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Epi Monthly Report

Comparison of ICD-9-Coded Chief Complaints and Diagnoses for Identifying Gastrointestinal Syndrome Using ESSENCE

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Introduction

Due to the threat of bioterrorism and the emergence of new infectious diseases, the Miami-Dade County Health Department (MDCHD) has been using an Emergency Department (ED) based syndromic surveillance system since January 2005 to identify bioterrorism-associated or natural disease outbreaks before specific diagnoses are made. The Center for Disease Control and Prevention (CDC) has classified bioterrorism agents into categories based on priority, with Category A and B agents having the highest priority, respectively. Many of these agents can have gastrointestinal-related symptoms, such as forms of enteric tularemia, anthrax, botulism, salmonellosis, shigellosis, typhoid fever, cholera and others [1].

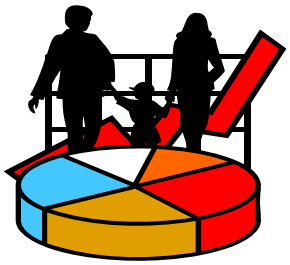
The purpose of this study was to determine if existing chief complaint and ICD-9 codes for detecting gastrointestinal syndrome correctly identify similar patterns of illness when applied to the Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE IV).

Methods

A retrospective review was conducted on the months of February, April, and June during the year 2005. These months were chosen as a random sample of the data received from one of the eight hospitals participating on the syndromic surveillance system. MDCHD creates daily reports based on the analysis of syndromic data through ESSENCE; the system automatically generates alerts or warnings due to observed increases in the number of ED visits. Gastrointestinal syndrome (GI) is one of the 11 syndrome categories monitored by ESSENCE in Miami-Dade participating hospitals. The GI syndrome category is composed of any combination of chief complaints of vomiting, diarrhea, nausea or abdominal pain. Miami-Dade has identified 73 ICD-9-coded diagnoses that correspond to the GI syndrome category. These diagnoses include: acute infections of the upper/lower GI tract; specific diagnoses of acute GI distress; and acute non-specific symptoms of GI distress. While diseases such as enteritis, gastritis, rotavirus, norovirus, and E. Coli are included, it excludes chronic conditions such as Irritable Bowel Syndrome. There were 24,522 emergency department visits reported during this time. Duplicated classifications of complaints were deleted and cases in which a chief complaint or diagnosis was missing were excluded.

Results

The sensitivity and specificity were calculated to be 83% and 87%. The positive predictive value was 49% while the negative predictive value was 97%. The overall accuracy was 87%. GI syndrome represented 24.2% of all emergency department visits during the study period. Though it was expected that there would be a significant increase in visits on the



FLORIDA DEPARTMENT OF HEALTH

Inside this issue:

Comparison of ICD-9-Coded Chief Complaints and Diagnoses for Identifying Gastrointestinal Syndrome Using ESSENCE 1

Avian Flu Watch 3

Selected Notifiable Disease Reports, Miami-Dade County, Comparison with Historical Data, October 2006 2

Monthly Report, Selected Reportable Diseases/ Conditions in Miami-Dade 4

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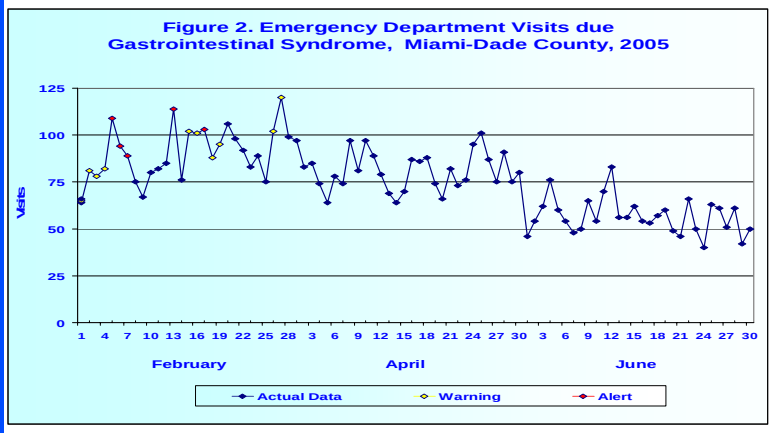
day after weekends and holidays, only the day after holidays had a heightened number of visits.

Figure 1. Sensitivity and Specificity of GI Syndrome

Measurement	Value	95% CI
Sensitivity	0.83	0.81-0.84
Specificity	0.87	0.86-0.89
PPV	0.49	0.48-0.51
NPV	0.97	0.96-0.97
Accuracy	0.87	0.86-0.89



Conclusions

Due to the high level of sensitivity and specificity, we concluded that the use of chief complaints data in syndromic surveillance yields similar results to the ones observed when utilizing ICD-9-coded diagnoses. Reports consistent with this observation have been generated by studies of respiratory illness and syndromic surveillance [2]. Since timeliness is a crucial factor in surveillance [3], ESSENCE may have the ability to provide early warning of gastrointestinal outbreaks. However, since many people with gastrointestinal illness do not visit an ED for care, increased morbidity with these diseases in the community could be unnoticed. Therefore, syndromic surveillance should not be the only source of identification of outbreaks.

