

Shiga toxin-producing *E. coli* v1 **Definition Factsheet & Technical Brief**

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Definition Purpose: Created by the CDC National Syndromic Surveillance Program (NSSP) for use with emergency department data to develop queries for all National Notifiable Diseases defined by the National Notifiable Diseases Surveillance System (NNDSS). Please note that while the disease queries are developed using the NNDSS case definition as the basis for identifying patient visits of interest, the queried patient visits themselves may or may not represent a case patient in NNDSS and further public health investigation will most often be required. This query is intended to be a version 1 and may be further improved upon by the NSSP community of practice in the future. This query is intended to be narrow and capture visits with specific terms to support greater monitoring and actionable public health data. More complex and/or broader queries may exist that more broadly capture symptoms or travel-based terms.

New or Revised Definition: New Definition

Date Added to ESSENCE: April 2026

Definition Description: Designed to capture emergency department visits with a diagnostic code or textual indicator of possible Shiga toxin-producing *E. coli* infection.

Use-Cases for Definition:

Case-finding: Primary

Trend monitoring: Not Intended as Use Case

Early outbreak detection: Secondary

Emergent Condition: Not Intended as Use Case

Justification: No query definition exists for Shiga toxin-producing *E. coli* infections. CDC wants to use emergency department data to find potential cases or identify outbreaks.

Data Source During Development: Emergency Department Visits. Chief Complaint Query Validation dataset (CCQV) in ESSENCE.

Development Methods:

1. The CDC team used the NNDSS case definition of Shiga toxin-producing *E. coli* to identify diagnostic codes (International Classification of Diseases, 9th & 10th Revision (ICD-9-CM, ICD-10-CM), SNOMED Clinical Terms (CT)) and chief complaint free-text for syndrome development.

2. The codes and free text were then categorized as inclusion or exclusion terms. These terms were formatted for querying in ESSENCE.
3. Text analysis was conducted on the initial query to find additional inclusion or exclusion terms.
4. The query was cross-checked internally as NSSP and by CDC subject matter experts as needed.

Validation Methods: This definition is part of the collection of definitions created by CDC NSSP for the rapid reportables project. The rapid reportables project is led by the CDC NSSP team to create definitions for all nationally reportable diseases. These definitions focus on chief complaint text and diagnostic codes of the disease or its causative agents with no mention of symptoms. Select members of the Community of Practice were then asked to review line-level results for their jurisdictions and provide feedback to ensure the intended results of the definitions were met.

Definition Fields and Structure:

The Chief Complaint Discharge Diagnosis (CCDD) parsed field is used to query both the discharge diagnosis codes and chief complaint free text, and exclusions are incorporated as necessary.

- Inclusion based on Shiga toxin-producing *E. coli* complaint free text terms:
 - The visit is included if it contains:
 1. A chief complaint related to disease name – (“shiga” OR “shinga”)
 2. Nested chief complaint terms indicating *E. coli* (“ecoli” OR “e coli” OR “escherichia coli” OR “O157”) AND mention of toxin - (“toxin” OR “txn”)) **OR**
 3. A chief complaint related to abbreviation of disease name – (“STEC” or “VTEC” or “EHEC”) **OR**
- Inclusion based on ICD-10 discharge diagnosis codes related to Shiga toxin-producing *E. coli*:
 - The visit is included if it contains:
 1. A discharge diagnosis code for Shiga toxin-producing *Escherichia coli* – (B96.21 OR B96.22 OR B96.23) **OR**
- Inclusion based on ICD-9 discharge diagnosis codes related to Shiga toxin-producing *E. coli*:
 - The visit is included if it contains:
 1. A discharge diagnosis code for Shiga toxin-producing *Escherichia coli* – (041.41 OR 041.42 OR 041.43) **OR**
- Inclusion based on SNOMED discharge diagnosis codes related to Shiga toxin-producing *E. coli*:
 - The visit is included if it contains:
 1. A discharge diagnosis code for Shiga toxin-producing *Escherichia coli* – (838549008) **OR**
 2. A discharge diagnosis code for Shiga toxin – (255835006) **OR**
 3. A discharge diagnosis code for infections caused by Shiga toxin-producing *Escherichia coli* – (328291000119103)
- There are no exclusions in this query.

Detailed Definition Components

Table 1. Inclusion and exclusion terms.

