Going beyond traditional surveillance for *Cryptosporidium* in Oregon

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Oregon // Multnomah County

- One of 36 counties in Oregon
- Population: ~800,000
- State's most populous county

Oregon // Bull Run Watershed

- Primary drinking water supply for the City of Portland and its 20 wholesale customers.
- Water from the Bull Run serves more than 970,000 residents in the Portland metropolitan region.
- 19 wholesale water districts
- 101 million gallons per day
- 102-square-mile protected Watershed
- Variance to the EPA regulations for Cryptosporidium treatment until December 2017
  - Detection of oocysts

OREGON HEALTH AUTHORITY
PUBLIC HEALTH DIVISION
OFFICE OF ENVIRONMENTAL PUBLIC HEALTH
DRINKING WATER PROGRAM

In the Matter of: Portland Water Bureau's Request for Variance under 42 USC § 300g-4(a)(1)(B)	**Final Order**

I. INTRODUCTION

Statutory and Regulatory Background

1. EPA drinking water regulations reflect a multiple barrier approach to assure that public water systems reliably supply safe drinking water for consumers. Examples of such barriers include: protection of source water; treatment of source water; and properly trained and certified water system operators.[1]

2. In 2006, the US Environmental Protection Agency (EPA) finalized its Long-Term 2 Enhanced Surface Water Treatment Rule (LT2).[2] Among other provisions, this regulation contains a treatment technique standard that requires unfiltered water systems subject to federal regulation that have no current treatment for *Cryptosporidium* to: 1) treat its source water for *Cryptosporidium*; and 2) use at least two disinfectants.[3]

3. The Safe Drinking Water Act (SDWA), Section 1415(a)(1)(B), (42 USC § 300g-4(a)(1)(B)), permits a State that has primary enforcement responsibility to grant a variance from a specified treatment technique *if the water system "demonstrates to the satisfaction of the State that such treatment technique is not necessary to protect the health of persons because of the nature of the raw water source of such system."*[4] (Emphasis added)

Variance Conditions

Intake Monitoring:

- Observation Monitoring
  - Two 50-liter samples per week
  - Daily samples if turbidity >2.0 NTU
- If Crypto is detected, then Demonstration Monitoring
  - Notifications, Press release
  - Increased Monitoring For 1 year
    - 250 L per week
    - Variance revoked if >0.075 oocysts / 1000 L

Watershed Protection:

- Maintain Protections
- Monitor Trespass
- Contain Human Waste
- Annual Watershed Report:
  - Sampling:
    - Tributary Monitoring
    - Scat Monitoring
  - Inspections:
    - Security, Diversion Pool Fence, Wildlife, Landslides, Sanitary Facilities

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Oregon Health Authority

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Nick Fish, Commissioner
Michael Stuhr, P.E., Administrator

1120 SW 5th Avenue, Room 600
Portland, Oregon 97204-1926
Information: 503-823-7404
www.portlandoregon.gov/water

News Release

For Immediate Release
January 30, 2017

Contact: Jaymee Cuti, Portland Water Bureau
(503) 823-8064
jaymee.cuti@portlandoregon.gov

Water Bureau Finds Additional *Cryptosporidium* in Bull Run Water

City to continue increased monitoring efforts of drinking water source

Today, the Portland Water Bureau received results that *Cryptosporidium,* a potentially pathogenic microorganism, was detected in a water sample collected Wednesday, January 25, from the Bull Run watershed, which provides drinking water to Portland and neighboring communities. The lab results show that one individual *Cryptosporidium* oocyst was present in a 50-liter (~13 gallons) sample of water.

At this time, we do not believe there is any increased public health risk as a result of the current detection. The general public is not being asked to take any special precautions. We continue to recommend that people with severely weakened immune systems seek specific advice about drinking water from their health care provider.

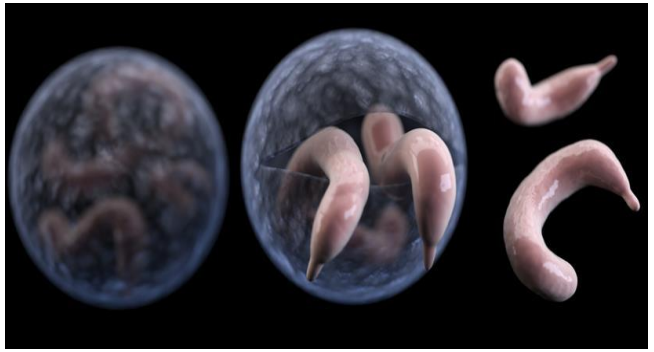
The Portland Water Bureau currently does not treat for the parasite *Cryptosporidium* because of a variance issued by the State of Oregon Health Authority (OHA) in 2012. Instead, the Portland Water Bureau is required to conduct routine monitoring for *Cryptosporidium* and notify the public of any detections.

This detection at the intake is the third detection this month. January 2nd was the first detection since the Portland Water Bureau began operation under the variance in April 2012. Prior to that, the last time *Cryptosporidium* was detected was December, 2011, when a single oocyst was also detected.

As required by the conditions of the variance, the Portland Water Bureau had been testing for *Cryptosporidium* at the source water intake twice a week. Since January 8th, the Portland Water Bureau began monitoring at the source water intake at least four times per week for one year to demonstrate whether the *Cryptosporidium* concentration in the source water is less than 0.075 oocysts per 1,000 liters.

Oregon Health Authority

Cryptosporidium // The Agent



- Parasitic infection of both humans and animals
  - Forms oocysts – tolerant to chlorine disinfection and increases survival time.
- Leading cause of waterborne illness (drinking and recreational)
- Symptoms include watery diarrhea, abdominal pain/cramps, nausea, vomiting, fever, weight loss lasting 1-2 weeks in healthy persons
  - Intermittent illness – recommend three separate stool specimens on different days to rule out infection
  - Illness begins 2-10 days after exposure (average 7)
  - Some people are asymptomatic

hominis

parvum

Genotypes found in Bull Run Wildlife Scat 2013-2018

Species/Genotype	Bull Run Host(s)	Total #	# in WY 2017
PNW17a	Deer mouse (15), Bobcat (1), Deer (1)	17	14
PNW17b	Deer mouse (7), Coyote (2), Bobcat (1)	10	8
Novel (no match 99.5% or better)	Bobcat (3), Deer (1), Deer Mouse (3), Skunk (1)	8	1
Generic (not classified)	Deer (3), Bobcat (2), Coyote (1), Deer mouse (1)	7	2
Deer genotype	Deer	3	1
C. parvum	Deer Mouse, Deer, Elk	3	0
PNW17c	Bobcat, Coyote, Deer mouse	3	3
PNW15a	Mountain beaver	3	0
C. canis	Cougar or Coyote	2	0
Bear genotype	Bear	2	2
C. andersoni	Bobcat	2	1
C. ubiquitum	Mt. Beaver, Bobcat	2	0
PNW17d	Deer mouse	2	2
C. felis	Bobcat	1	0
Skunk genotype	Snowshoe Hare	1	0

