Progress towards an Integrated and Companion Animal Zoonotic Disease Surveillance System within the DoD

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Agenda

- Background and GPAWSS
- GPAWSS-Zonooses
- How are we going to do it?
- Future Initiatives

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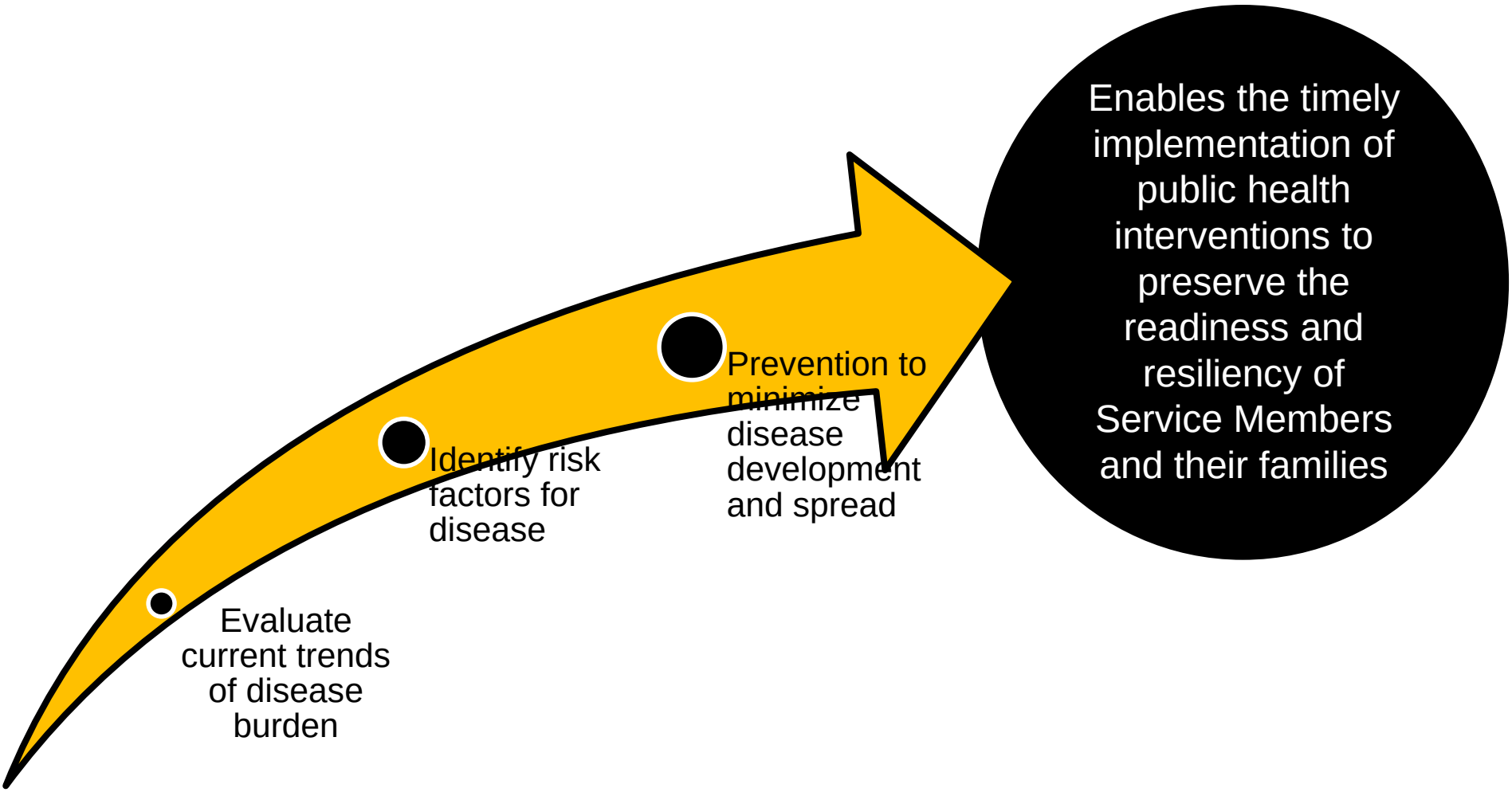
Background and GPAWSS

Why is Disease Surveillance Important?



What Do The Regulations Say?

- The Army is the lead service for veterinary public health and animal health services
  - Responsibility to champion biosurveillance efforts to support One Health initiatives, improving Service Member, family, and veteran health across the Joint Force
  - Army Regulation (AR) 40-905 tasks Veterinary Corp Officers (VCOs) to “conduct disease surveillance programs for DOD-owned and Government-owned (non-DOD) animals”

Animal Disease Surveillance in DoD

Government Owned Animals (GOAs)

Privately Owned Animals (POAs)

Animal Disease Surveillance in DoD

- Centralized disease surveillance in Privately and Government Owned Animals (POAs and GOAs) has been non-existent
  - Prior to the Remote Online Veterinary Record (ROVR): constrained by paper records or private commercial software with no central data-sharing capabilities
  - Knowledge gap of overall burden, distribution, risk factors, and potential impact of diseases

- ROVR gives us the capability to pull data centrally
  - Limitations still exist
  - Need specific guidance to ensure accurate data capture

Government and Privately-owned Animal Worldwide Surveillance System

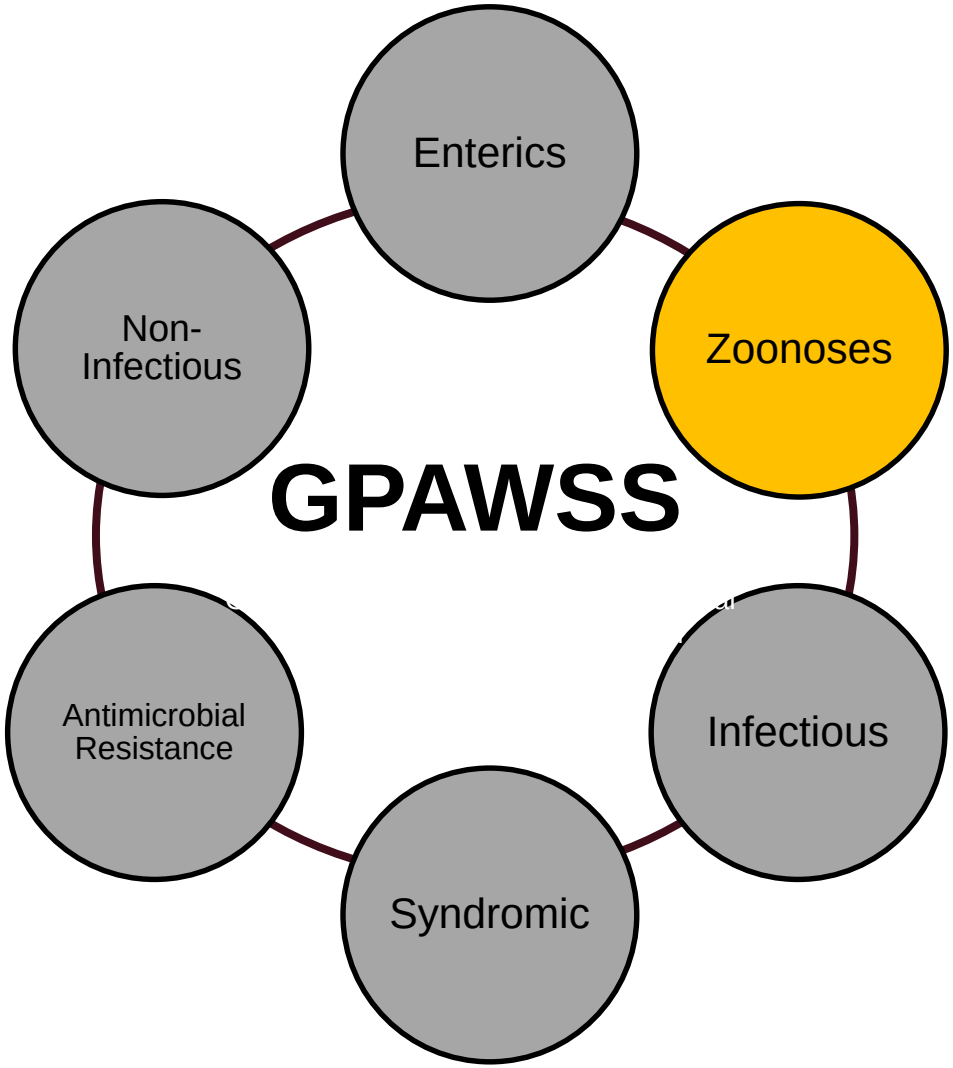
- Surveillance platform designed to inform commanders and VCOs of the distribution, frequency, and incidence of various companion animal diseases
  - Interactive, web-based platform

GPAWSS

- Will utilize multiple data sources
  - ROVR data
  - Laboratory data
  - Data from a civilian corporate companion animal practice

- Managed by VSPHS One Health Division

GPAWSS Programs



GPAWSS-Zoonoses

Why Zoonotic Diseases?

