

Position Statement Template

Submission Date: 7/6/2005

Committee: Infectious Diseases
05-ID-07

Title: Revision of the Enterohemorrhagic *Escherichia coli* (EHEC) condition name to Shiga toxin-producing *Escherichia coli* (STEC) and Adoption of serotype specific national reporting for STEC

Statement of the Problem:

Escherichia coli O157:H7 was first recognized as a major foodborne pathogen in the 1980s after the investigation of several notable outbreaks. Subsequently, other serotypes of *E. coli* were identified which produce Shiga toxin and cause indistinguishable clinical illness, including progression to the hemolytic uremic syndrome in a fraction of those infected. In 1995, *E. coli* O157:H7 was made a nationally notifiable disease. In part due to the increasing recognition of the burden of non-O157 Shiga toxin-producing *E. coli*, and in part because clinical laboratories could test for it, the nationally notifiable condition was expanded in 2000 to include all Shiga toxin-producing *E. coli* causing clinical illness, referred to as Enterohemorrhagic *E. coli* (EHEC). Because EHEC is a specific term referring to a subset of Shiga toxin-producing *E. coli* strains, most of which produce intimin (*eae*) and enterohemolysin (*Ehly*), and because most laboratories do not identify these virulence factors, we propose that the condition under surveillance is most accurately referred to as STEC.

The epidemiology and clinical consequences of infection with the different serotypes of STEC are distinctive but poorly understood in the United States, making it important to distinguish among serotypes in surveillance. However, the Nationally Notifiable Diseases Surveillance System (NNDSS) does not include information concerning subtypes of organisms. To capture general information concerning the numbers of illnesses due to O157 and non-O157 serogroups of STEC, three reporting categories were developed, namely “Enterohemorrhagic *E. coli* (sic) O157:H7”, “Enterohemorrhagic *E. coli* (sic), Shiga toxin positive (not serogrouped)” and “Enterohemorrhagic *E. coli* (sic) (serogroup non-O157)” (see 2000 EHEC Case Definition attached). These reporting categories allowed analyses of surveillance data based on a basic distinction between O157 and non-O157 serogroups in STEC surveillance, but not among the many individual serotypes of STEC. In addition, these categories are incomplete and confusing, especially in categorizing STEC serotype O157:non-motile (NM).

A laboratory-based national surveillance system, the Public Health Laboratory Information System (PHLIS), has been used to capture the serotype of a subset of cases for which isolates are reported through the public health laboratories.

Specific isolate serotype information is captured in this system and has been used to report the numbers of reported STEC isolates among serotypes.

With the advent of the National Electronic Diseases Surveillance System (NEDSS), there is an opportunity to integrate and enhance surveillance activities. A foodborne and diarrheal diseases program area module has been developed for NEDSS which can capture information on any STEC serotype. This module is planned to collect information for the National Notifiable Diseases Surveillance System and for PHLIS. Information about specific STEC serotypes may be collected in NEDSS to allow more complete analysis of STEC disease surveillance among all serotypes.

Statement of the desired action(s) to be taken:

Change the Nationally Notifiable Diseases Case Definition designation from EHEC to STEC and include specific serotypes of isolates from cases, when possible. Remove from the NNDSS conditions list “Enterohemorrhagic *E. coli* O157:H7”, “Enterohemorrhagic *E. coli*, Shiga toxin positive (not serogrouped)” and “Enterohemorrhagic *E. coli* (serogroup non-O157)”. For states which cannot report serotypes in NEDSS (or compatible systems), continue to report through NETSS until data can be transferred through NEDSS.

Public Health Impact:

STEC infections are an important cause of foodborne diseases, with over 100,000 illnesses, 3,000 hospitalizations and 90 deaths estimated to occur each year in the United States (1). Timely surveillance for all serotypes will allow enhanced recognition and investigation of potential outbreaks of illnesses due to STEC.

Not enough is known concerning the burden of disease and the clinical illness and outcomes among the many serotypes of STEC. Major food safety programs and regulations, such as Hazard Analysis and Critical Control Point (HACCP) administered by USDA and FDA, have been developed to control these pathogens. Serotype-specific surveillance will allow monitoring of the burden of disease among the serotypes over time and will allow the evaluation of the impact of these control programs. Changing the condition name from EHEC to STEC will bring the NNDSS nomenclature in line with established vocabulary.

1. Mead PS, Slutsker L, Dietz V, et al. Food-related illness and death in the United States. *Emerg Infect Dis* 1999;5:607-25.

Shiga toxin-producing *Escherichia coli* (STEC)
2005 Proposed Case Definition

Clinical description

An infection of variable severity characterized by diarrhea (often bloody) and abdominal cramps. Illness may be complicated by hemolytic uremic syndrome (HUS) or thrombotic thrombocytopenic purpura (TTP); asymptomatic infections also may occur and the organism may cause extraintestinal infections.

Laboratory criteria for diagnosis

Isolation of Shiga toxin-producing *Escherichia coli* from a clinical specimen. *Escherichia coli* O157:H7 isolates may be assumed to be Shiga toxin-producing. For all other *E. coli* isolates, Shiga toxin production or the presence of Shiga toxin genes must be determined to be considered STEC.

