

Detection of a Vaccine-preventable Reportable Disease: Comparison of Physician Reporting vs. an Electronic Syndromic Surveillance System

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BACKGROUND: Communicable diseases are underreported by physicians, especially diseases without laboratory tests. The goals of our study were to determine reporting levels for clinical chickenpox, describe clinical data elements common to chickenpox, and assess ability of an electronic syndromic surveillance system, BioSense, to capture chickenpox cases.

METHODS: The study took place in a healthcare system that provides care to over 25% of Denver, CO. All outpatient clinic visits with ICD-9 chickenpox codes (052) between 1/1/06 thru 3/31/07 were reviewed for consistency with our health department (CDPHE) case definition. Demographic, chief complaint, exam, laboratory, radiology, prescribing, and vaccination data were recorded. Cases that met CDPHE definitions for probable or confirmed chickenpox were compared with cases reported to CDPHE during the same time period, and with cases detected by BioSense during the period of its use (9/15/06-3/31/07).

RESULTS: 85 cases were detected by ICD-9 codes and 17 were excluded after chart review. Of the 68 cases, 43% were males and average age was 13 with Hispanic (74%), African-American (16%), and Caucasian (9%) descents.

Laboratory, radiology, and serology were ordered in 9%, 3%, and 4%, respectively. 7% had fever (>38C) on intake. 37% had varicella vaccine at a prior clinic visit. Chief complaints included rash (62%), chickenpox (24%), fever (12%), and itching (7%). Other complaints were hives (4%), sores (3%), bites (6%), blisters (3%), bumps (4%), "red" (7%) and/or lesion(s) (3%). 81% were prescribed medications during their visit, including dyphenhydramine or hydroxyzine (43%), acyclovir (24%), APAP or ibuprofen (16%), anti-itch creams or lotions (13%), and oral antibiotics (9%). Only 16% were captured by CDPHE through physician reporting. During the time period BioSense was utilized, 16/23 cases (70%) were detected as part of the rash syndrome.

CONCLUSIONS: Biosense was superior in detecting chickenpox in our system than current public reporting methods. BioSense's ability to capture clinical data such as rash through electronic means may explain superiority vs physician reporting. This has important implications for not only prevention, control, and monitoring of important diseases, but also in detecting agents of bioterrorism in which no lab data would likely be obtained, such as smallpox.