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Increase in Reported Acute Hepatitis C Virus (HCV) Infections in Indiana

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Reported acute HCV cases in Indiana have significantly increased during the first five weeks of the 2011 reporting year. The Indiana State Department of Health (ISDH) first identified this trend on February 8th when the sixth acute HCV case was reported. Upon review of the six acute HCV cases, three cases resided in one county (County A) with the other three cases not residing in close proximity to this county or each other. The ISDH notified the local health department (LHD) in County A to discuss the surveillance and investigation of the three cases and their contacts.

In the following two weeks, four additional cases were reported to the ISDH, totaling 10 acute HCV cases occurring in the first five weeks of 2011. There appeared to be two clusters with the potential for a third. Based on past reporting years, it takes approximately 20 – 25 weeks before 10 acute HCV cases are reported to the ISDH in a reporting year. The ISDH Epidemiology Resource Center (ERC), HIV/STD Program, and Laboratories developed a plan to further investigate these clusters and prevent further transmission. The ISDH ERC has notified the Centers for Disease Control and Prevention (CDC) of the increase in acute HCV cases and will be consulted for further guidance.

There are several commonalities among the cases within each cluster. The three acute cases in County A are males age 21-30 years and presented with symptoms to emergency departments within 11 days of each other. Additionally, two cases reported contact with known HCV cases, two cases reported being incarcerated at the same county jail during the same time, and two cases reported injection drug use (IDU). In the second cluster (County B), three female cases presented with symptoms to emergency departments within three weeks of each other. Additionally, two cases reported contact with known HCV cases, two cases reported IDU, two cases reported non-injection drug use (NIDU), and two cases reported multiple sex partners.

None of the 10 reported acute HCV cases indicated close contact with one another. The absence of close contact exposure data has been identified as a problem in determining

linkage, or the absence of linkage, among these acute HCV cases. Exposure data is not consistently investigated and submitted to the ISDH. To better understand the epidemiology of HCV infections in Indiana, the ISDH is asking that all local health departments submit first and last names, date of birth/age, address/phone number, and type of contact (household, social, sexual, drug use, etc.) for contacts of acute HCV case who are suspected/known to have a HCV infection and for contacts who may have been exposed to an acute HCV case's blood. At-risk contacts should be interviewed for symptoms, encouraged to be tested for HCV, informed of their HCV test status, and provided education regarding the transmission and prevention of HCV infections. This information should be included in the comment section of the HCV case investigation form (State Form 52588) during this critical period of increased HCV transmission. This form is available at http://www.in.gov/isdh/19042.htm under Hepatitis C Case Investigation. Current users of the electronic reporting system (I-NEDSS) should continue using the form provided and place the information in the comments section.

The case definitions for acute and chronic HCV infections are located at http://www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis2011.htm. Both case definitions were recently revised. The 2011 acute HCV case definition states that an acute case of HCV infection must have the following: the discreet onset of symptoms with the presence of jaundice, dark urine, or an alanine aminotransferase (ALT) level of >400 IU/L. There must be a positive confirmatory test or a positive screening test with a signal-to-cut-off ratio (s/c ratio) above the upper limit for that particular assay. Furthermore, there must be negative IgM antibody tests for hepatitis A virus and hepatitis B core antigen to rule out hepatitis A and hepatitis B infections. All laboratory data should be forwarded to the ISDH. (The chronic case definition title was changed to include past and present infections as was done prior to the 2010 case definition.) The 10 acute HCV cases occurring in the first five weeks of 2011 would have met the old case definition for an acute case. Therefore, the change in the acute HCV case definition has not contributed to the increase in reported acute HCV cases.

The number of HCV laboratory reports and Confidential Reports of Communicable Diseases (CDRs) received by the ISDH has not played a role in the 2011 increase of reported acute HCV cases. The Hepatitis C Epidemiologist received 4,112 reports for the period of December 2010 –
January 2011, compared to 4,370 reports for December 2009 – January 2010 and 4,200 reports for December 2008 – January 2009.