75% of all emerging infectious disease have zoonotic origins

60% of all communicable diseases have zoonotic origins

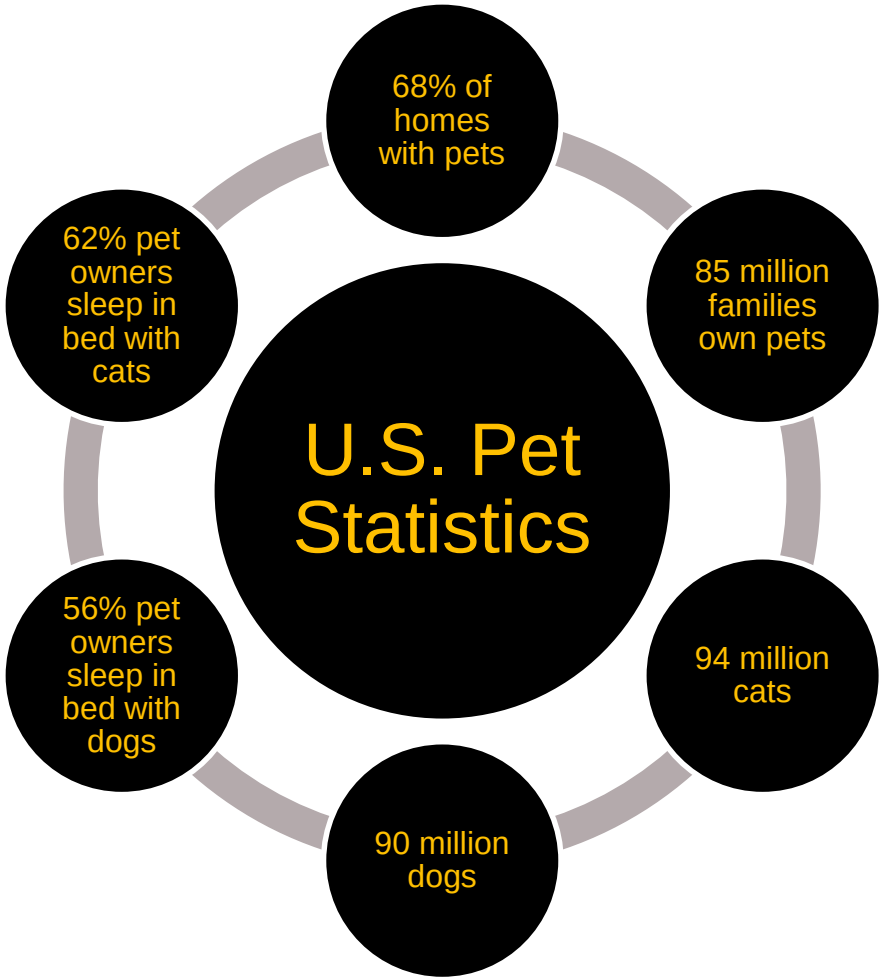
>1 Billion annual cases of human zoonotic diseases

Substantial burden on global health!

Companion Animals and Zoonoses

Factors influencing the occurrence of companion animal zoonoses:

- Growing human population
- Growing pet population
- Shared environments & activities
- Increased urbanization
- Increased global travel and trade
- Microbial adaption and emergence
- Occupational risks

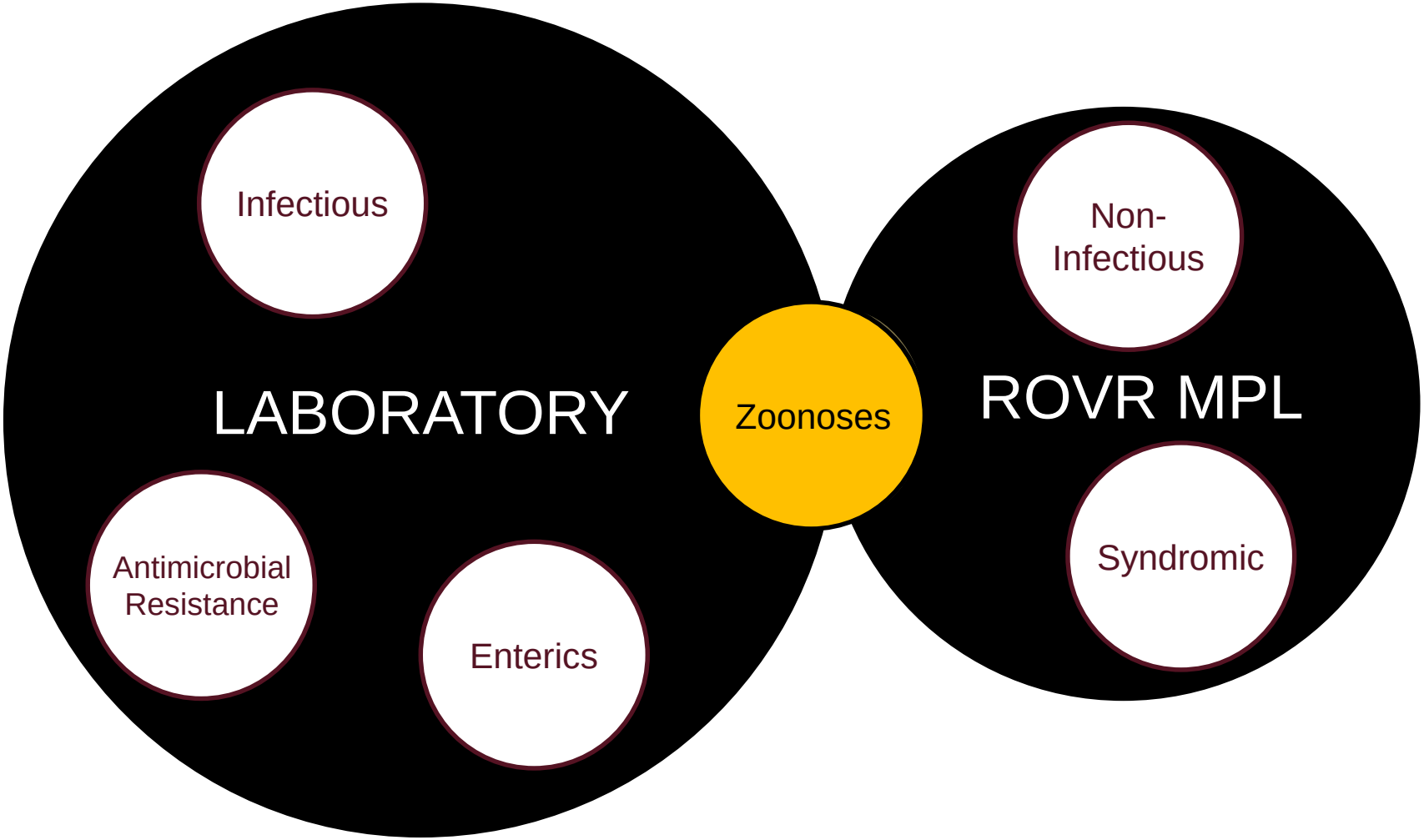


Companion Animals and Zoonoses

- Risk of zoonotic disease transmission increases with persistent contact
  - Especially the immunocompromised
- Human and companion animal interactions have a wide range of benefits to human health
  - Enhancing human physical health
  - Enhancing psychological well-being
- We need to better understand disease burden and useful interventions to minimize risk

How Are We Going To Do It?

GPAWSS Data Sources

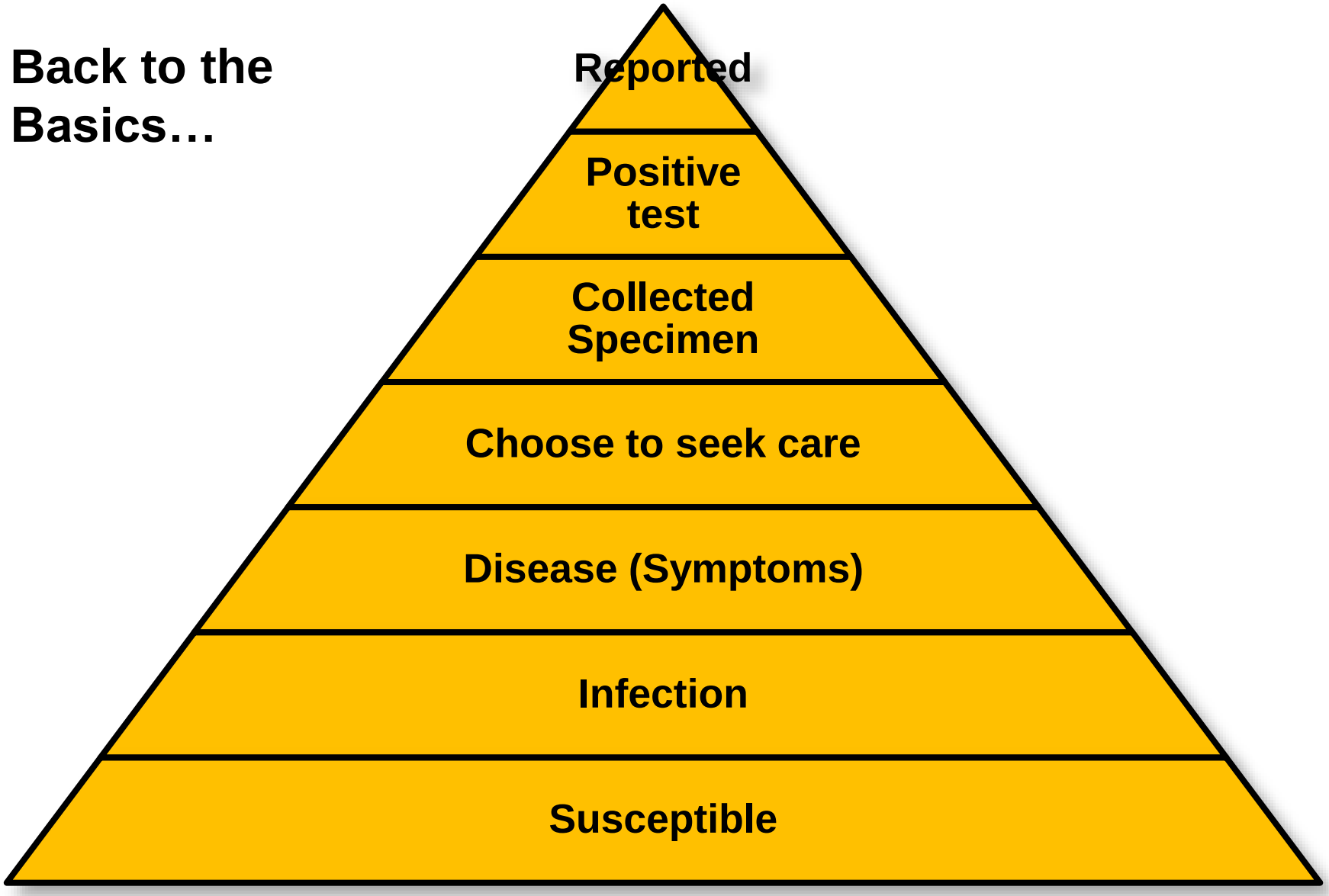


Why the MPL?