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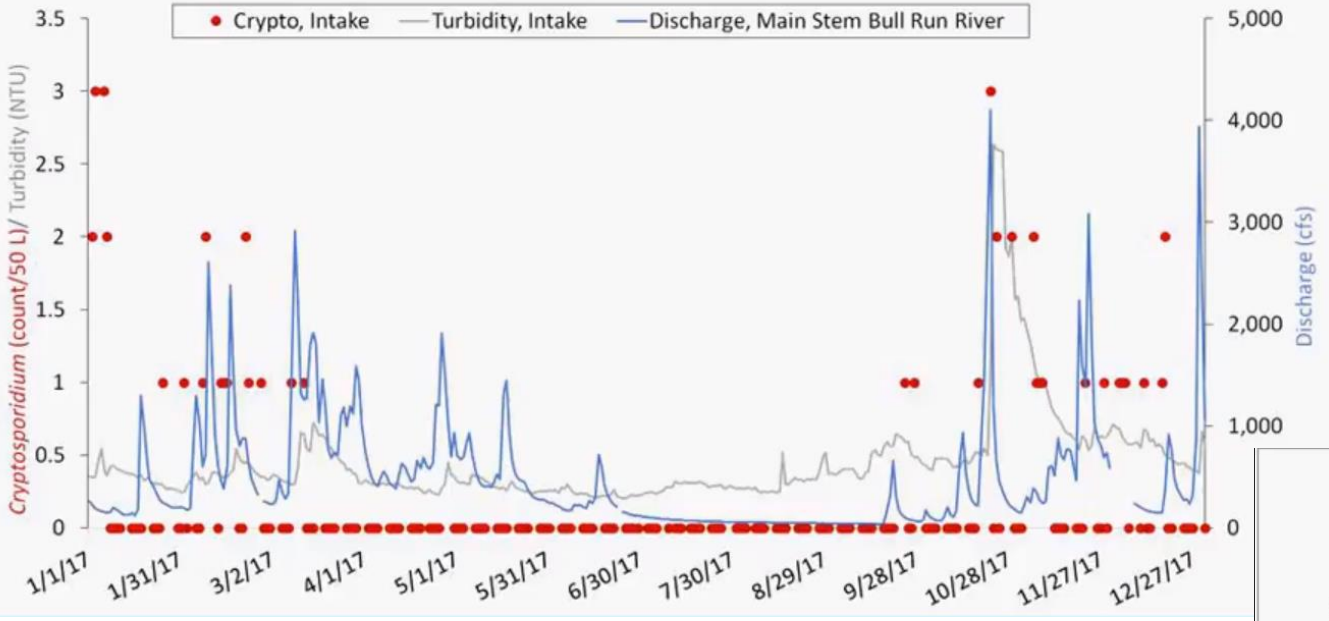
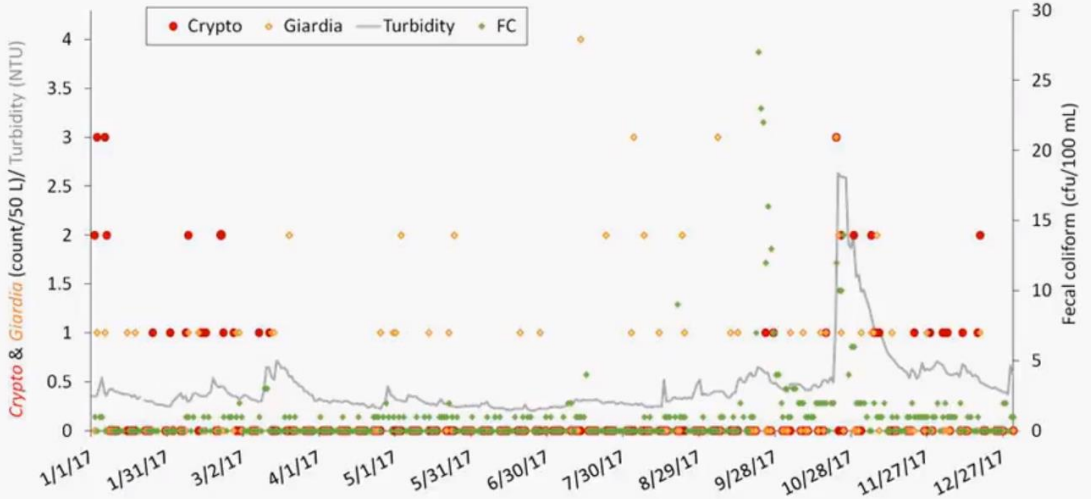
Cryptosporidium, Turbidity and Main Stem Flow, 2017