The effect of electronic disease reporting is not clearly understood. With the movement toward electronic communicable disease reporting in Indiana, positive reports are assigned to the local health departments sooner than with the paper process. As a result, the LHDs have the ability to conduct surveillance and investigation of HCV cases sooner in the disease process. The electronic reporting process became available in 2008, but 2009 was the first full reporting year. Twenty-two acute HCV cases were reported in 2009, and 26 acute HCV cases were reported in 2010 (the data for 2010 are provisional). According to 2011 surveillance data, it appears increased transmission of HCV is occurring in Indiana. Please contact Sara Sczesny at 317-234-2827 or ssczesny@isdh.in.gov for questions or guidance. Information on HCV cases may be faxed to 317-234-2812 to the attention of Sara Sczesny or submitted via I-NEDSS.

Ever-Evolving Enterobacteriaceae

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Enterobacteriaceae are gram negative, non- sporeforming bacilli. This group includes organisms like *Citrobacter*, *Enterobacter*, *Escherichia coli* (*E.coli*), *Klebsiella*, *Morganella*, *Proteus*, *Providencia*, *Serratia*, *Salmonella*, *Shigella*, and *Yersinia*. Most of these organisms cause clinically significant infections of which *E.coli* and *Klebsiella* are commonly associated with healthcare acquired infections (HAI).

Multiple resistance mechanisms can present in these organisms simultaneously. These mechanisms are due to excessive production of plasmid derived AmpC beta-lactamase or plasmid mediated extended-spectrum beta lactamases (ESBL). These ESBL producing organisms, mostly seen in *E. coli* and *Klebsiella* species, are typically resistant to penicillins, cephalosporins, and monobactams, sometimes to aminoglycosides. Recently, resistance has been seen to the most potent available class of β-lactam antibiotics, the carbapenems, (Doripenem, Imipenem, Meropenem and Ertapenem).

Carbapenem-resistant *Enterobacteriaceae* (CRE), mainly *E. coli* and *Klebsiella* species, are an emerging, important health care challenge, resistant to almost all currently available antibiotics. Currently, carbapenem-resistant *Klebsiella pneumoniae* (CRKP) is the most common CRE species in the United States. CRE infections include pneumonia, wound or surgical site infections, bloodstream infections, and meningitis. The mechanism of resistance for CRKP is production of carbapenamase enzyme known as *bla*kpc or KPC. The newly found mechanisms were production of New Delhi metallo-beta-lactamase (NDM-1) likewise, newer mechanisms have been found all around the world in different *Enterobacteriaceae* species.

Health care providers should be concerned about CRKP infections, as they are associated with high rates of morbidity and mortality, treatment challenges, increased length of hospital stay, and increased cost. CRKP is seen among patients who are critically ill, have prolonged hospitalizations, and are treated with invasive devices. Outbreaks have been seen in long- term, acute- care hospitals (LTACH) and long term care facilities (LTC) in the US.
Due to the threats and challenges posed by these emerging organisms, strict infection prevention and control measures are necessary to manage and limit further emergence of resistant organisms. CDC and Healthcare Infection Control Practices Advisory Committee (HICPAC) guidance can be found at http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5810a4.htm and in the table below.

The Communicable Disease Reporting Rule, 410 IAC 1-2.3, requires the reporting of diseases caused by drug-resistant organisms and emerging infectious diseases (410 IAC 1-2.3-49 (2)(f)(2). Please contact Jean Svendsen, 317-233-7825, for questions or additional information.

Infection prevention and control guidance for carbapenem-resistant *Enterobacteriaceae* (or carbapenemase-producing *Enterobacteriaceae*) in acute care facilities — CDC and the Healthcare Infection Control Practices Advisory Committee

Infection Prevention and Control

- All acute care facilities should implement contact precautions for patients colonized or infected with carbapenem-resistant *Enterobacteriaceae* (CRE) or carbapenemase-producing *Enterobacteriaceae*. No recommendation can be made regarding when to discontinue contact precautions.