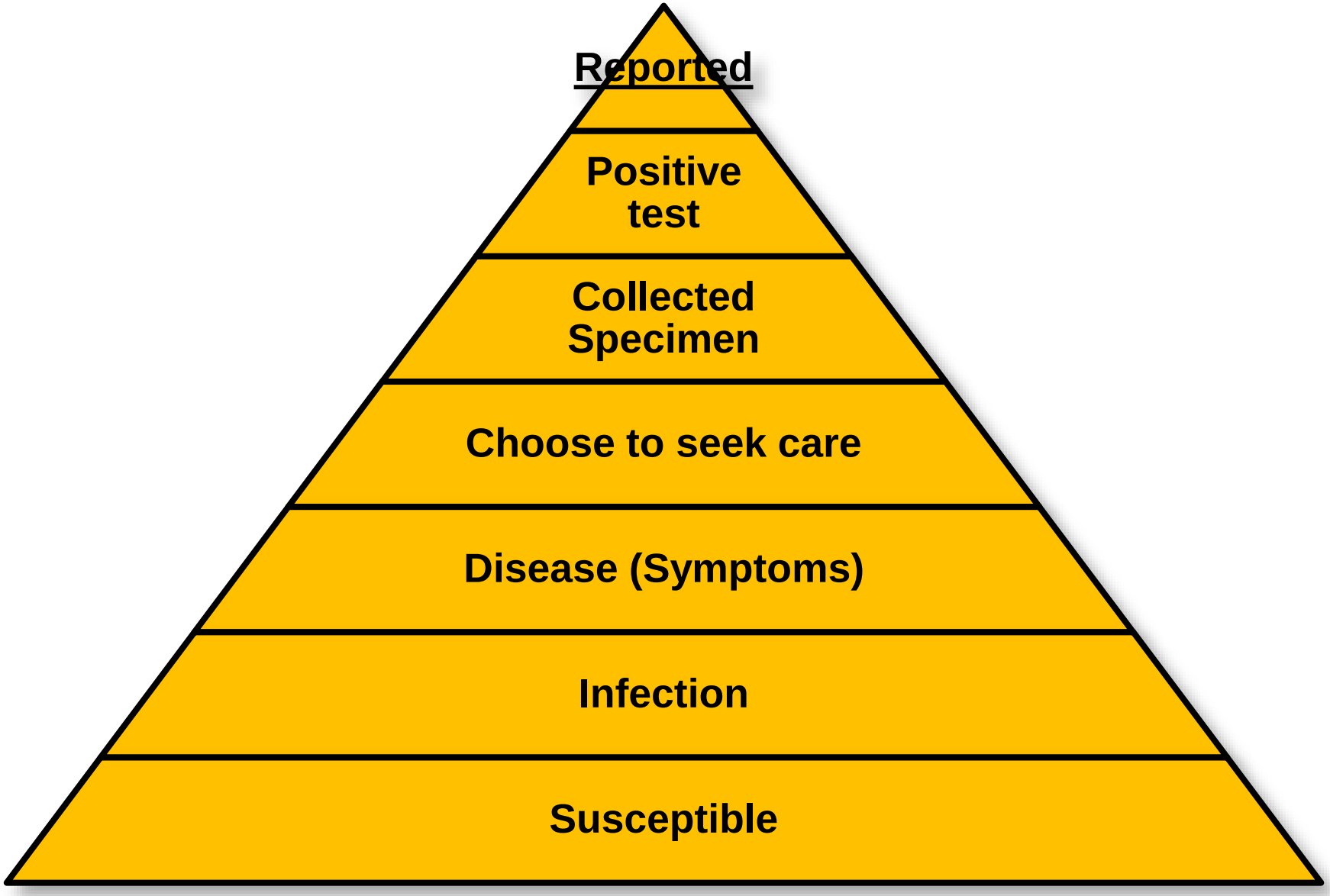
- The master problem list (MPL) is the only data point in ROVR that can be:
  - Input by VTF personnel via a non-free text entry
    - Systematic data entry
  - Exported via an existing central report that is NOT a registry report (i.e., will not crash ROVR accidentally)
  - Easily accessed by a central reporting element