Cryptosporidium, Giardia, Fecal Coliform, and Turbidity, 2017



PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Oregon Health Authority

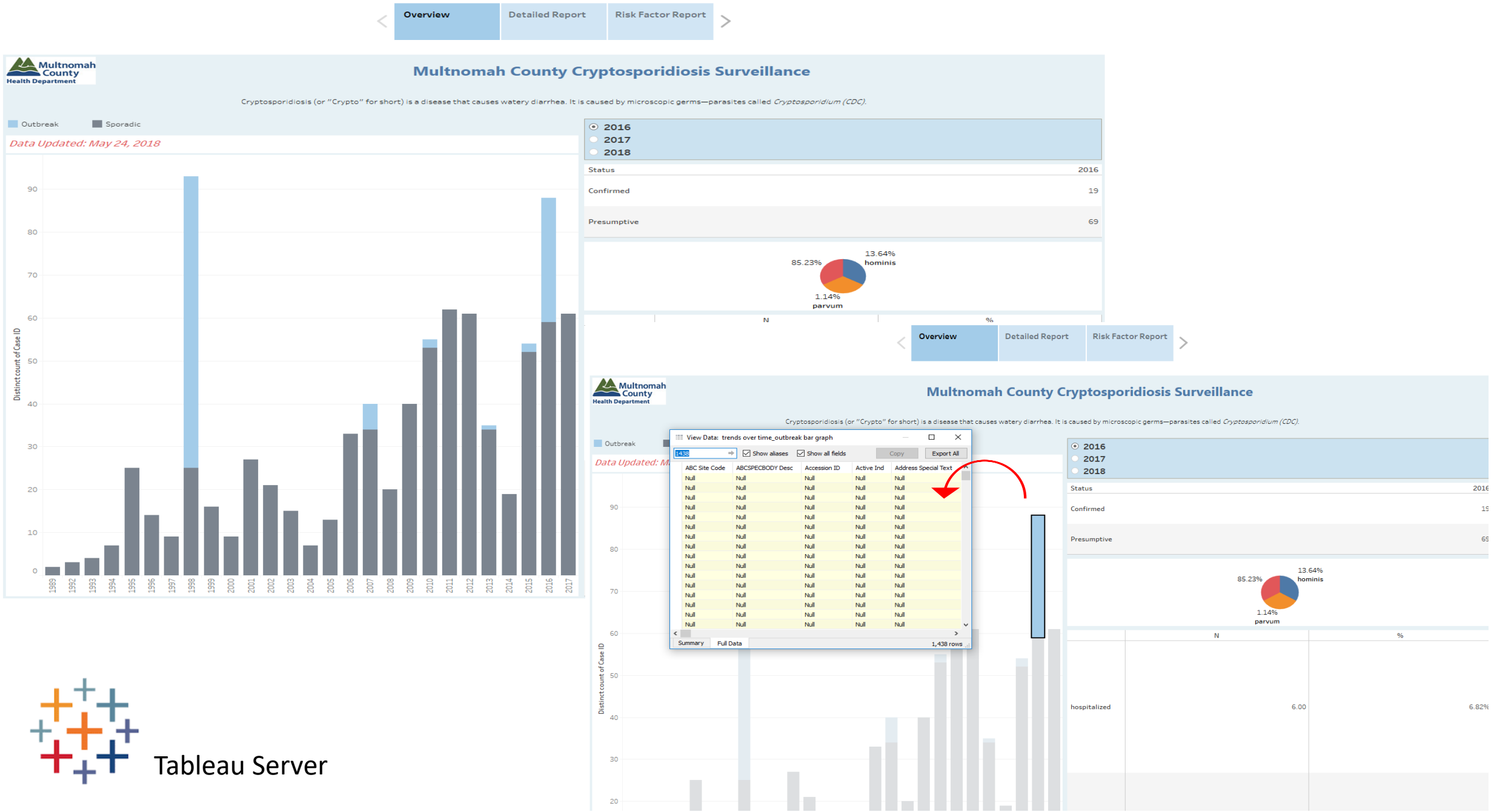


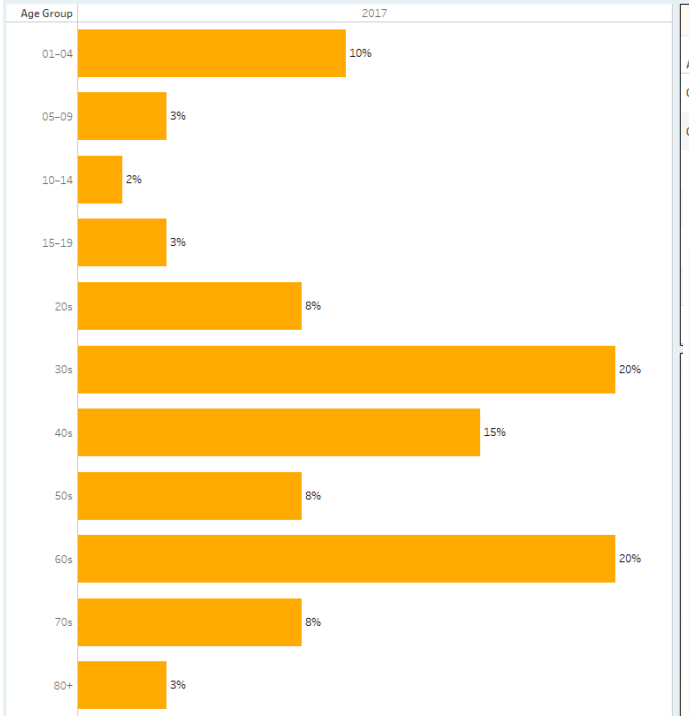
Tableau Server

Overview | Detailed Report | Risk Factor Report

Multnomah County Health Department

Multnomah County Cryptosporidiosis Surveillance Report

2018
2017
2016



Crypto Cases by Age Group and Gender

Age Group	N F	N M	% F	% M	N Total	% Total
01–04	3	3	5%	5%	6	10%
05–09	2		3%		2	3%

Overview | Detailed Report | Risk Factor Report

Multnomah County Health Department

Multnomah County Cryptosporidiosis Surveillance Risk Factor Report

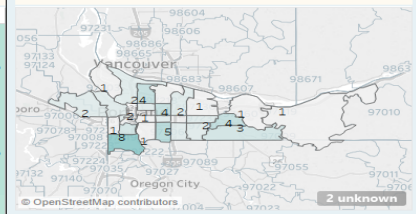
(All)
Clinical
Followup
Risk

2016
2017
2018

Review of Questions

	Yes	No	Unknown	Null
CAnorexia	44.26%	47.54%	3.28%	4.92%
CCramps	67.21%	27.87%		4.92%
CDiarrhea	86.89%	9.84%		3.28%
CFever	18.03%	73.77%	4.92%	3.28%
CNausea	57.38%	37.70%		4.92%
CVomiting	22.95%	73.77%		3.28%
CWeightloss	37.70%	52.46%	4.92%	4.92%