Case classification

Suspect:

A case of postdiarrheal HUS or TTP (see HUS case definition), or

Identification of Shiga toxin in a specimen from a clinically compatible case without the isolation of the Shiga toxin-producing *E. coli*.

Probable:

A case with isolation of *E. coli* O157 from a clinical specimen, without confirmation of H antigen or Shiga toxin production, or

A clinically compatible case that is epidemiologically linked to a confirmed or probable case, or

Identification of an elevated antibody titer to a known Shiga toxin-producing *E. coli* serotype from a clinically compatible case

Confirmed:

A case that meets the laboratory criteria for diagnosis. When available, O and H antigen serotype characterization should be reported.

Comment

For users of the legacy National Electronic Telecommunications System for Surveillance (NETSS), laboratory-confirmed isolates are also reported via the Public Health Laboratory Information System (PHLIS), which is managed by the Foodborne and Diarrheal Diseases Branch, Division of Bacterial and Mycotic Diseases, National Center for Infectious Diseases, CDC. NEDSS or compatible systems will eventually replace PHLIS and NETSS; users of NEDSS or compatible systems which report to CDC should not report via PHLIS.

Both asymptomatic infections and infections at sites other than the gastrointestinal tract, if laboratory confirmed, are considered confirmed cases that should be reported.

See also: 1996 and 2000 Case Definition

Coordination:

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Appendix 1

List of STEC serotypes most frequently referred to the National *E. coli* Reference Laboratory, CDC. This list is to be included in the NEDSS Foodborne and Diarrheal Diseases Program Area Module in the laboratory section. Other serotypes of STEC causing infection are possible; these other serotypes are to be written as indicated in the “STEC, serotype other (written in)” option.

STEC Serotype	SNOMED CODE*
No serology performed	L-15616
O157:H7	L-15611
O157:NM	L-15619
O157:H not typed	L-1560F
O26:H11	L-15685
O26:NM	L-15684
O26:H not typed	L-1561A
O111:H8	L-15699
O111:NM	L-15620
O111:H not typed	L-1561B
O103:H2	L-15695
O103:H25	unassigned
O103:H11	unassigned
O103:NM	unassigned
O103:H not typed	L-15694
O121:H19	L-156A1
O121:NM	unassigned
O121:H not typed	L-156A0
O45:H2	L-15687
O45:NM	unassigned
O45:H not typed	L-15686
O145:NM	L-156A7
O145:H not typed	L-156A6
O118:H16	L-1569F
O118:NM	unassigned
O118:H not typed	L-1569C
O91:H21	L-15693
O91:NM	L-15691
O91:H not typed	L-15690
O165:H25	L-156AE
O165:NM	L-156AD
O165:H not typed	L-156AC
O153:H2	L-156A8
O153:NM	unassigned
O153:H not typed	L-15635
ORough	L-156B1
Other (written in)	

* SNOMED are incomplete and undergoing revision, these codes may change accordingly

Appendix 2

Codes associated with Shiga toxin-producing *Escherichia coli* infections

SNOMED (see NCI website at: <http://nciterns.nci.nih.gov/NCIBrowser/Startup.do>)

SNOMED codes are available for many serotypes (see above). Codes are subject to change and should be updated accordingly.

ICD-10 codes (see <http://www3.who.int/icd/vol1htm2003/fr-icd.htm>)

A04.3 Enterohaemorrhagic *Escherichia coli* infection

LOINC codes*

COMPONENT	LOINC_NUM	Short Common Name
ESCHERICHIA COLI O157:H7	10851-4	E coli O157H7 Stl QI Cult
ESCHERICHIA COLI O157:H7 IDENTIFIED	12276-2	E coli O157H7 Stl Cult
ESCHERICHIA COLI SEROTYPE	20789-4	E coli Sertyp Islt
ESCHERICHIA COLI SHIGA-LIKE	21262-1	E coli SLTEC Stl QI EIA
ESCHERICHIA COLI SHIGA-LIKE	28035-4	E coli SLTEC XXX EIA-aCnc
ESCHERICHIA COLI SHIGA-LIKE IDENTIFIED	16835-1	E coli SLTEC Stl Cult
ESCHERICHIA COLI VEROTOXIC IDENTIFIED	16836-9	E coli VT Stl Cult
ESCHERICHIA COLI VEROTOXIN	16283-4	E coli VTN XXX QI
ESCHERICHIA COLI VEROTOXIN 1	6574-8	E coli VTN1 Stl
ESCHERICHIA COLI VEROTOXIN 2	6576-3	E coli VTN2 Stl
ESCHERICHIA COLI O157:H7 AB.IGG+IGM PANEL	35752-5	E coli O157H7 IgG+IgM Pan Ser

ESCHERICHIA COLI O157:H7 AB.IGM	35878-8	E coli O157H7 IgM Ser-aCnc
ESCHERICHIA COLI O157:H7 AB.IGG	35879-6	E coli O157H7 IgG Ser-aCnc

* Other LOINC codes may be applicable. LOINC codes are incomplete and undergoing revisions and additions; these codes may change accordingly.