations plays a vital role in reducing the impact of emerging and endemic zoonotic diseases. Mapping and charting of surveillance data is common but generally is neither real-time nor interactive. However, both are of importance for timely result dissemination and interpretation allowing for an early detection of aberrations.

Objective:

To develop web applications for different types of Swiss animal health surveillance data to improve early detection of outbreaks through interactive and real-time display of the data.

Results & Discussion

Google Charts and Maps were an effective tool for the interactive visualization of the two data sets. Both Google libraries provided a range of features from entry-level usage without or minimal programming skills up to complex usage scenarios.

Interactive reporting dashboards, which allow practitioners and decision-makers to **explore the data** or to **layer information**, provide a **progression from static, image based data visualizations**.

In particular the web-based approach, the ability to connect to different data sources as well as the separation of data and presentation layer provide opportunities for surveillance data visualization.

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Methods

Google Maps and Charts are widely available, multi-device capable and very powerful software tools for visualization of data.

They were applied to two different datasets from the Swiss Federal Food Safety and Veterinary Office:

- post-mortem meat inspection data and
- data from a web-based surveillance system for equine diseases.

For the first dataset, the Google Charts Library was used to build an **interactive reporting dashboard** with controls to filter by species (cattle, pigs, small ruminants) and years. Depending on the filter chosen, a smoothed bar chart and data table were displayed which **updated dynamically** to display the carcass condemnation rate for the selected year and species. The bar chart could be overlaid with either previous or adjunct years, which allowed for a **visual comparison**. In addition, the Google Charts annotation feature was used to show aberration detection flags.

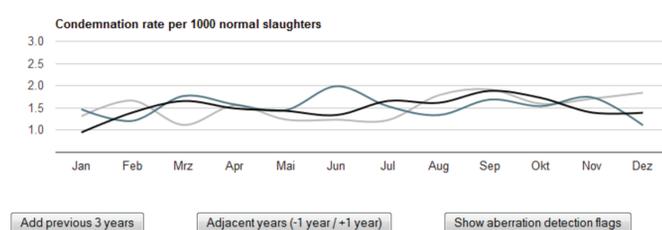


Figure 2: Reporting dashboard displaying condemnation data

For the second dataset Google Maps in combination with grouped bar charts were utilized to report on syndromes and diseases in horses in space and time. The reporting dashboard allowed to **filter against various parameters**, e.g. specific symptoms or the time period displayed.

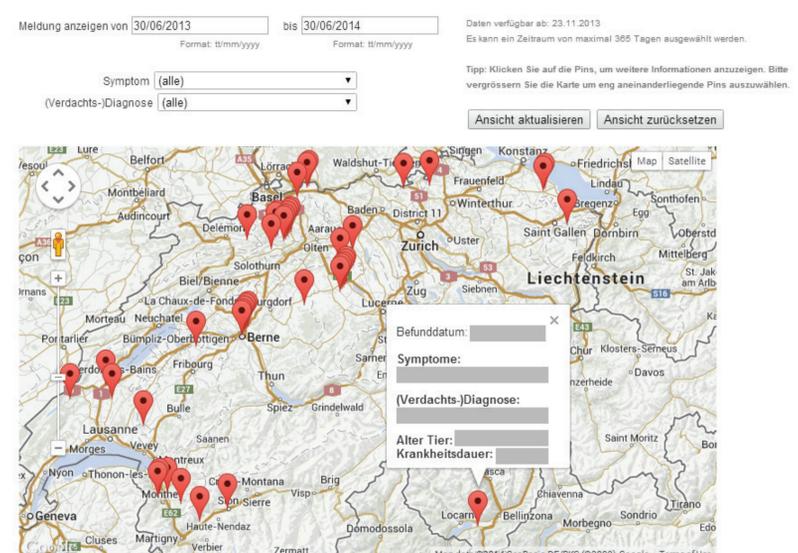


Figure 3: Reporting dashboard for equine syndromic surveillance

Both dashboards were set up in a way that **splits the visualization from the data source**. Underlying changes in the data source therefore instantly affected the visualization. The programming was carried out using Google's Visualisation API and Google Maps JavaScript API, whereby the second visualisation was embedded into the existing syndromic surveillance website www.equinella.ch.