Map of cases by zip



Immunocompromised Cases

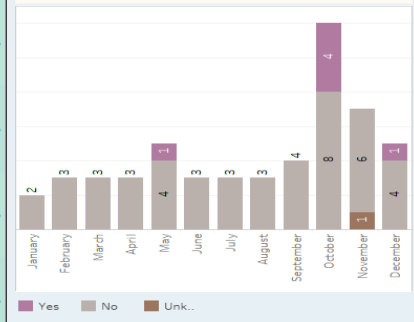
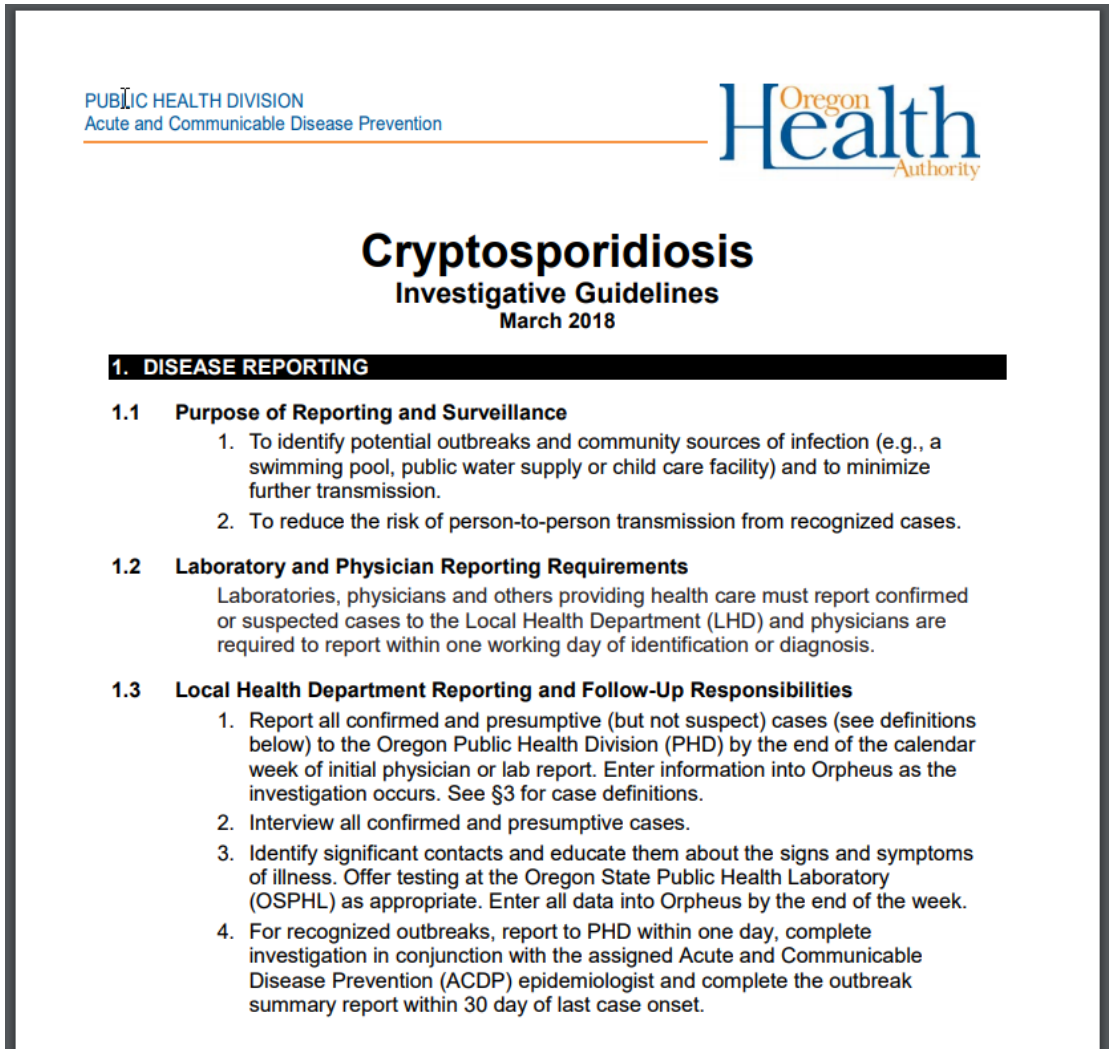


Tableau Server

Cryptosporidium Investigative Guidelines

Attribute	Description
Datastream	Electronic Lab Reports (ELR)
Access	State and local Public Health
Timeliness	Immediate, 24 hours, 1 working day, or 7 day reporting, per Oregon disease reporting requirements
Analysis Method	Cases assigned for manual review; new cases created from ELR show up on home page
Review Frequency	Immediate upon receipt of reports, weekly, and monthly
Case Definitions	Oregon list of reportable diseases/conditions
Case Details	Complete demographic, symptom, and exposure data



PUBLIC HEALTH DIVISION
Acute and Communicable Disease Prevention

Oregon Health Authority

Cryptosporidiosis
Investigative Guidelines
March 2018

1. DISEASE REPORTING

1.1 Purpose of Reporting and Surveillance

1. To identify potential outbreaks and community sources of infection (e.g., a swimming pool, public water supply or child care facility) and to minimize further transmission.
2. To reduce the risk of person-to-person transmission from recognized cases.

1.2 Laboratory and Physician Reporting Requirements

Laboratories, physicians and others providing health care must report confirmed or suspected cases to the Local Health Department (LHD) and physicians are required to report within one working day of identification or diagnosis.

1.3 Local Health Department Reporting and Follow-Up Responsibilities

1. Report all confirmed and presumptive (but not suspect) cases (see definitions below) to the Oregon Public Health Division (PHD) by the end of the calendar week of initial physician or lab report. Enter information into Orpheus as the investigation occurs. See §3 for case definitions.
2. Interview all confirmed and presumptive cases.
3. Identify significant contacts and educate them about the signs and symptoms of illness. Offer testing at the Oregon State Public Health Laboratory (OSPHL) as appropriate. Enter all data into Orpheus by the end of the week.
4. For recognized outbreaks, report to PHD within one day, complete investigation in conjunction with the assigned Acute and Communicable Disease Prevention (ACDP) epidemiologist and complete the outbreak summary report within 30 day of last case onset.