Laboratory

- Clinical microbiology laboratories should follow Clinical and Laboratory Standards Institute guidelines for susceptibility testing (*1*) and establish a protocol for detection of carbapenemase production (e.g., performance of the modified Hodge test).
- Clinical microbiology laboratories should establish systems to ensure prompt notification of infection prevention staff of all *Enterobacteriaceae* isolates that are nonsusceptible to carbapenems or *Klebsiella* spp. or *Escherichia coli* isolates that test positive for a carbapenemase.

Surveillance

- All acute care facilities should review clinical culture results for the preceding 6–12 months to determine whether previously unrecognized CRE have been present in the facility.
  - If this review identifies previously unrecognized CRE, a point prevalence survey (a single round of active surveillance cultures) should be performed to look for CRE in high-risk units (e.g., intensive care units, units where previous cases have been identified, and units where many patients are exposed to broad-spectrum antimicrobials).
  - If this review does not identify previously unrecognized CRE, monitoring for clinical infections should be continued.
- If CRE or carbapenemase-producing *Klebsiella* spp. or *E. coli* are detected from one or more clinical cultures **OR** if the point prevalence survey reveals unrecognized colonization, the facility should investigate for possible transmission by:
  - Conducting active surveillance testing of patients with epidemiologic links to a patient with CRE infection (e.g., patients in the same unit or who have been cared for by the same health-care personnel).
    - Continue active surveillance periodically (e.g., weekly) until no new cases of colonization or infection suggesting cross-transmission are identified.
    - If transmission of CRE is not identified after repeated active surveillance testing, consider altering the surveillance strategy by performing periodic point prevalence surveys in high-risk units.
  - In areas where CRE are endemic, an increased likelihood exists for importation of CRE, and the procedures outlined might not be sufficient to prevent transmission. Facilities in such areas should monitor clinical cases and consider additional strategies to reduce rates of CRE as described in the 2006 Tier 2 guidelines for management of multidrug-resistant organisms in health-care settings (*2*). Recommendations for rate calculations have been described previously (*3*).

References

1. Clinical and Laboratory Standards Institute. 2009 performance standards for antimicrobial susceptibility testing. Nineteenth information supplement (M100-S19). Wayne, PA: Clinical and Laboratory Standards Institute; 2009.
2. CDC, Healthcare Infection Control Practices Advisory Committee. Management of multidrug-resistant organisms in healthcare settings, 2006. Atlanta, GA: US Department of Health and Human Services, CDC, Healthcare Infection Control Practices Advisory Committee; 2007. Available at http://www.cdc.gov/ncidod/dhqp/pdf/ar/mdroguideline2006.pdf.
3. Cohen AL, Calfee D, Fridkin SK, et al. Recommendations for metrics for multidrug-resistant organisms in healthcare settings: SHEA/HICPAC position paper. Infect Control Hosp Epidemiol 2008;29:901–13.

Additional *CRE* Resources

1. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5810a4.htm
2. http://www.cdc.gov/ncidod/dhqp/ar_kp.html?zbrandid=3032&zidType=CH&zid=1693961&zsubscriberId=751517065
3. http://www.infectioncontroltoday.com/news/2010/10/survey-shows-rise-in-new-antibiotic-resistantbacteria-in-chicago-area.aspx
4. http://www.infectiousdiseasenews.com/print.aspx?id=70587
5. http://www.bio-medicine.org/biology-news-1/Press-statement-on-new-CDC-MMWR-on-Klebseillapneumonia-Carbapenemase-producing-organisms-7568-1/
6. http://www.medscape.com/viewarticle/713709?src=mp&spon=24&uac=96567PY
7. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5937a4.htm?s_cid=mm5937a4_w

8. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5924a5.htm?s_cid=mm5924a5_w
9. http://www.cdc.gov/mmwr/pdf/wk/mm59e0921.pdf
10. CDC, Healthcare Infection Control Practices Advisory Committee. Management of multidrug-resistant organisms in healthcare settings, 2006. Atlanta, GA: US Department of Health and Human Services, CDC, Healthcare Infection Control Practices Advisory Committee; 2007. Available at http://www.cdc.gov/ncidod/dhqp/pdf/ar/mdroguideline2006.pdf.
11. Clinical and Laboratory Standards Institute. 2009 performance standards for antimicrobial susceptibility testing. Nineteenth information supplement (M100-S19). Wayne, PA: Clinical and Laboratory Standards Institute; 2009.

