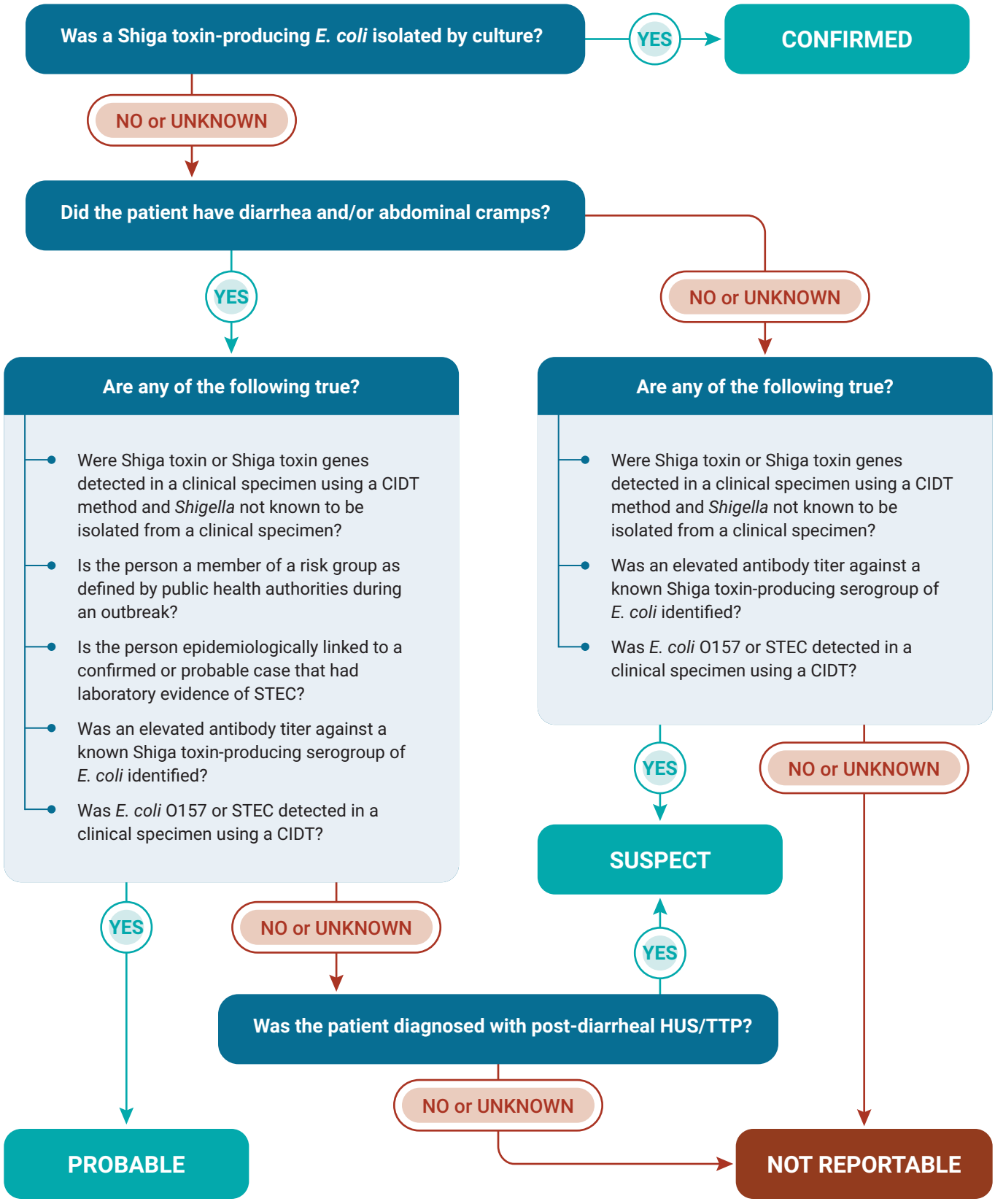
Algorithm for Case Classification: Shiga Toxin-Producing *E. coli*

WASHINGTON Integrated Food Safety Center of Excellence



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Frequently Asked Questions and Answers

What's with the alphabet soup of acronyms?

CIDT (Culture Independent Diagnostic Test): A test that does not rely on culturing the organism and instead looks for organism-specific nucleic acids or antigens.

STEC: Shiga toxin producing E. coli; may also be referred to as EHEC (Enterohemorrhagic *E. coli*).

EIA (Enzyme immunoassay): A type of test that is used to detect Shiga toxins.

PCR (Polymerase chain reaction): A type of test that is used to detect the DNA sequences that code for the Shiga toxins OR can be used to detect a gene specific to the *E. coli* O157 serogroup.

Why is the lab testing so complicated?

There are two main ways that STEC is identified — by detecting the Shiga toxins (or genes for these toxins), and by isolating the actual *E. coli* bacteria that produce the toxins. The recommended testing algorithm for clinical labs it to test for Shiga toxin (by EIA or PCR) and also attempt culture for *E. coli* O157. Culture for non O157 STEC is much more complicated than O157 and is typically only done at a public health laboratory (PHL). Clinical labs should submit Shiga toxin specimens or broths to the PHL for confirmation (or an isolate if the lab performs O157 culture). The PHL will attempt both culture and Shiga toxin testing on each specimen submitted, even if the Shiga toxin EIA is negative at the PHL.

I'm waiting on the PHL final result, why does it take so long?

There are multiple steps to confirm a STEC result by culture. The PHL has the ability to identify and provide a final result for the most common STEC serogroups, but others will need to be sent to the CDC lab for identification, and this process can take several months to complete. If PHL needs to send an isolate to CDC, that will be noted on the report and the result listed as "*Escherichia coli*, NOS" to indicate that the serogroup is 'not otherwise specified.' Cases with this result may be classified as confirmed cases without waiting for the final serogroup result.

The PHL said the specimen was negative — what happened, and how do I classify the case?

Due to the variable sensitivities and specificities of CIDT methods and the potential for degradation of Shiga toxin in a specimen during transit, discordant results may occur between clinical and public health laboratories. Persons with (1) detection of Shiga toxin or Shiga toxin genes using a CIDT and (2) the absence of isolation of *Shigella* from a clinical specimen, should be classified as a suspect or probable case, regardless of whether detection of Shiga toxin or Shiga toxin genes is confirmed by a public health laboratory.

It's an STEC case definition, why does it talk about *Shigella*?

Rarely, *Shigella* spp. (especially *S. dysenteriae*) produce Shiga toxins. When *Shigella* spp. are isolated from a Shiga toxin positive stool, it is considered a shigellosis case, and should be classified as a shigellosis case, not STEC.

I got a lab report for EAEC/EPEC/ETEC/EIEC, what's the deal?

Many laboratories now use multiplex gastrointestinal illness (GI) panels that can detect more than 20 pathogens. Enteroaggregative *E. coli* (EAEC), Enteropathogenic *E. coli* (EPEC), and Enterotoxigenic *E. coli* (ETEC) are different types of *E. coli* that cause diarrheal illness, but they do not produce Shiga toxin and do not cause STEC infection.

Enteroinvasive *E. coli* (EIEC) is a diarrhea-causing organism that cross-reacts with some *Shigella* PCRs and results from these tests are reported out as "*Shigella* spp./EIEC detected." Per CDC guidance, cases testing positive for *Shigella*/EIEC are considered shigellosis cases.