Interviewing and Education

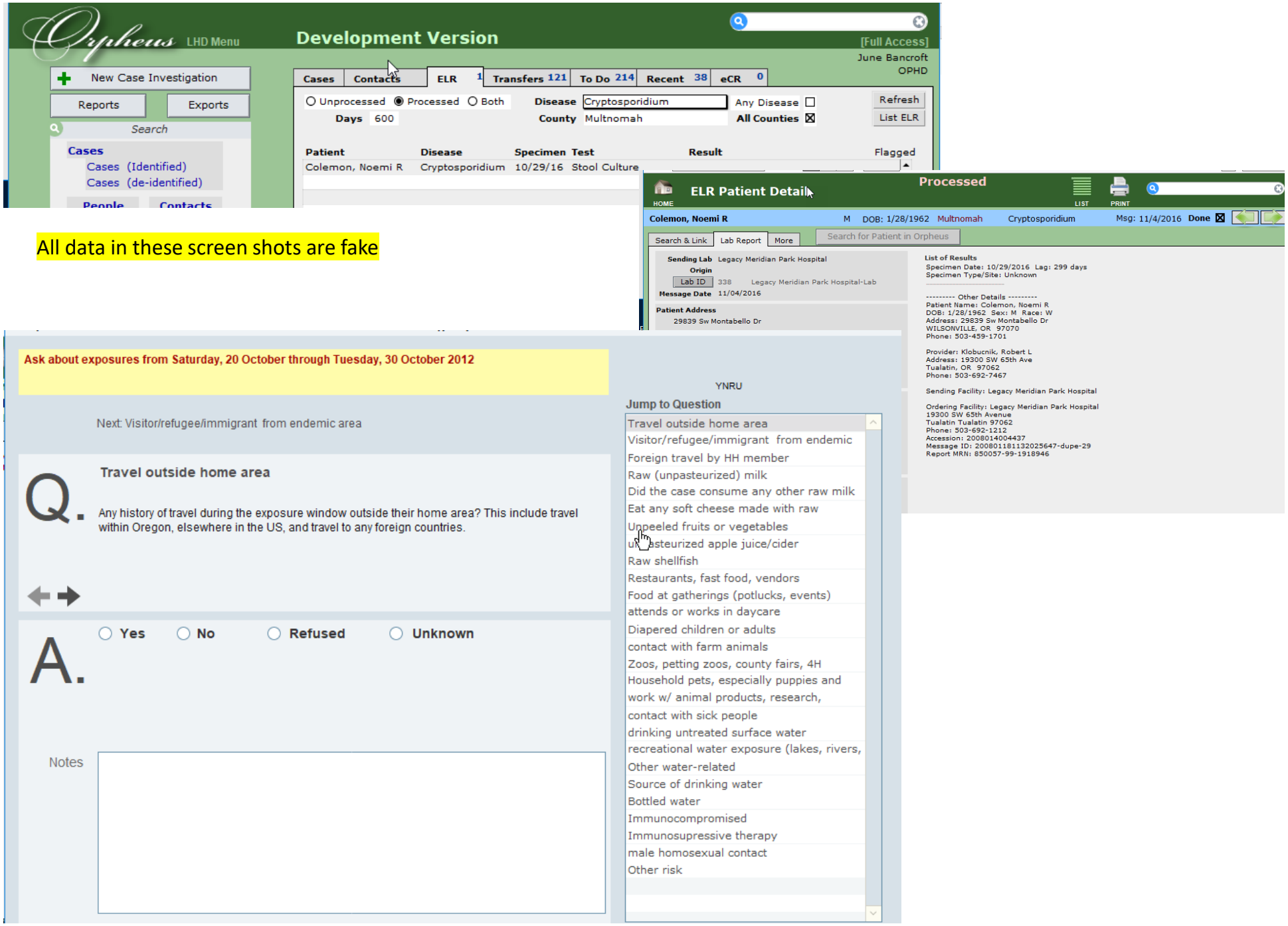
4.1 Identify Source of Infection

Ask about possible exposures in the 2 to 12 days before onset, including:

- Name, diagnosis, and phone number or any acquaintances or household member with a similar illness. (N.B. — anyone meeting the presumptive case definition should be reported and investigated in the same manner as a confirmed case);
- Attendance or work at a day care facility by the case or a household member;
- Source(s) of drinking water, including water at home and work, as well as streams, lakes or other un-treated sources;
- Recreational water exposures: lakes, rivers, swimming pools, water slides, etc.;
- Travel outside the area;
- Contact with livestock and other animals;
- Consumption of high-risk foods;
- Other high-risk exposures as detailed in the *Cryptosporidiosis* care report form or in the Orpheus risk/exposure section.

Managing Special situations

- Child in daycare
- Contaminated pool
- Incidence is higher than normal



All data in these screen shots are fake

Human/clinical laboratory testing

- Direct Florescent Antibody – (DFA) – Meriflour
- Indirect Immunoflorescent Assay- (IFA)
- Polymerase chain reaction (PCR) – BioFire, Nanosphere,
- Enzyme linked immuno-absorbent Assay –(EIA) - ProspecT
- Rapid Card Assays (RCA) tests – ImmunoSTAT card
- Modified Acid fast stains (MFA) -

Challenges to testing for *Cryptosporidium*

JOURNAL OF CLINICAL MICROBIOLOGY, Feb. 2003, p. 623–626 Vol. 41, No. 2
0095-1137/03/$08.00+0 DOI: 10.1128/JCM.41.2.623–626.2003

Evaluation of Three Commercial Assays for Detection of *Giardia* and *Cryptosporidium* Organisms in Fecal Specimens

Stephanie P. Johnston,[1]* Melissa M. Ballard,[2] Michael J. Beach,[1] Louise Causer,[1] and Patricia P. Wilkins[1]

Division of Parasitic Diseases, Centers for Disease Control and Prevention, Public Health Service, Department of Health and Human Services,[1] and the Atlanta Research and Education Foundation,[2] Atlanta, Georgia

2003 study

TABLE 2. Sensitivity and specificity of assays for the detection of *Giardia* and *Cryptosporidium* in stool specimens[a]

Assay	Sensitivity (%)	Specificity (%)
Giardia		
ProSpecT microplate EZ	90.6	99.5
ImmunoCard STAT!	81.3	99.5
Cryptosporidium		
ProSpecT microplate	70.3	99.5
ImmunoCard STAT!	67.6	99.0
Acid-fast stained smears	78.4	100.0

[a] The MERIFLUOR DFA test was used as the gold standard.

In low prevalence populations, ImmunoSTAT and ProspecT not recommended for screening or diagnosis

J Clin Microbiol. 2011 Apr; 49(4): 1605–1607.
doi: 10.1128/JCM.02074-10
Notes
PMCID: PMC3122847

Evaluation of Four Commercial Rapid Immunochromatographic Assays for Detection of *Cryptosporidium* Antigens in Stool Samples: a Blind Multicenter Trial

Patrice Agnamey,[1] Claudine Sarfati,[2] Claudine Pinel,[3] Meja Rabodoniriina,[4] Nathalie Kapel,[5] Emmanuel Dutoit,[6] Cécile Garnaud,[3] Momar Diouf,[7] Jean-François Garin,[2] Anne Totet,[1] F. Derouin,[2,*] and for the ANOFEL *Cryptosporidium* National Network

In a multicenter study, potassium dichromate–preserved stools from patients infected with *Cryptosporidium parvum* ($n = 20$), *C. hominis* ($n = 20$), and other *Cryptosporidium* species ($n = 10$) and 60 controls were examined using four immunochromatographic assays. Assay sensitivity ranged between 50.1% and 86.7% for *C. parvum* and C. *hominis* but was <35% for other species.

2010 Study

Remel, RIDA quick, ImmunoSTAT, Crypto-strip

Evaluation of the Positive Predictive Value of Rapid Assays Used by Clinical Laboratories in Minnesota for the Diagnosis of Cryptosporidiosis

Trisha J. Robinson, Elizabeth A. Cebelinski, Charlott Taylor, Kirk E. Smith

Clinical Infectious Diseases, Volume 50, Issue 8, 15 April 2010, Pages e53–e55,
https://doi.org/10.1086/651423
Published: 15 April 2010 **Article history**

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Abstract

We evaluated the positive predictive value (PPV) of rapid assays used by clinical laboratories in Minnesota to diagnose cryptosporidiosis. The overall PPV was 56% for rapid assays versus 97% for nonrapid assays; clinicians and laboratorians need to be aware of the low PPV of rapid assays when diagnosing cryptosporidiosis.