Terms	Description
<i>Inclusion</i>	
International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM)	
B96.21	Shiga toxin-producing <i>Escherichia coli</i> [E. coli] [STEC] O157 as the cause of diseases classified elsewhere
B96.22	Other specified Shiga toxin-producing <i>Escherichia coli</i> [E. coli] [STEC] as the cause of diseases classified elsewhere
B96.23	Unspecified Shiga toxin-producing <i>Escherichia coli</i> [E. coli] [STEC] as the cause of diseases classified elsewhere
International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)	
041.41	Shiga toxin-producing <i>Escherichia coli</i> [E. coli] (STEC) O157
041.42	Other specified Shiga toxin-producing <i>Escherichia coli</i> [E. coli] (STEC)
041.43	Shiga toxin-producing <i>Escherichia coli</i> [E. coli] (STEC), unspecified
SNOMED Concepts	
838549008	Shiga toxin-producing <i>Escherichia coli</i> (organism)
255835006	Shiga toxin (substance)
328291000119103	Infection caused by Shiga toxin producing <i>Escherichia coli</i> (disorder)
Chief Complaint	
“shiga”	Disease name
“shinga”	Disease name
“STEC”	Abbreviation of disease name
“VTEC”	Abbreviation of disease name
“EHEC”	Abbreviation of disease name
“ecoli” AND “toxin” OR “txn”	Nested terms
“e coli” AND “toxin” OR “txn”	Nested terms
“Escherichia coli” AND “toxin” OR “txn”	Nested terms
“O157” AND “toxin” OR “txn”	Nested terms

Table 2. ESSENCE syntax for the CCDD parsed field

!shiga!,OR,!shinga!,OR,!STEC!,OR,!VTEC!,OR,!EHEC!,OR,(,^ecoli^,OR,^E coli^,OR,^Escherichia coli^,OR,^O157^),AND,(,^toxin^,OR,^txn^),OR,^;B962[123]^,OR,^;0414[123];^,OR,^;838549008;^,OR,^;255835006;^,OR,^;328291000119103;^

Use the following URL and click Configuration Options to see the query setup:

[https://essence2.syndromicsurveillance.org/nssp_essence/servlet/TemporalTimeSeriesViewer?endDate=4Apr2026&percentParam=noPercent&datasource=va_erccdd&detector=nodetector&CCDDParseDFreeText=!shiga!,OR,!shinga!,OR,!STEC!,OR,!VTEC!,OR,!EHEC!,OR,\(,%5Eecoli%5E,OR,%5EE%20coli%5E,OR,%5EEscherichia%20coli%5E,OR,%5EO157%5E,\).AND,\(,%5Etoxin%5E,OR,%5Etxn%5E,\).OR,%5E;B962%5B123%5D%5E,OR,%5E;0414%5B123%5D;%5E,OR,%5E;838549008;%5E,OR,%5E;255835006;%5E,OR,%5E;328291000119103;%5E%20&startDate=4Jan2026&timeResolution=weekly&hasBeenE=1&userId=5024&aqtTarget=TimeSeries](https://essence2.syndromicsurveillance.org/nssp_essence/servlet/TemporalTimeSeriesViewer?endDate=4Apr2026&percentParam=noPercent&datasource=va_erccdd&detector=nodetector&CCDDParseDFreeText=!shiga!,OR,!shinga!,OR,!STEC!,OR,!VTEC!,OR,!EHEC!,OR,(,%5Eecoli%5E,OR,%5EE%20coli%5E,OR,%5EEscherichia%20coli%5E,OR,%5EO157%5E,).AND,(,%5Etoxin%5E,OR,%5Etxn%5E,).OR,%5E;B962%5B123%5D%5E,OR,%5E;0414%5B123%5D;%5E,OR,%5E;838549008;%5E,OR,%5E;255835006;%5E,OR,%5E;328291000119103;%5E%20&startDate=4Jan2026&timeResolution=weekly&hasBeenE=1&userId=5024&aqtTarget=TimeSeries)

Syntax Plain Language Description The definition uses discharge diagnosis codes and free-text chief complaint terms. The definition requires that an emergency department visit contains a reference to the disease by its discharge diagnosis code (in at least one of the following: ICD-10-CM, ICD-9-CM, SNOMED diagnostic codes), or by the disease or pathogen name listed in the chief complaint text. Therefore, the Shiga toxin-producing *E. coli* surveillance definition includes ICD-10-CM, ICD-9-CM, and SNOMED diagnostic codes for Shiga toxin-producing *E. coli*, along with direct mentions of Shiga toxin-producing *E. coli* using “shiga”, potential misspellings (“shinga”), abbreviations (“STEC”, “VTEC”, “EHEC”), and combinations of *E. coli* (“E coli”, “Escherichia coli”) with a mention of a toxin (“toxin”, “txn”) in the chief complaint field.