Infectious Disease Surveillance Pyramid

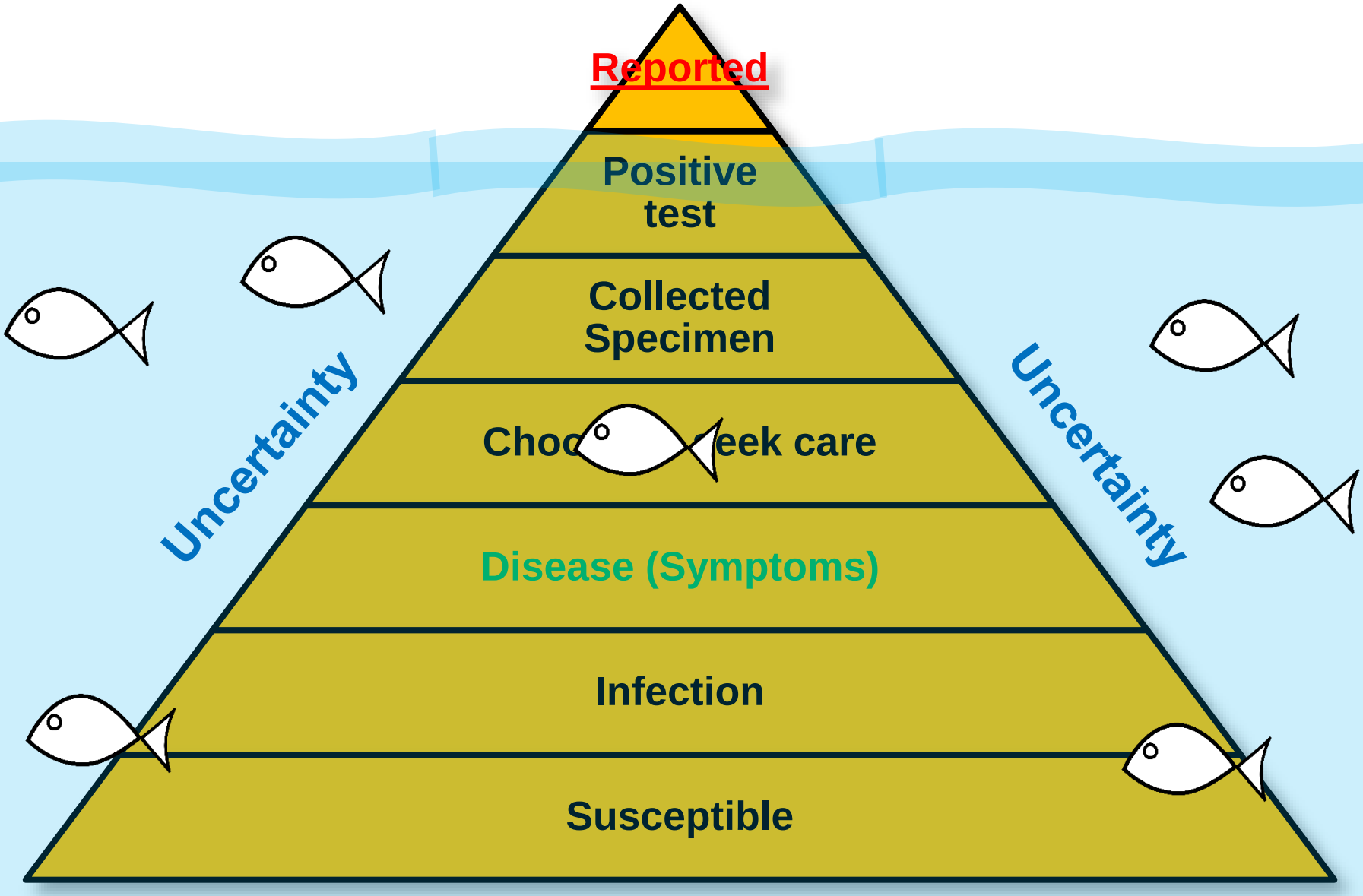
Back to the Basics…



Infectious Disease Surveillance Pyramid



Infectious Disease Surveillance Pyramid



Infectious Disease Surveillance Pyramid

#DRAINTHEOCEAN

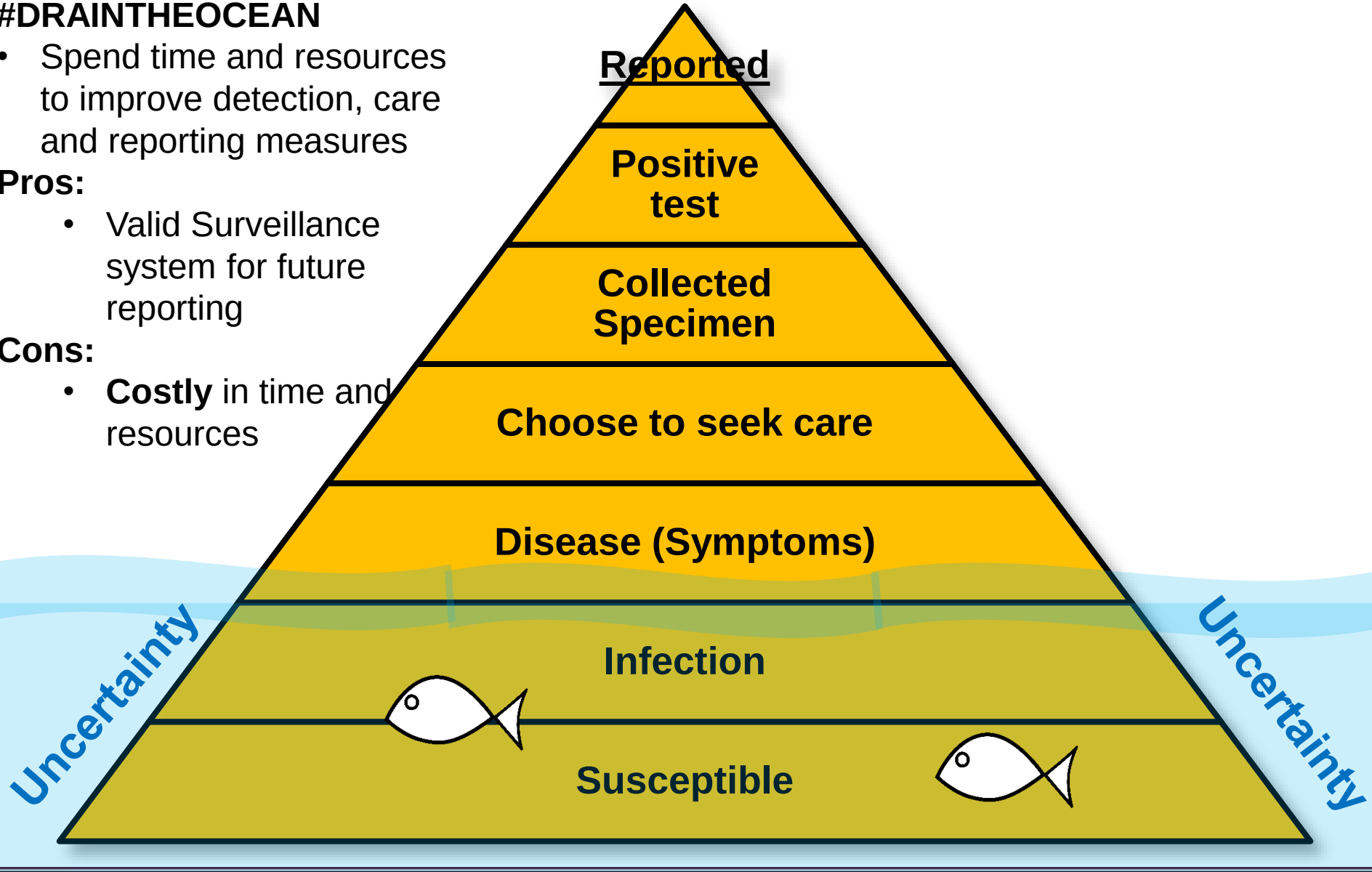
- Spend time and resources to improve detection, care and reporting measures

Pros:

- Valid Surveillance system for future reporting

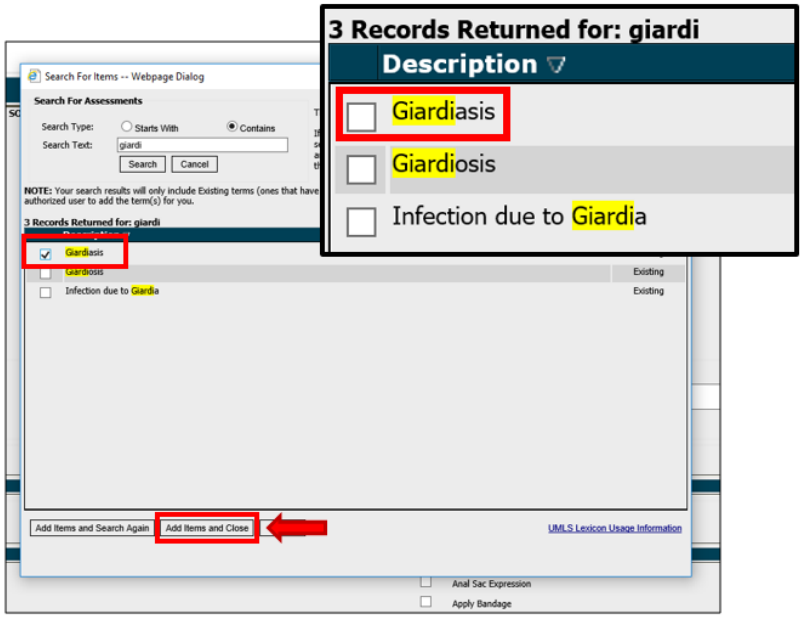
Cons:

- **Costly** in time and resources



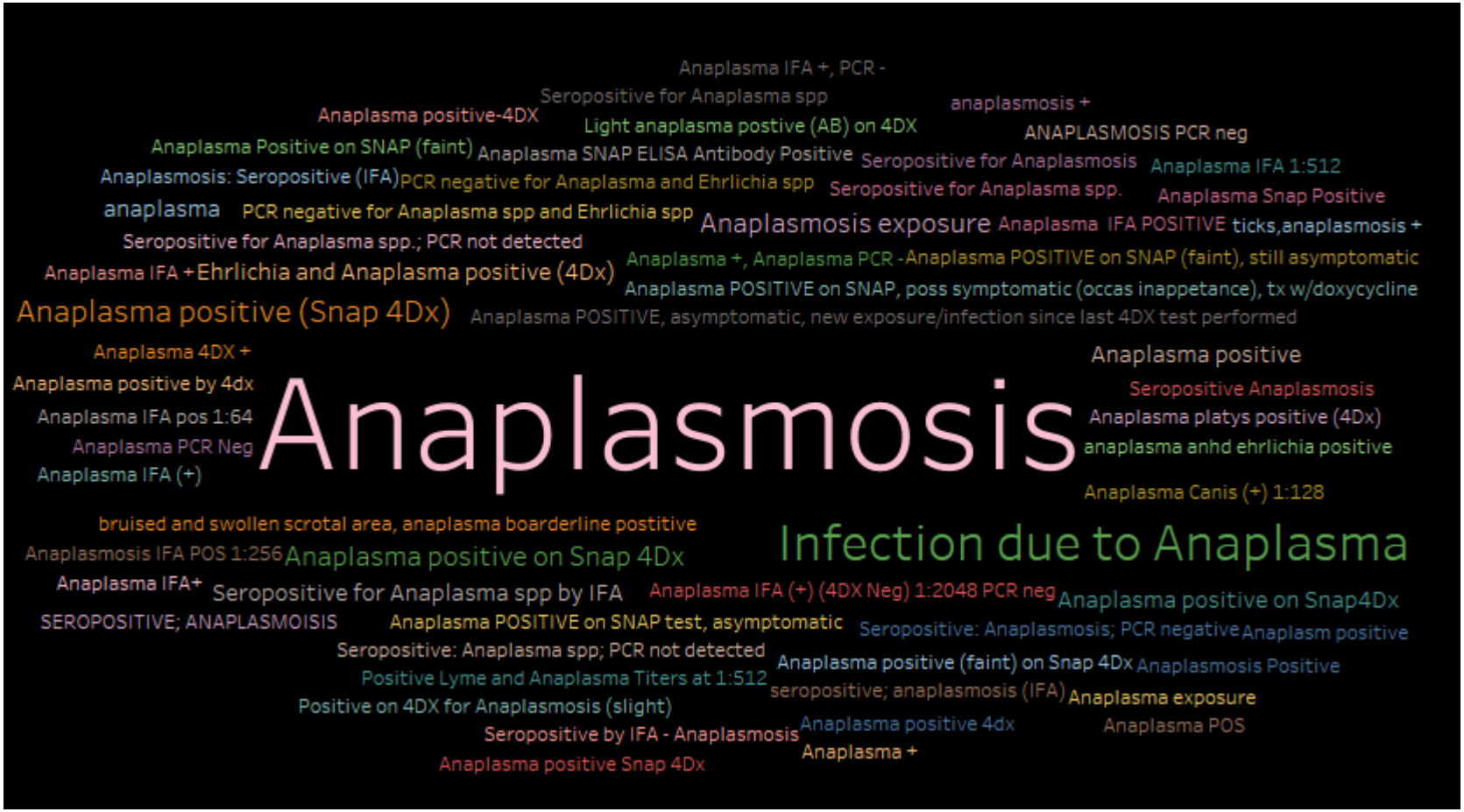
Importance of Using MPL Search

Using the MPL search function and selecting the exact search term outlined in the GPAWSS-Zoonoses Reporting Guide will make data capture systematic, reducing errors and requirement for scrubbing