References

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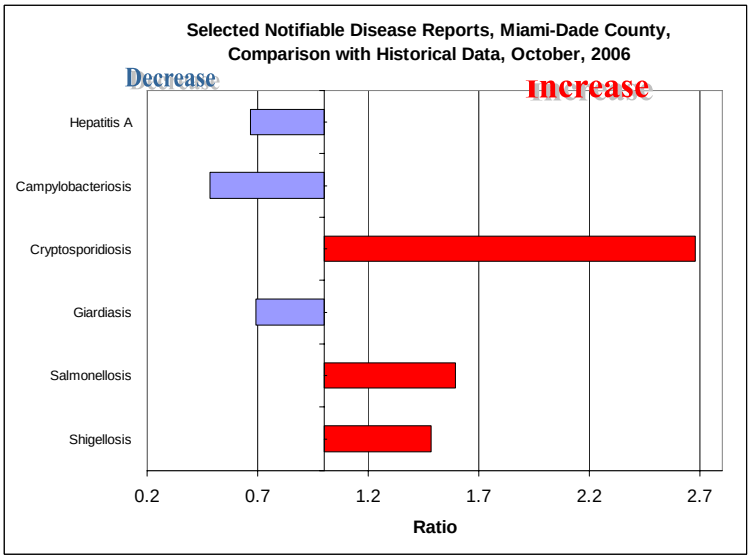
2. Espino, JU, Wagner MM. Accuracy of ICD-9-coded Chief Complaints and Diagnoses for the Detection of Acute Respiratory Illness. Washington, DC: AMIA 2001 Annual Symposium; 2001.
3. Lombardo JS, Burkom H, Pavlin J. ESSENCE II and the Framework for Evaluating Syndromic Surveillance Systems. MMWR. 2004:53:159-65.

TO REPORT ANY DISEASE AND FOR INFORMATION CALL:

Office of Epidemiology and Disease Control

Childhood Lead Poisoning Prevention Program	(305) 470-6877
Hepatitis	(305) 470-5536
Other diseases and outbreaks	(305) 470-5660
HIV/AIDS Program	(305) 470-6999
STD Program	*(305) 325-3242*
Tuberculosis Program	*(305) 324-2470*
Special Immunization Program	(786) 845-0550



AVIAN FLU WATCH

Unless indicated, information is current as of November 29, 2006

- **Since 2003, 258 human cases of avian influenza (H5N1) have been confirmed** by the World Health Organization (WHO). Of these, 154 have been fatal.

- **Countries with confirmed *human* cases** include Cambodia, China, Djibouti, Indonesia, Thailand, Vietnam, Iraq, Azerbaijan, Egypt and Turkey.

- **No human cases of avian influenza (H5N1) have been reported in the United States.**

- **There have been two additional confirmed human H5N1 cases occurring in Indonesia.** The most recent case was a 35-year-old female. This case from Banten Province developed symptoms November 7th and was hospitalized on November 10th. She died November 28th early in the morning. The source of exposure is still under investigation. Prior to this case, a 30-month-old male developed symptoms November 5th, was hospitalized November 10th, and died November 13th. During the initial source exposure investigation for this case, reports of chicken deaths near his home were found. Of the 74 confirmed cases in Indonesia, 57 have been fatal.

- **H5N1 has been confirmed in *birds* in several other countries since 2003.** H5N1 has been documented in birds in more than 30 countries in Europe & Eurasia, South Asia, Africa, East Asia and the Pacific, and the Near East. For a list of these countries, visit the World Organisation for Animal Health Web Site at http://www.oie.int/downld/AVIAN%20INFLUENZA/A_AI-Asia.htm.

- **No restrictions on travel to affected countries have been imposed.** Travelers should avoid contact with live poultry and monitor their health for ten days after returning from an affected country.

PARTICIPATE IN INFLUENZA SENTINEL PROVIDER SURVEILLANCE

Why does Florida need influenza sentinel providers?

Sentinel providers are key to the success of the Florida Department of Health's Influenza Surveillance System. An influenza sentinel provider conducts surveillance for influenza-like illness (ILI) in collaboration with the Florida State Health Department, Bureau of Epidemiology and the Centers for Disease Control and Prevention (CDC). Data reported by sentinel providers, in combination with other influenza surveillance data, provides a national picture of influenza virus and ILI activity in the U.S. and Florida.

What data do sentinel providers collect and how do they report?

