

## Automated Methods to Improve the Completeness of Key Data Elements in Infectious Disease Response

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## Outline

- **Background**
- **Concerns in MAVEN**
- **Concerns: Salmonellosis**
- **Concerns: Babesiosis**
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- **Acknowledgements**



## Background



- In 2013, the Bureau of Infectious Disease began an evaluation of MAVEN, the Massachusetts Virtual Epidemiologic Network (MAVEN), the state's infectious disease surveillance and case management system
- Assessed the completeness of core data elements for disease follow-up
- Town specific results (Key Indicator Reports) were disseminated to all 351 local boards of health



## Background (cont.)



- Results from the evaluation found that certain core data elements were not completed during case investigation
- At the same time, the Office of Integrated Surveillance and Informatics Services (ISIS) was exploring the use of new functionality in MAVEN, "Concerns"



## Concerns in MAVEN

ECHO LAB Age at time of event: 35.37'."/>

- Concerns are color-coded text which are specific to a disease event

## Concerns in MAVEN

- Concerns appear in the main notification section of a disease event
- Highlight critical questions that need to be completed during case follow-up

## Concerns in MAVEN

- Once the questions have been answered, the Concerns disappear from the notification section

## Concerns for Salmonellosis

- For salmonellosis and other enteric diseases, ISIS created the following concern: "Please note the case's occupation in the Demographic Question Package."

ECHO LAB Age at time of event: 35.37'."/>

## Concerns for Babesiosis



- For babesiosis, ISIS created the following concern: "Please note in the Risk/Exposure/Control & Prevention Question Package whether or not the case has received a blood transfusion, tissue products or organ transplant in the past year."

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## Methods



- At the end of 2014, we assessed whether concerns were effective in improving completeness
- Using SAS (9.3), we compared percentages of completeness between 2013 and 2014 using logistic regression
- To determine whether concerns were the main reason behind a possible improvement, we also compared percentages of completeness with other core variables in the key indicator reports that were not highlighted by concerns

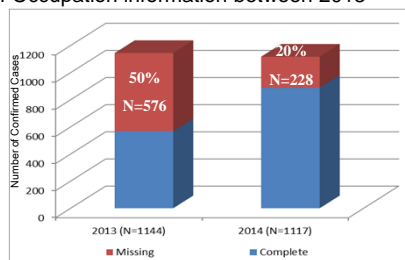
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## Salmonellosis



- Completeness of Occupation information between 2013 and 2014

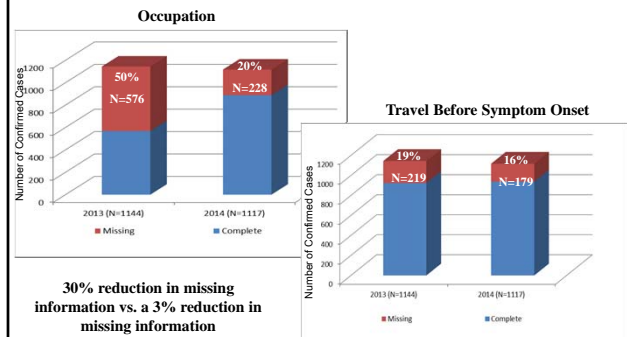
Odds Ratio: 3.95;  
95% Confidence Interval: 3.28, 4.76;  
p-value < 0.0001



Events in 2014 were 4 times more likely to have Occupation completed compared to events in 2013

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## Comparison to other core variables without a concern: salmonellosis



30% reduction in missing information vs. a 3% reduction in complete information

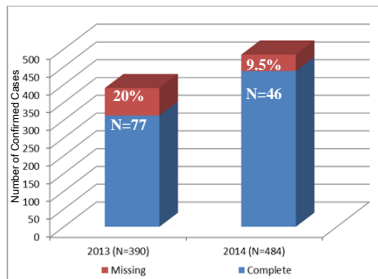
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## Babesiosis



- Completeness of Blood Transfusion, Tissue or Organ Transplant Information between 2013 and 2014

Odds Ratio: 2.34;  
95% Confidence Interval: 1.58, 3.47;  
p-value <0.0001



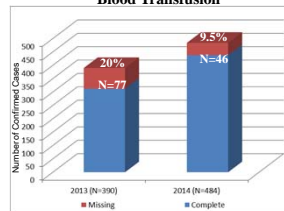
Events in 2014 were 2.3 times more likely to have blood transfusion information completed compared to events in 2013

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## Comparison to other core variables without a concern: babesiosis

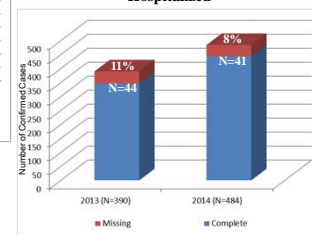


### Blood Transfusion



10.5% reduction in missing information vs. a 3% reduction in missing information

### Hospitalized



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## Conclusions



- Incorporating concerns in MAVEN significantly improved completeness for core variables
- Although we saw some improvement in the other core variables, questions with concerns were more effective in prompting a response

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## Future Steps



- ISIS is now considering other diseases where concerns would be useful
- ISIS plans to continue monitor the completeness of these questions to see if this trend continues

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Thank you  
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