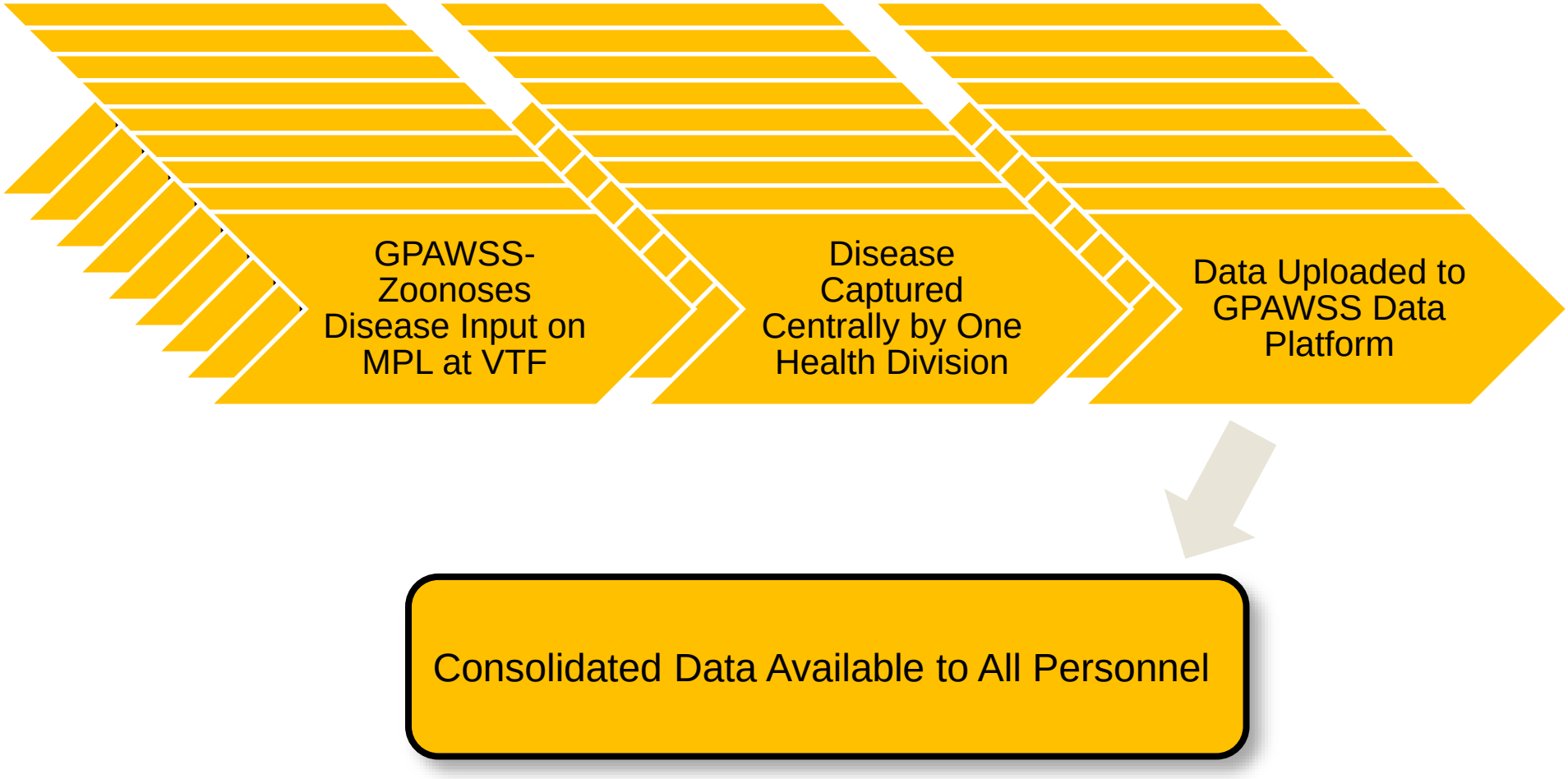


Importance of Using MPL Search

64 different MPL entries for Anaplasmosis alone!



