

TITLE: Validation of Data Representing Deaths Due to Vaccine-Preventable Diseases

Statement of the problem:

As deaths from many vaccine preventable diseases become rare, accurate ascertainment of such deaths becomes increasingly important. There are two systems in which deaths from vaccine-preventable diseases (VPD) of childhood are monitored: the National Center for Health Statistics (NCHS) death certificate system and the National Notifiable Disease Surveillance System (NNDSS). In the past, there have been discrepancies between deaths from vaccine preventable diseases reported to and from these two systems. It is particularly important that the NCHS system be accurate, as NCHS publishes official death statistics in the United States.

Validating data on rare deaths is an ongoing process between NCHS and state vital statistics offices. In some states this process works well, but in other states validations do not occur on a timely basis. In addition, there is no formal process to resolve discrepancies between deaths reported to NNDSS and those reported to NCHS and to enhance the NCHS data by including deaths reported to NNDSS that may not have been accurately reported to NCHS. In order to facilitate and improve efficiency and accuracy of the NCHS validation process and to minimize discrepancies between the two systems as they relate to rare causes of vaccine preventable deaths, it is proposed that existing relationships between CDC/National Immunization Program (NIP) and state epidemiologists and state immunization programs be used to augment the validation process of these deaths. By involving those responsible for surveillance of vaccine-preventable diseases to reconcile differences, and using the NCHS validation process to produce

an accurate death dataset, this should improve the accuracy and understanding of counts of deaths due to vaccine-preventable diseases without creating a new system.

Statement of desired action:

1. CSTE endorses an expanded method to validate rare deaths due to specific vaccine-preventable diseases. In principle, this method includes a) NCHS and NIP determining which rare VPD deaths reported to NNDSS have not been reported to NCHS and b) NIP working with state epidemiologists who will coordinate validation and reporting of these additional deaths through the state vital records office.

Diseases to be included in this process include:

- Whooping cough (A37)
- Measles (B05)
- Acute poliomyelitis (A80)
- Mumps (B26)
- Rubella (B06)
- Diphtheria (A36)
- Other tetanus (Tetanus) (A35)
- Congenital rubella syndrome (P35.0)
- Haemophilus influenzae
- Varicella (B01)

2. CSTE encourages State Epidemiologists and their infectious disease/vaccine-preventable disease surveillance staff to actively collaborate with their state vital records office to validate rare deaths from VPDs reported to NCHS.

3. CSTE encourages NCHS to consider adding deaths due to hepatitis A and hepatitis B in children under 20 years of age and deaths due to pneumococcal disease in children under 5 years of age to the list of rare causes of death to be validated.

Public Health Impact:

Two systems in the United States collect data on deaths related to vaccine-preventable diseases, the National Center for Health Statistics (NCHS), which published official death statistics in the United States, and the National Notifiable Disease Surveillance System (NNDSS). The NCHS system collects mortality information through death certificates filed from state offices of vital records. Medical information on death certificates is provided by physicians, coroners or medical examiners and this information is coded using the current revision of the International Classification of Diseases (ICD-10) according to what is listed as the underlying cause of death and any contributing causes. What is finally assigned as the cause of death depends on what condition(s) is (are) listed on the death certificate and the ICD coding rules. Coding mistakes

can be made. The NNDSS system is designed primarily to collect data on vaccine preventable disease morbidity and relies on passive disease reporting from physicians and laboratories through state epidemiology or immunization public health offices; morbidity (survived or died) is included on NNDSS reports only as one of many outcome and epidemiologic data which are usually gathered only after extensive follow-up and case investigation. Though this system is passive, for rare causes of vaccine preventable disease mortality, detailed case and/or death investigation is current practice and mistakes are unlikely. As varicella deaths have been nationally notifiable since 1999, most states should already be investigating all their varicella deaths.

In the past, comparing data on deaths collected from the NCHS and the NNDSS systems in 1998, there have been discrepancies between the 2 data sources. For example, 3 deaths were reported due to mumps in 1998, however investigation of the deaths revealed that 2 of them were not due to mumps and NCHS was able to work with state vital statistics offices to update the death files before release of annual death statistics. For other diseases, deaths were missed by one source or the other and deaths were more complete and accurate when both sources were used. Using both sources of data will allow more accurate classification of deaths due to vaccine preventable diseases.

The current list of rare causes of death to be validated does not include several vaccine-preventable diseases for which deaths are rare in children, if not the population as a whole. These diseases include hepatitis A, hepatitis B and pneumococcal disease. Deaths from each of these diseases should become increasingly rare with continued implementation of recent recommendations for universal vaccination of infants and children against them.

The impact will be to make the national death surveillance system more accurate and usable for monitoring rare deaths due to vaccine-preventable diseases. There should be no impact on the timing of release of national mortality statistics as the proposed method of validation is merely assuring application of the current validation system and using an additional source of data to improve accuracy of mortality data.

CDC Comments:

The diseases identified in the list - along with pneumococcal disease in children under 5 years of age, and hepatitis A and hepatitis B in all children - are already rare, and we agree that expanded methods for validation of rare deaths from vaccine preventable diseases are increasingly important. For monitoring vaccination programs, it is important to have the most reliable and accurate data possible on rare causes of diseases that are preventable by vaccination. Each death from acute hepatitis A or hepatitis B is a sentinel event which represents a failure of the public health system. CDC is currently discussing with CSTE the feasibility of including hepatitis A and B among the vaccine preventable diseases in the validation project.