	Nonrapid assays				Rapid assays		
Period	Modified Kinyoun acid-fast stained smear	Wampole ELISA	MERIFLUOR DFA test	Any	Remel Xpect	ImmunoCard STAT!	Any
January–May Low prevalence season	100% (*n* = 1)	100% (*n* = 1)	100% (*n* = 2)	100% (*n* = 4)	33% (*n* = 6)	34% (*n* = 47)	34% (*n* = 53)
June–October High prevalence season	100% (*n* = 12)	…	95% (*n* = 19)	97% (*n* = 31)	70% (*n* = 10)	69% (*n* = 67)	69% (*n* = 77)
January–December	100% (*n* = 13)	100% (*n* = 1)	96% (*n* = 23)	97% (*n* = 37)	56% (*n* = 16)	56% (*n* = 126)	56% (*n* = 142)

NOTE. Confirmatory testing at the Minnesota Department of Health Public Health Laboratory was used as the gold standard to calculate PPVs. The months of November and December are not included in either the low or the high prevalence season. DFA, direct fluorescent antibody; ELISA, enzyme–linked immunosorbent assay.

Community Laboratory Testing for *Cryptosporidium*: Multicenter Study Retesting Public Health Surveillance Stool Samples Positive for *Cryptosporidium* by Rapid Cartridge Assay with Direct Fluorescent Antibody Testing

Dawn M. Roellig, Jonathan S. Yoder, Susan Madison-Antenucci, Trisha J. Robinson, Tam T. Van, Sarah A. Collier, Dave Boxrud, Timothy Monson, Leigh Ann Bates, Anna J. Blackstock, Shari Shea, Kirsten Larson, Lihua Xiao, Michael Beach

Published: January 13, 2017 • https://doi.org/10.1371/journal.pone.0169915

Abstract

Cryptosporidium is a common cause of sporadic diarrheal disease and outbreaks in the United States. Increasingly, immunochromatography-based rapid cartridge assays (RCAs) are providing community laboratories with a quick cryptosporidiosis diagnostic method. In the current study, the Centers for Disease Control and Prevention (CDC), the Association of Public Health Laboratories (APHL), and four state health departments evaluated RCA-positive samples obtained during routine *Cryptosporidium* testing. All samples underwent "head to head" re-testing using both RCA and direct fluorescence assay (DFA). Community level results from three sites indicated that 54.4% (166/305) of Meridian ImmunoCard STAT! positives and 87.0% (67/77) of Remel Xpect positives were confirmed by DFA. When samples were retested by RCA at state laboratories and compared with DFA, 83.3% (155/186) of Meridian ImmunoCard STAT! positives and 95.2% (60/63) of Remel Xpect positives were confirmed. The percentage of confirmed community results varied by site: Minnesota, 39.0%; New York, 63.9%; and Wisconsin, 72.1%. The percentage of confirmed community results decreased with patient age; 12.5% of community positive tests could be confirmed by DFA for patients 60 years of age or older. The percentage of confirmed results did not differ significantly by sex, storage temperature, time between sample collection and testing, or season. Findings from this study demonstrate a lower confirmation rate of community RCA positives when compared to RCA positives identified at state laboratories. Elucidating the causes of

2012-2014 Study

Conclusions: inherent specificity problems, more pronounced in >65 years

Oregon *Cryptosporidium* labs and methods used

Lab Name	Cryptosporidium testing method
Adventist	Merifluor DFA (Meridian)
Ashland	Done at Rogue Valley Medical Center
Bay Area Hospital	Merifluor DFA (Meridian)
Bay Clinic	Immunocard STAT! Crypto/Giardia (Meridian)
Columbia Memorial Hospital	Send to Legacy
Corvallis Clinic	Immunocard STAT! Crypto/Giardia (Meridian)
Good Samaritan Corvallis	Immunocard STAT! Crypto/Giardia (Meridian)
Good Shepherd	Send out to Tri-Cities Lab, WA, Also run BioFire PCR
Grande Ronde	Send out to Quest
Interpath	ProSpecT Cryptosporidium (Remel)
Kaiser	Immunocard STAT! Crypto/Giardia (Meridian)
LabCorp (Seattle)	Modified Acid Fast, if EIA ordered send to LabCorp Burlingame
Legacy	Immunocard STAT! Crypto/Giardia (Meridian) or included as part of BioFire GI PCR panel (provider order choice)
McKenzie-Willamette	Send out to LabCorp
Mercy Med Center	Immunocard STAT! Crypto/Giardia (Meridian) or included as part of BioFire GI PCR panel (provider order choice)
Mid Columbia Medical Center	Send out to Quest
Multnomah County	Fluorescent stain microscopy
North Bend Medical Center	Immuocard STAT! Crypto/Giardia (Meridian)
PeaceHealth	Immuocard STAT! Crypto/Giardia (Meridian)
Portland Clinic	Send out depends on insurance
Providence Medford	Testing done at Providence Portland
Providence Portland –	Immunocard STAT! Crypto/Giardia (Meridian)
Rogue Valley Medical Center	Immunocard STAT (Meridian)
Quest	Depends on physician order - DFA done at Quest West Hills, CA; EIA Nichols, Valencia, CA
Salem Clinic	Giardia/Crypto Quik Chek (Alere)
Salem Hospital	Giardia/Crypto Quik Chek (Alere)
Santiam Memorial Hospital	BioFire Film Array

Provider option

ImmunoSTAT Card

CryptoNET-like Enhanced Surveillance

- March 2016, Letter to clinical laboratories requesting they forward specimens to OSPHL for genotyping
  - Routed on monthly basis to CDC
- 2016 (30%), 2017 (24%), 2018 (10%) of specimens are able to be amplified at CDC
- In January 2018, we began requesting an additional sample from tri county residents to see if this increases yield
- In May, we forwarded ImmunoSTAT positive specimens to Meridian lab for confirmation from two larger labs – 2/11 were confirmed

PUBLIC HEALTH SURVEILLANCE IMPLEMENTATION PROJECTS

EPA

Kickoff off in Spring/Summer 2017

WHAT IS PUBLIC HEALTH SURVEILLANCE?

Public Health Surveillance (PHS) is a component of a Water Quality Surveillance and Response System. PHS involves the analysis of public health data to detect an increase in disease or illness in a community, and an investigation to determine whether the increase in illness may be due to drinking water contamination.

WHY IS PHS VALUABLE TO DRINKING WATER UTILITIES?