GPAWSS-Zoonoses Approach

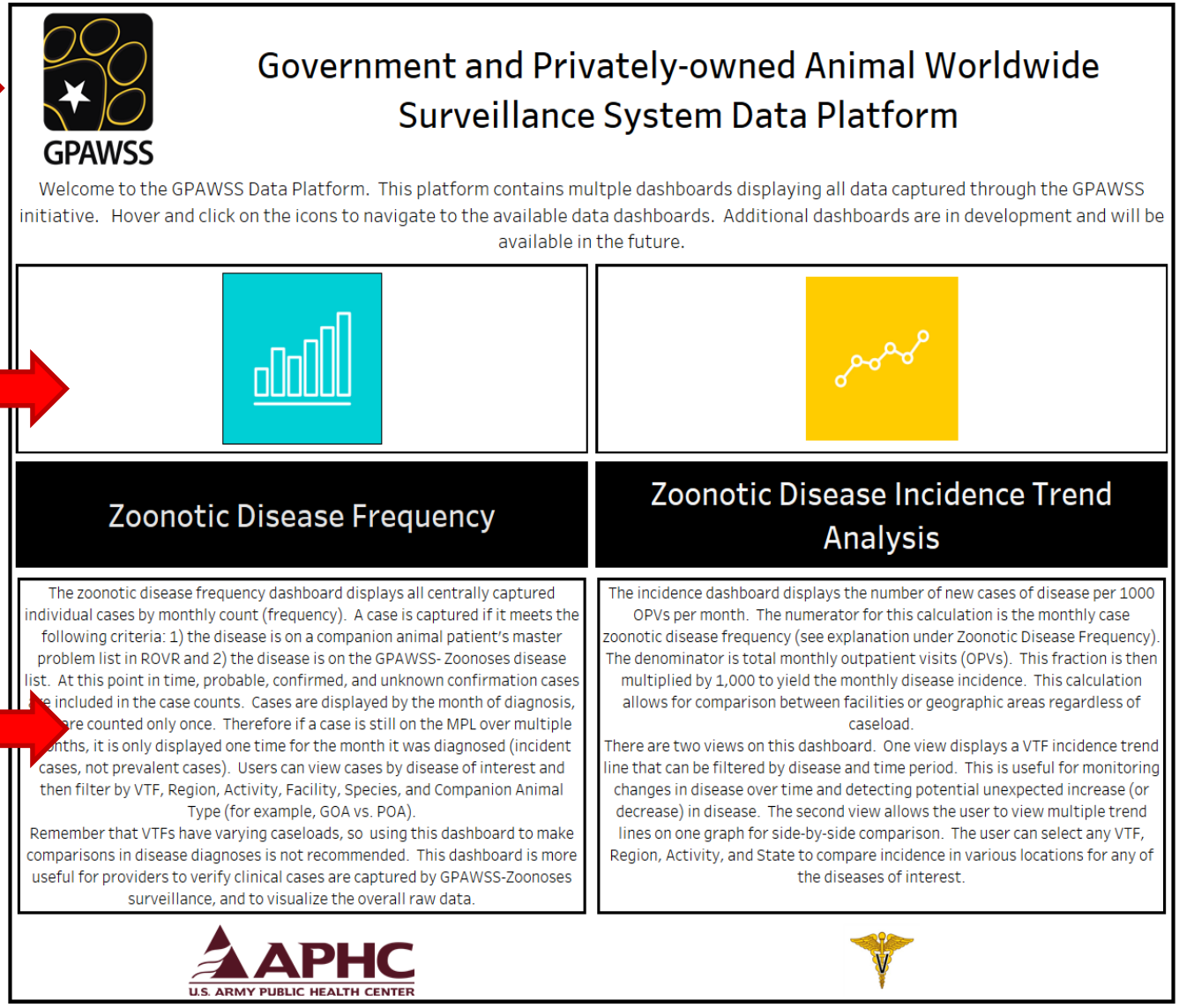


GPAWSS Data Platform

Link to GPAWSS website

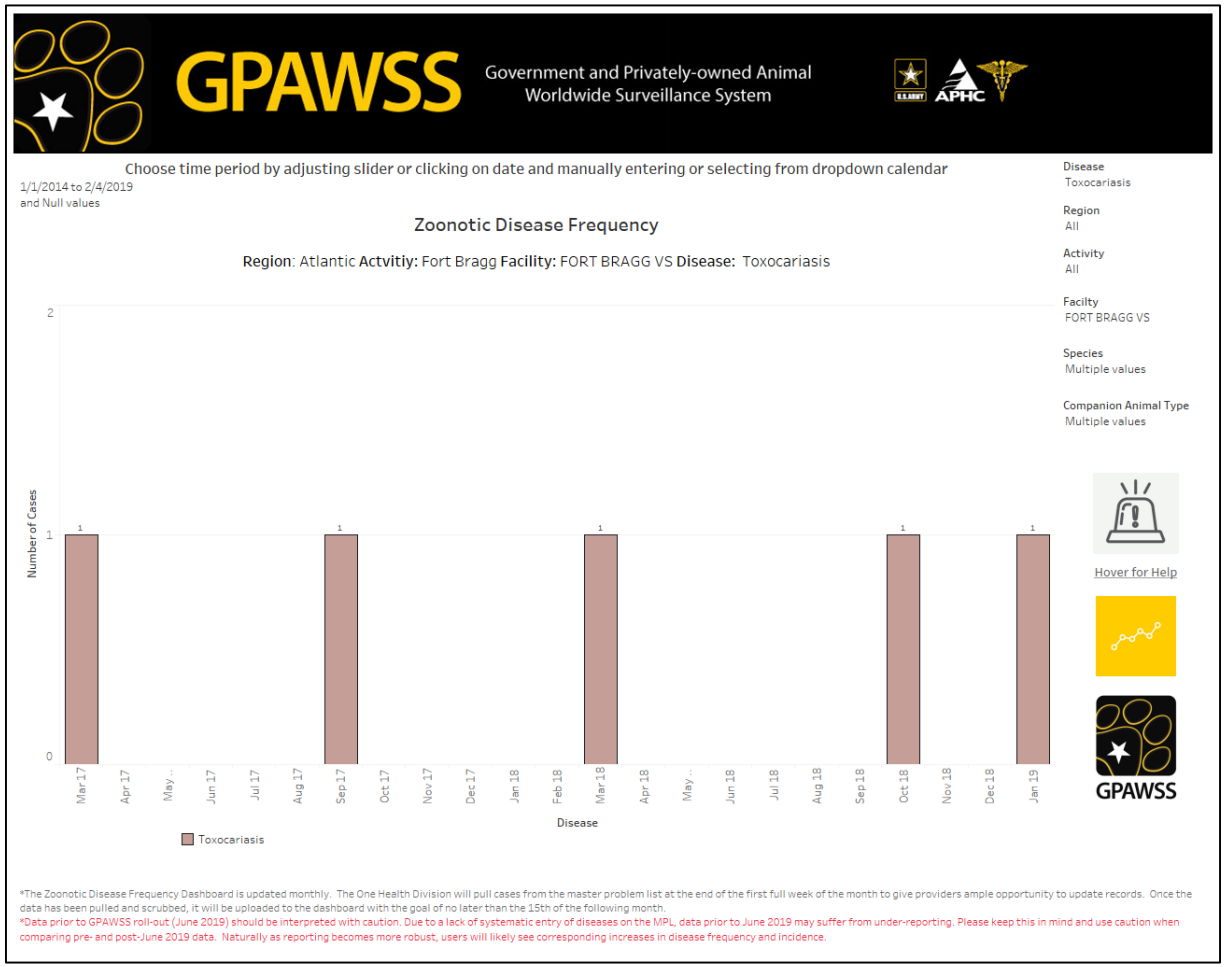
Navigation icons link to the two dashboards

Dashboard Descriptions



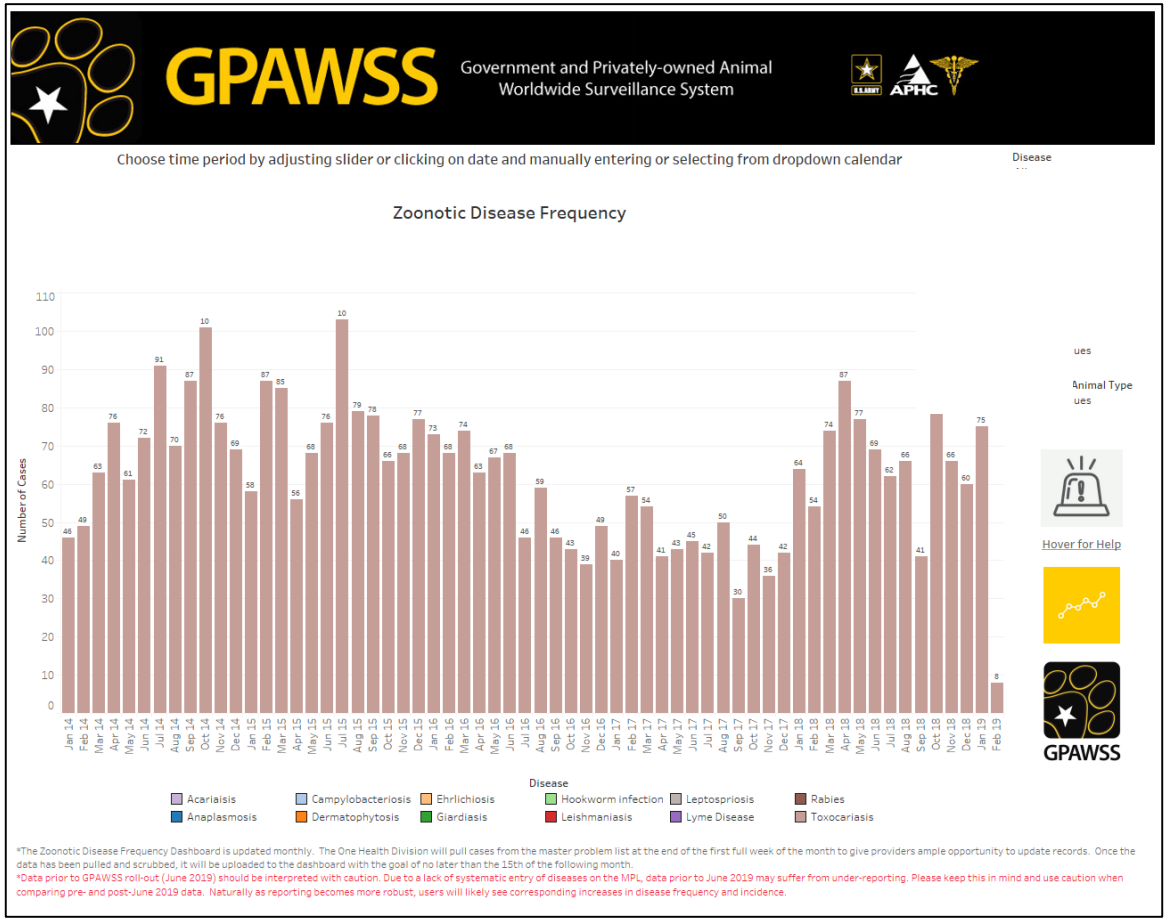
GPAWSS-Zoonoses Approach

Data capture with no systematic data entry…

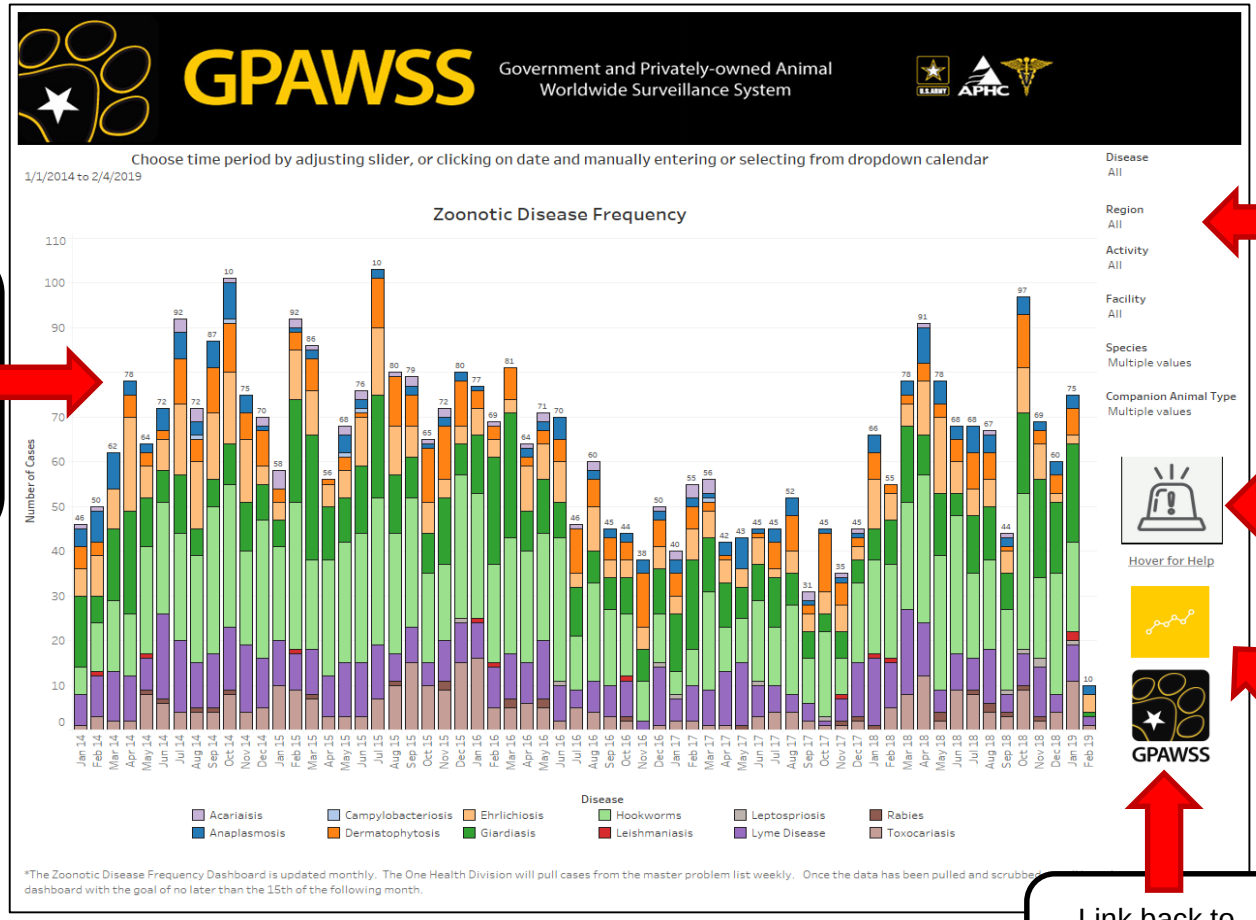


GPAWSS-Zoonoses Approach

What data could start to look like with systematic entry!



