Position Statement Template

Submission Date: 5/27/2005

Committee: Infectious Diseases
05-ID-07

Title: Proposal to change the Enterohemorrhagic *Escherichia coli* (EHEC) condition name to Shiga toxin-producing *Escherichia coli* (STEC) and to adopt 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 produced Shiga toxin and caused 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* which produces 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 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 serogroupes 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 includes many STEC serotypes. 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 the National Notifiable Diseases Surveillance System until data can be transferred though NEDSS.

Public Health Impact:

STEC infections are an important cause of foodborne diseases, with over 100,000 illnesses, 3,000 hospitalization 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 EHEC.

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 this pathogen. 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.

Laboratory criteria for diagnosis
Isolation and "O" and "H" antigen serotype characterization of Shiga toxin-producing *Escherichia coli*.*

Case classification
Suspect:
A case of postdiarrheal HUS or TTP (see HUS case definition)

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 Shiga toxin in a specimen from a clinically compatible case, or
Definitive evidence 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.

Comment
For users of the legacy National Notifiable Diseases Surveillance System, 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.

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

* *Escherichia coli* O157:H7 isolates may be assumed to be Shiga toxin-producing. For all other *E. coli* isolates, Shiga toxin production must be determined to be considered STEC. STEC isolates with incomplete serotype information should be reported with the extent of information available.

Coordination:

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