

TITLE: Enhancing local, state and territorial-based surveillance for invasive pneumococcal disease in children less than five years of age.

Statement of the problem: Before the 2000 implementation of routine childhood vaccination with 7-valent pneumococcal conjugate vaccine (PCV7), it has been estimated that *Streptococcus pneumoniae* caused 63,000 instances of invasive pneumococcal disease (e.g., meningitis, bacteremia) and was responsible for >125,000 hospitalizations for pneumonia and 10-15,000 deaths annually. Children less than five years of age are disproportionately affected by invasive pneumococcal disease (IPD) and infection with drug-resistant *S. pneumoniae* (DRSP). DRSP was added to the list of nationally notifiable diseases/conditions in 1994; IPD in children <5 years of age was added in 2000. Despite efforts to improve surveillance, data for *S. pneumoniae* is incomplete in many jurisdictions and insufficient to assess the impact of the PCV7 vaccine program.

In cooperation with 10 local and state health departments, the Centers for Disease Control and Prevention (CDC) conducts active, population- and laboratory-based surveillance for IPD in all age groups. Between 1998 and 2004, the incidence of IPD caused by pneumococcal serotypes covered in the PCV7 vaccine (19F, 14, 6, 18C, 23F, 4, 9V) among children aged <5 years declined by 97% in the eight continuously reporting surveillance sites (CDC, Active Bacterial Core surveillance, unpublished data). In 2004, coverage with ≥ 3 doses of PCV7 among children aged 19-35 months in these same sites ranged from 68-83%, however, in other areas of the country where surveillance data is limited, PCV7 coverage is variable (44-91%).

The capacity to serotype isolates of *S. pneumoniae* does not exist in most local, state or territorial public health laboratories and the capacity at CDC is limited. Thus, public health officials cannot characterize IPD serotype trends or detect the emergence of non-vaccine serotypes in their jurisdictions. Recently, polymerase chain reaction assay (PCR) was reported to be useful in distinguishing vaccine from non-vaccine serotypes when applied to pneumococcal isolates (R. Pai, et al. Jour Clin Micro, 2006; 44: 124-31). Many jurisdictions already obtain *S. pneumoniae* isolates from reporting laboratories and have public health laboratories with PCR capacity.

Expanding local, state and territorial public health laboratories' capacity by including PCR to distinguish vaccine from non-vaccine serotypes of *S. pneumoniae* represents an opportunity to improve surveillance for IPD and assess the burden of vaccine-preventable IPD within and among jurisdictions with widely varying PCV7 coverage and to detect the emergence of IPD related to non-vaccine serotypes. In addition, better data will allow public health officials evaluate the implementation of PCV7 immunization programs.

The National Notifiable Diseases Surveillance System (NNDSS) has two event codes for reporting IPD: DRSP (11720) and IPD in children <5 years of age (11717). These categories are not mutually exclusive and formal guidance to states for reporting these data are lacking. This situation can result in submissions of duplicate reports when a single case is entered using both event codes. In addition, meningitis caused by *S. pneumoniae* is reported using a separate event code.

Statement of the desired actions to be taken:

- 1.) Case classifications for DRSP and IPD are modified as below:
 - a. Isolates causing IPD from children <5 years of age for which antibacterial susceptibilities are available and determined to be DRSP should be reported ONLY as DRSP (11720).
 - b. Isolates causing IPD from children <5 years of age which are susceptible, or for which susceptibilities are not available should be reported ONLY as IPD in children <5 years of age (11717).
 - c. All other components of the case definitions remain as referenced.
 - i. CSTE Position Statement 2000 ID #6 <http://www.cste.org/position%20statements/SearchdbKeyword.asp> (IPD in children <5 years of age [11717])
 - ii. CSTE Position Statement 1994 ID #10 <http://www.cste.org/ps/1994/1994-nsc->

[10.htm](#) (DRSP-11720)

- 2.) CDC should create a single NEDSS Plan Platform for collection of IPD data.
- 3.) CDC should partner with local, state and territorial health departments to transfer the technology of PCR-based serotyping to state and territorial public health laboratories as soon as possible. This will eventually enhance jurisdictions' ability to better determine the burden of vaccine- and non-vaccine-preventable IPD among children <5 years of age.

Public health impact: Enhancing reporting of IPD will help to monitor the impact of immunization programs, track progress toward Healthy People 2010 objectives, and, in conjunction with reporting of drug-resistant strains, determine the burden of DRSP. Area-specific surveillance data will allow jurisdictions to monitor the impact of pneumococcal vaccine programs and inform policy and legislative decisions.

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