GPAWSS Data Platform



Hover over bars to display additional information

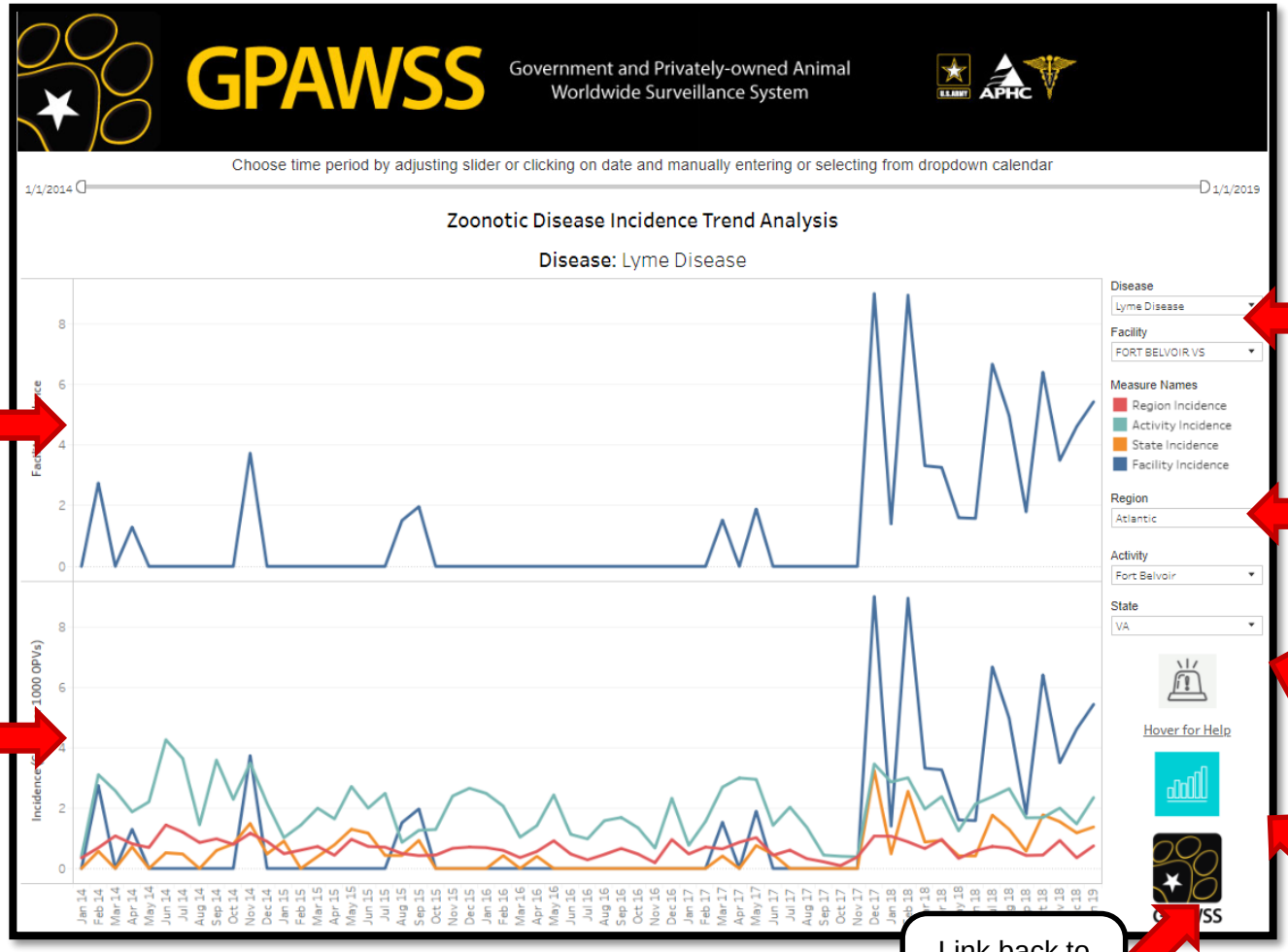
Filters: Disease, Region, Activity, Filter, Species, & Companion Animal Type

Hover pointer over “alarm” for help tips

Link to Incidence Trend Analysis Dashboard

Link back to Navigation Page

GPAWSS Data Platform



Individual VTF Incidence

VTF, State, Region, & Activity Incidence

Filters: Disease, Facility

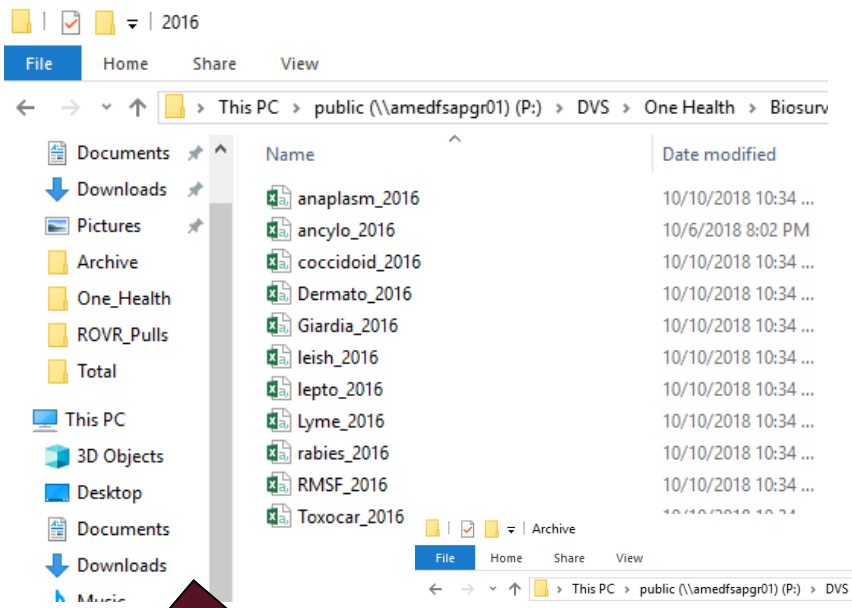
Filters: Region, Activity, State

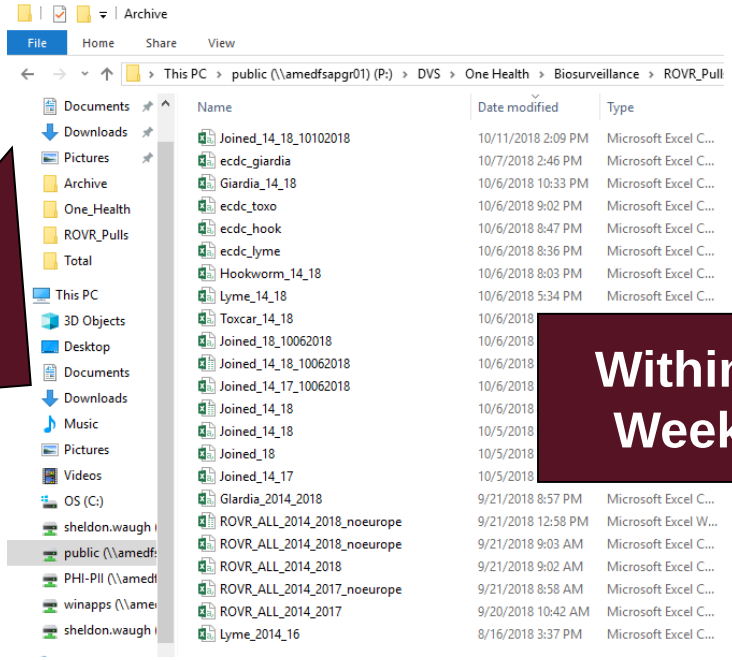
Hover pointer over "alarm" for help tips

Link to Incidence Trend Analysis Dashboard

Link back to Navigation Page

Database Creation and Storage





Within 1 Week

Within 2 Weeks

BLUF…or in the middle

Systematic entry of diseases on the MPL minimizes under-reporting and enhances the GPAWSS Data Platform

Future Initiatives

Future Initiatives

- Implementation of other GPAWSS Programs
- Laboratory surveillance
  - No additional work by VTF personnel
  - Capture laboratory test results automatically
  - Low human error

Future Data Uses

- Overlay with AFHSB human data
- Overlay with human and animal tick data
- Data integration along with robust data structures could allow for the development of methodologies investigating the potential of companion animals serving as sentinels for disease
- Identify possible emergence of diseases

Future Reporting Tools

Outbreak detection module (R and R-Shiny)

ROVR Zoonotic Disease Surveillance (Outbreak Detection)