- Utilize the existing expertise, resources, and tools of public health partners
- Enable more effective coordination with public health partners during a contamination incident
- Allow for earlier detection of possible water contamination thereby reducing consequences

WHAT IS A PHS IMPLEMENTATION PROJECT?

EPA is planning PHS Implementation Projects to encourage the development of active relationships between utilities and their public health partners and to leverage existing PHS capabilities as a tool for detecting possible water contamination. Each implementation project will involve one utility and its public health partners, with assistance provided by EPA to facilitate and guide the project.

BENEFITS OF PARTICIPATING IN A PUBLIC HEALTH SURVEILLANCE IMPLEMENTATION PROJECT

Utilities will collaborate with public health partners to establish a coordinated process for investigating and responding to possible water contamination. During this project, the utility and public health partners will:

- Gain a mutual understanding of each other's capabilities and responsibilities for detecting water quality problems
- Develop a procedure for the joint investigation of a possible water contamination incident
- Participate in a tabletop exercise involving hypothetical water contamination scenarios

UTILITY REQUIREMENTS AND ANTICIPATED TIME FRAME

Participating utilities would need to commit time to the following activities:

- Identify and engage local public health partners
- Develop presentation materials to support meetings with public health partners
- Develop a procedure for investigating a possible water contamination incident
- Participate in the development and conduct of a tabletop exercise

Utilities should expect the implementation project to span a 6-month time period beginning in the spring/summer of 2017. The project will involve several teleconference planning meetings, a half-day in-person meeting with public health partners, a tabletop exercise, and a debrief/lessons learned session.

FOR MORE INFORMATION

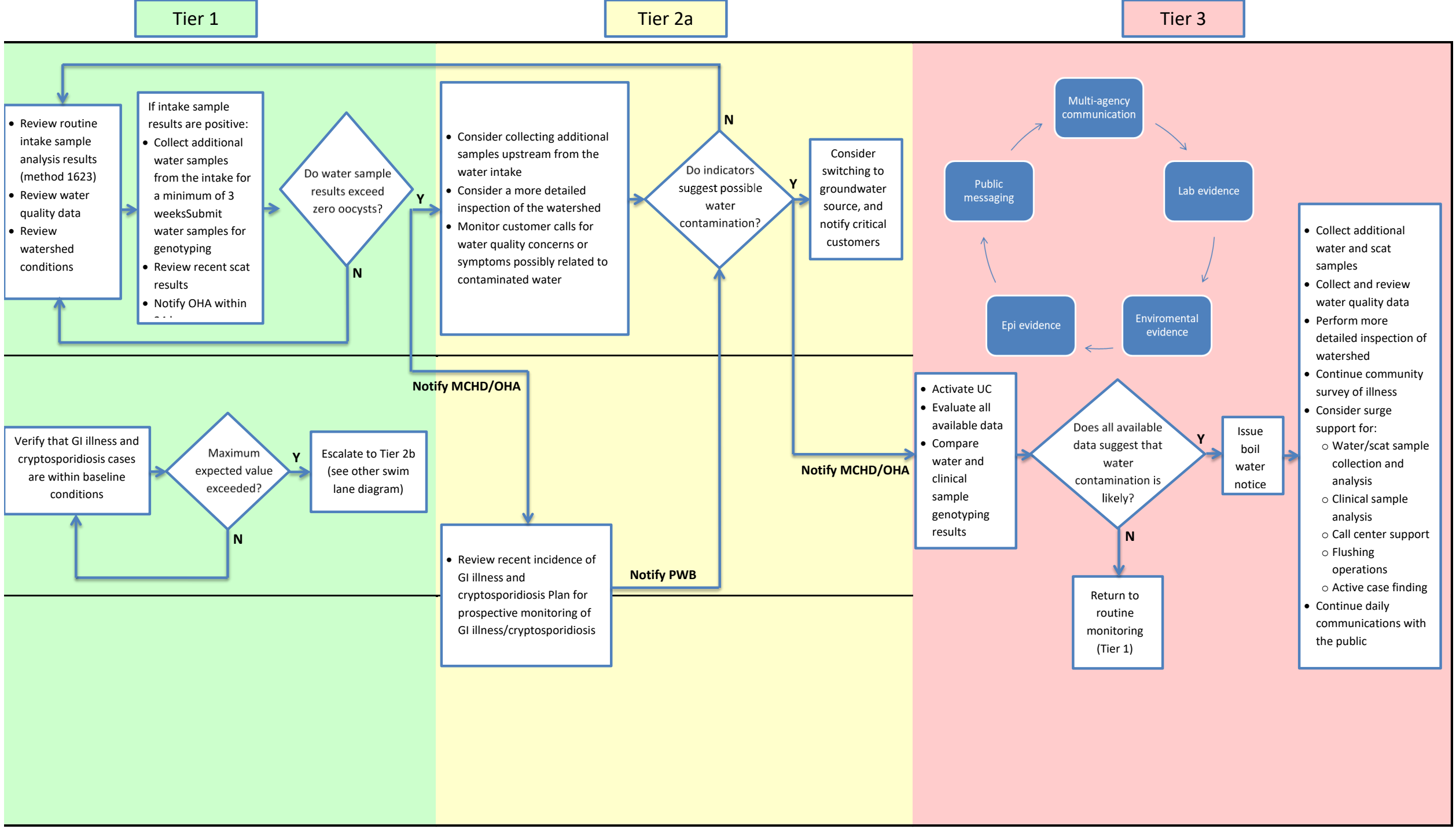
If you would like to learn more, and possibly participate in a PHS Implementation Project, please email or call Steve Allgeier, EPA, Office of Ground Water and Drinking Water (Allgeier.Steve@epa.gov; 513-569-7131)

Capabilities Assessment
Work shop and
Table top Exercise

Oregon Health Authority

Table top and workshop objectives

- Drinking water *Cryptosporidium* test results raise concerns that there may be a risk to utility's customers, or
- Cases of cryptosporidiosis in the population served by the utility exceed the baseline and contaminated drinking water cannot be ruled out as a possible cause of the increase in cases.
- Workshop – to identify gaps and data sources, protocols that need to be in place, data use issues.
- Table top exercise – work through issuing an extended boil water alert