Sentinel providers report the total number of patient visits each week and number of patient visits for ILI by age group (0–4 years, 5–24 years, 25–64 years, and ≥ 65 years) year round. These data are transmitted once a week via the internet or via fax to a central database at CDC. Most providers report that it takes **less than 30 minutes a week** to compile and report their data. In addition, sentinel providers can submit specimens from a subset of patients to the state laboratory for virus isolation **free of charge**.

Who can be an Influenza Sentinel Provider?

Providers of any specialty (e.g., family practice, internal medicine, pediatrics, infectious diseases) in any type of practice (e.g., private practice, public health clinic, urgent care center, emergency room, university student health center) are eligible to be sentinel providers.

Why Volunteer?

Epidemics of influenza usually occur during the winter months and are responsible for approximately 36,000 deaths per year in the United States. Influenza and pneumonia together were the eighth leading cause of death in Florida in 2004, with over 3,000 deaths statewide. Serious complications due to influenza can also occur in persons with chronic health conditions such as heart disease, diabetes, or HIV. Recently, human infections and deaths from bird flu (influenza A H5N1) reported worldwide since 2003 have generated great concern for this or another strain's potential for a pandemic.

Data from sentinel providers are critical for monitoring the impact of influenza. In combination with other influenza surveillance data, they can be used to guide prevention and control activities, vaccine strain selection, and patient care. Sentinel providers receive feedback on the data submitted, summaries of Florida and national influenza data, a free subscription to CDC's Morbidity and Mortality Weekly Report (valued at $150.00) and the Emerging Infectious Diseases Journal. Most importantly, the data provided are critical for protecting the public's health.

For more information, please contact **Erin O'Connell** at 305-470-5660.

About the Epi Monthly Report

The Epi Monthly Report is a publication of the Miami-Dade County Health Department, Office of Epidemiology and Disease Control, The publication serves a primary audience of physicians, nurses, and public health professionals. Articles published in the Epi Monthly Report may focus on quantitative research and analysis, program updates, field investigations, or provider education. For more information or to submit an article, contact Diana Rodriguez, Managing Editor, or Rodlescia Sneed at 305-470-5660.

Monthly Report
Selected Reportable Diseases/Conditions in Miami-Dade County, October 2006

Diseases/Conditions	2006 this Month	2006 Year to Date	2005 Year to Date	2004 Year to Date	2003 Year to Date	2002 Year to Date
AIDS *Provisional	75	987	1060	1156	856	915
Animal Rabies	0	0	0	0	0	0
Campylobacteriosis	5	143	115	112	115	82
Chlamydia trachomatis	572	4190	3217	3946	3738	4072
Ciguatera Poisoning	0	0	0	0	0	2
Cryptosporidiosis	5	27	27	16	11	8
Cyclosporosis	0	0	11	2	1	1
Dengue Fever	1	2	3	4	1	3
Diphtheria	0	0	0	0	0	0
E. coli, O157:H7	0	1	0	3	0	0
E. coli, Non-O157	0	0	1	1	2	1
E. coli, Other	0	0	0	0	0	0
Encephalitis (except WNV)	0	0	0	1	0	1
Encephalitis, West Nile Virus	0	0	0	15	6	2
West Nile Fever	0	0	0	6	0	0
Giardiasis, Acute	17	182	185	245	154	173
Gonorrhea	172	1600	1346	1478	1573	1730
Hepatitis A	6	43	54	37	52	130
Hepatitis B	2	22	39	28	47	38
HIV *Provisional	90	1014	1166	1430	1395	1605
Lead Poisoning	9	125	146	264	215	250
Legionnaire's Disease	2	9	6	7	5	1
Leptospirosis	0	0	2	0	0	0
Lyme disease	0	0	0	3	4	2
Malaria	0	14	8	16	12	10
Measles	0	0	0	1	0	0
Meningitis (except aseptic)	0	12	11	10	7	5
Meningococcal Disease	0	12	6	18	4	12
Mumps	0	0	0	0	0	0
Pertussis	0	5	9	9	9	6
Polio	0	0	0	0	0	0
Rubella	0	0	0	0	0	0
Rubella, Congenital	0	0	0	0	0	0
Salmonellosis	78	478	469	370	443	258
Shigellosis	20	117	223	137	263	207
Streptococcus pneumoniae, Drug Resistant	4	87	56	58	109	93
Syphilis, Infectious	13	179	137	183	158	179
Syphilis, Other	115	861	474	697	866	918
Tetanus	0	0	0	0	0	0
Toxoplasmosis	0	0	9	7	9	15
Tuberculosis *Provisional	11	154	165	196	173	191
Typhoid Fever	0	6	2	3	4	3
Vibrio cholera Type O1	0	0	0	0	0	0
Vibrio cholera Non-O1	0	0	0	0	0	1
Vibrio, Other	0	0	0	0	1	0

* Data on AIDS are provisional at the county level and are subject to edit checks by state and federal agencies.
** Data on tuberculosis are provisional at the county level.