Observing possible alarms stratified by Region, Activity, VTF, and Disease

Algorithms | EARSC | Farrington Flexible | Dataset

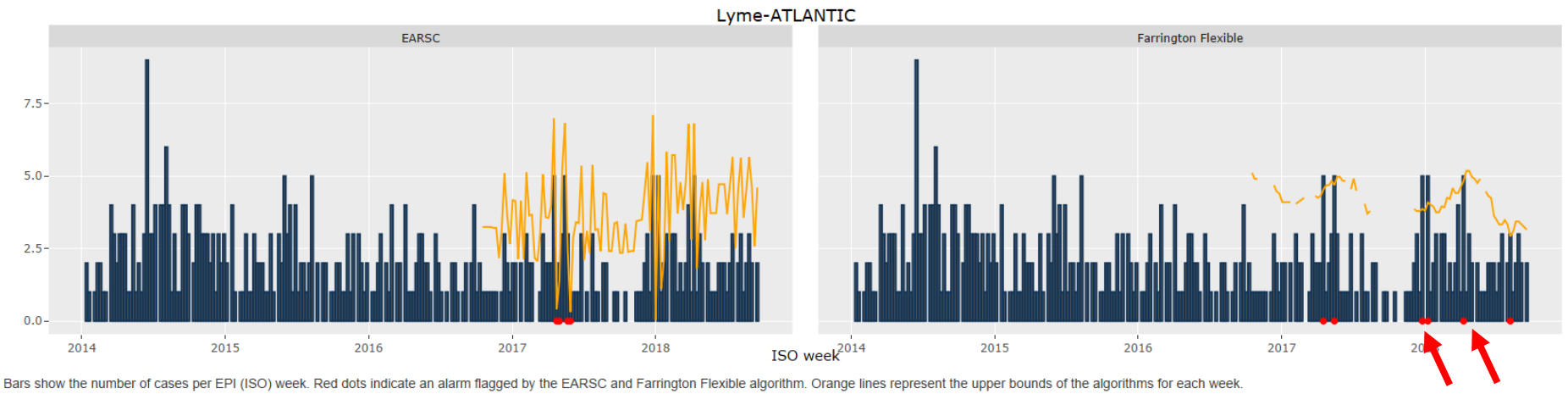
Select algorithms

EARSC Farrington Flexible

Monitor last X weeks:

100

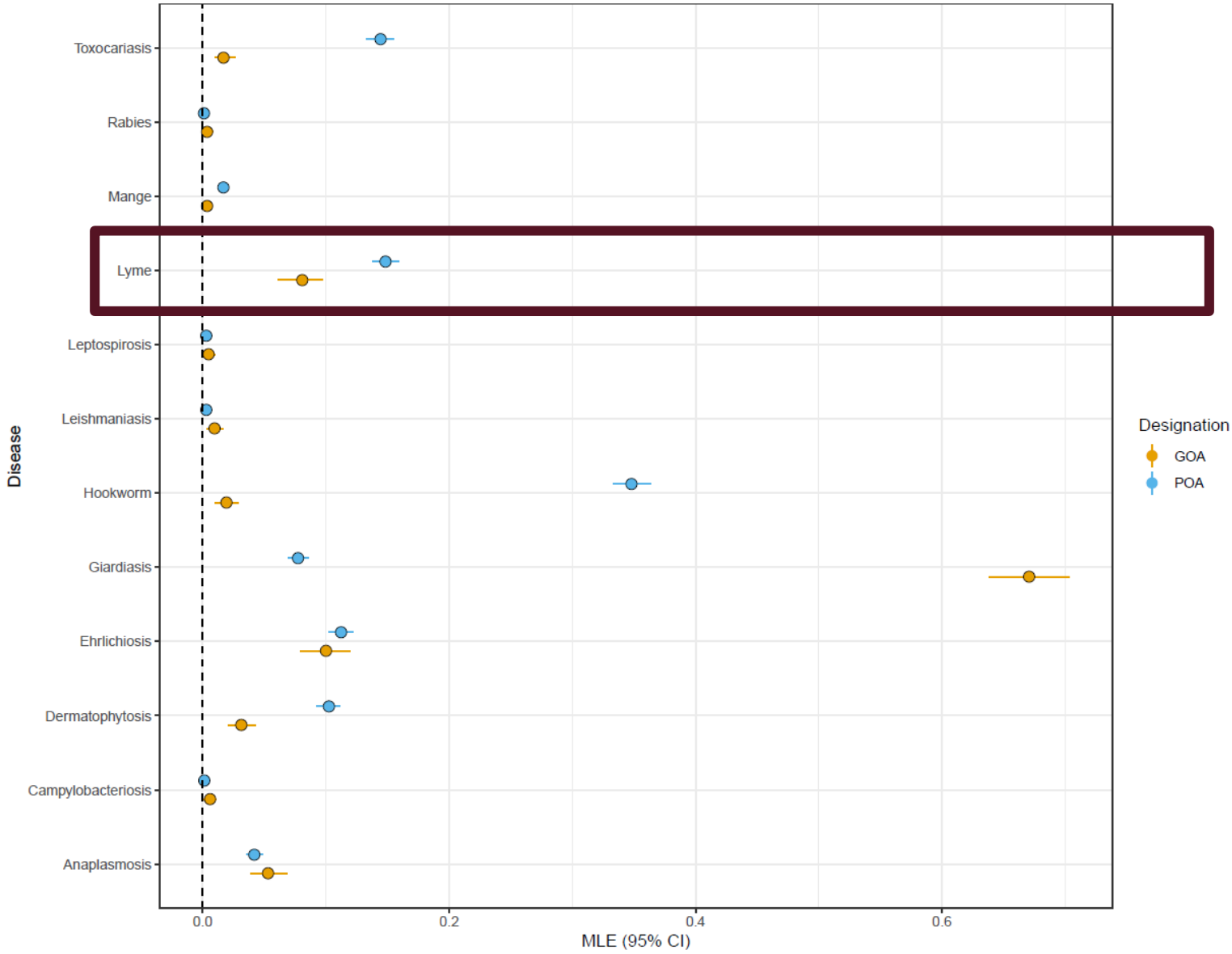
Update charts



Bars show the number of cases per EPI (ISO) week. Red dots indicate an alarm flagged by the EARSC and Farrington Flexible algorithm. Orange lines represent the upper bounds of the algorithms for each week.

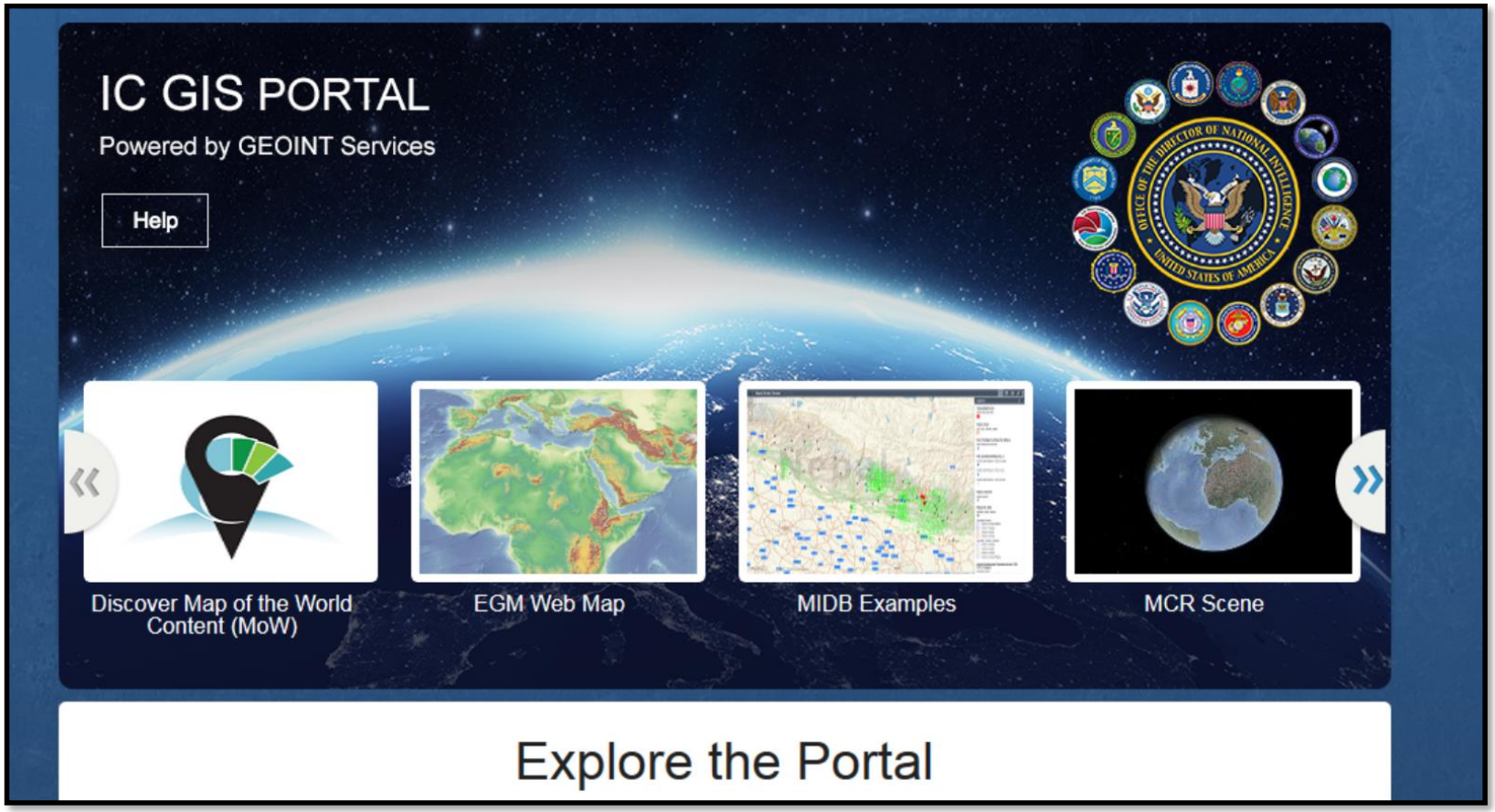
Potential Alarms

Maximum Likelihood Comparisons



Future Reporting Tools

GIS Mapping through National Geospatial Intelligence Agency



Questions??