Tier 1
Tier 2a
Tier 3
Review routine intake sample analysis results (method 1623)
Review water quality data
Review watershed conditions
If intake sample results are positive:
Collect additional water samples from the intake for a minimum of 3 weeksSubmit water samples for genotyping
Review recent scat results
Notify OHA within
Do water sample results exceed zero oocysts?
Y
N
Consider collecting additional samples upstream from the water intake
Consider a more detailed inspection of the watershed
Monitor customer calls for water quality concerns or symptoms possibly related to contaminated water
Do indicators suggest possible water contamination?
N
Y
Consider switching to groundwater source, and notify critical customers
Notify MCHD/OHA
Verify that GI illness and cryptosporidiosis cases are within baseline conditions
Maximum expected value exceeded?
Y
N
Escalate to Tier 2b (see other swim lane diagram)
Notify MCHD/OHA
Review recent incidence of GI illness and cryptosporidiosis Plan for prospective monitoring of GI illness/cryptosporidiosis
Notify PWB
Multi-agency communication
Lab evidence
Enviromental evidence
Epi evidence
Public messaging
Activate UC
Evaluate all available data
Compare water and clinical sample genotyping results
Does all available data suggest that water contamination is likely?
Y
N
Issue boil water notice
Return to routine monitoring (Tier 1)
Collect additional water and scat samples
Collect and review water quality data
Perform more detailed inspection of watershed
Continue community survey of illness
Consider surge support for:
Water/scat sample collection and analysis
Clinical sample analysis
Call center support
Flushing operations
Active case finding
Continue daily communications with the public

Stakeholders

- Portland Water Bureau
- Regional Water Consortium
- Multnomah, Washington, Clackamas, Clark Counties
- Oregon Health Authority
- Environmental Protection Agency
- Poison Center
- Oregon Emergency Management
- Center for Disease Control and Prevention
- Local Area Hospital Systems

- Discharge Diagnoses
- Chief Complaint Syndromes
  - Primary reason for seeking healthcare
  - Search free text fields
  - ~12 syndrome categories in ESSENCE
  - Subsyndromes
    - *Ex) Gasterointestinal illness: AbdominalPain or Bloating or Gastroenteritis or GIBleeding or LossOfAppetite or NVD or FoodPoisoning*
- Triage notes
  - Provider's description at triage or patient intake.
  - Phrases or full sentences
  - Typically include description of symptoms and relevant events

Oregon Health Authority

Challenges and Limitations

- Gastroenteritis is a broad category
- Less specific then traditional case reporting and visits are easily misclassified
- Limited patient information available
- Each information system (ED, Urgent care)has a unique installation
- Lack of experience using syndromic for infectious disease

Use and Interpretation of data

ESSENCE

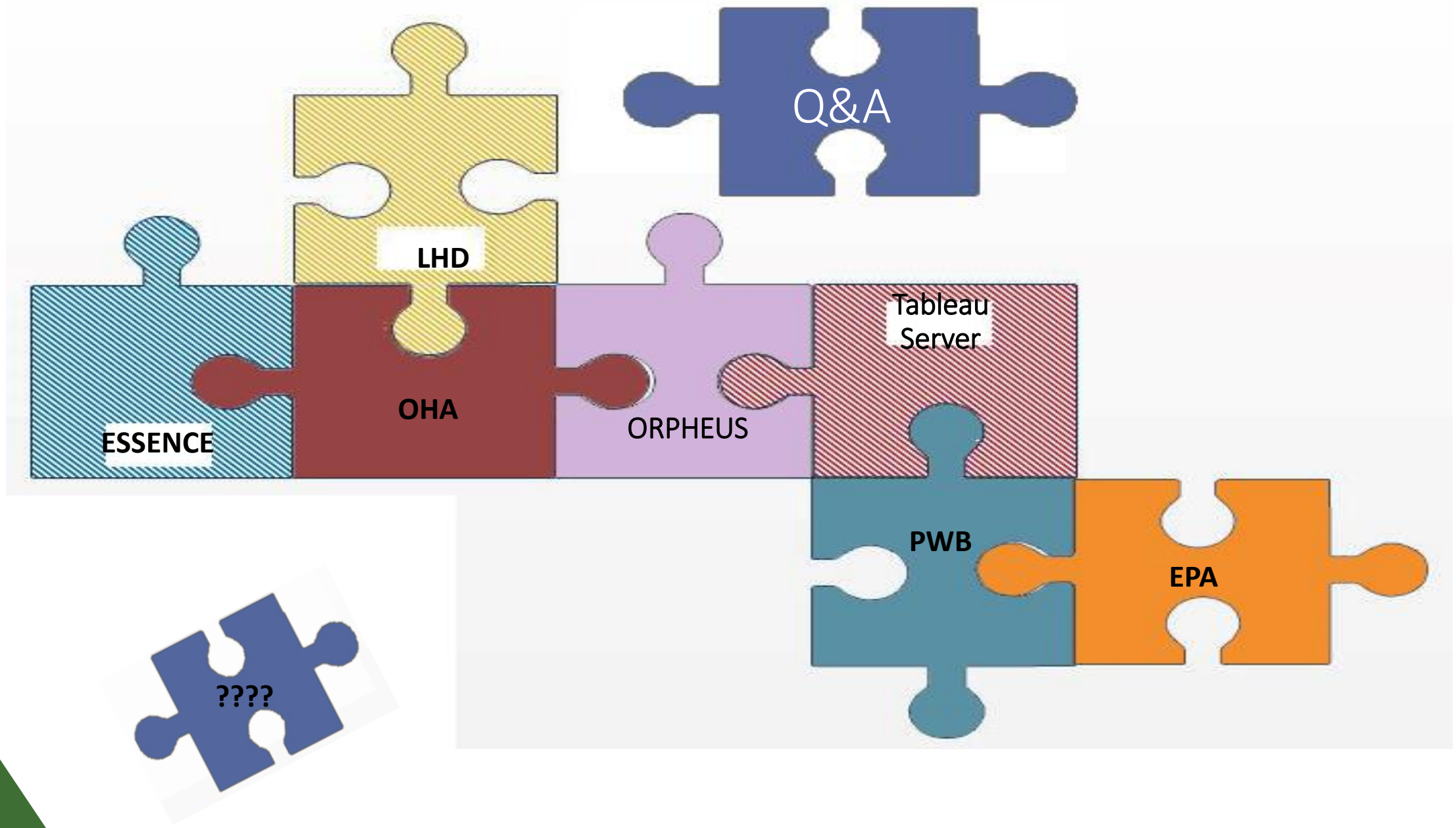
- Provide early information; near real time
- Potential to detect clusters early
- Does not require a diagnoses
- Does not require lab confirmation

Situational Awareness

- Comprehension of a dynamic environment
- Leveraging data to support public health investigation and/or action

Where we are at

- ESSENCE is a existing statewide data stream which can provide additional data during public health events
- Syndromic data, though de identified, can be linked to protected health information and thus requires specific security parameters
- Existing syndrome definitions require refinement due to the uniqueness of each data source – working on the validation of a case definition for Crypto.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