Training Room

INDIANA STATE DEPARTMENT OF HEALTH IMMUNIZATION PROGRAM PRESENTS:

Immunizations from A to Z

Immunization Health Educators offer this FREE, one-day educational course that includes:

- Principles of Vaccination
- Childhood and Adolescent Vaccine-Preventable Diseases
- Adult Immunizations
    - Pandemic Influenza
- General Recommendations on Immunization
    - Timing and Spacing
    - Indiana Immunization Requirements
    - Administration Recommendations
    - Contraindications and Precautions to Vaccination
- Safe and Effective Vaccine Administration
- Vaccine Storage and Handling
- Vaccine Misconceptions
- Reliable Resources

This course is designed for all immunization providers and staff. Training manual, materials, and certificate of attendance are provided to all attendees. Please see the Training Calendar for presentations throughout Indiana. Registration is required. To attend, schedule/host a course in your area or for more information, please reference http://www.in.gov/isdh/17193.htm.

ISDH Data Reports Available

The following data reports and the *Indiana Epidemiology Newsletter* are available on the ISDH Web Page:

http://www.IN.gov/isdh/

HIV/STD Spotlight Reports (June 2007, December 2007, June 2008, January 2009)	Indiana Mortality Report (1999-2007)
Indiana Cancer Report: Incidence; Mortality; Facts & Figures	Indiana Infant Mortality Report (1999, 2002, 1990-2003)
Indiana Health Behavior Risk Factors (1999-2008)	Indiana Natality Report (1998-2007)
Indiana Health Behavior Risk Factors (BRFSS) Newsletter (2003-2010)	Indiana Induced Termination of Pregnancy Report (1998-2007)
Indiana Hospital Consumer Guide (1996)	Indiana Marriage Report (1995, 1997, & 2000-2004)
Public Hospital Discharge Data (1999-2008)	Indiana Infectious Disease Report (1997-2009)
Assessment of Statewide Health Needs – 2007	Indiana Maternal & Child Health Outcomes & Performance Measures (1989-1998, 1990-1999, 1991-2000, 1992-2001, 1993-2002, 1994-2003, 1995-2004, 1996-2005)

HIV Disease Summary

Information as of December 31, 2010 **based on 2000 population of 6,080,485)**

HIV - without AIDS to date:

333	New HIV cases January 2010 thru December 31, 2010	12-month incidence	5.48 cases/100,000
4,449	Total HIV-positive, alive and without AIDS on December 31, 2010	Point prevalence	73.17 cases/100,000

AIDS cases to date:

315	New AIDS cases from January 2010 thru December 31, 2010	12-month incidence	5.18 cases/100,000
5,359	Total AIDS cases, alive on December 31, 2010	Point prevalence	88.13 cases/100,000
11,101	Total AIDS cases, cumulative (alive and dead) on December 31, 2010		

REPORTED CASES of selected notifiable diseases

Disease	Cases Reported in November - December *MMWR* Weeks 44-52		Cases Reported in January - December *MMWR* Weeks 1-52	
	2009	2010	2009	2010
Campylobacteriosis	76	73	620	740
Chlamydia	2566	3696	17653	20115
Cryptococcus	8	4	32	25
Cryptosporidiosis	39	29	278	281
E. coli, shiga toxin-producing	9	7	64	57
Giardiasis	64	52	313	390
Gonorrhea	672	1057	5411	5672
Haemophilus influenzae, invasive	20	25	86	110
Hemolytic Uremic Syndrome (HUS)	1	0	7	7
Hepatitis A	1	1	18	12
Hepatitis B	12	9	75	72
Hepatitis C acute	6	3	22	26
Histoplasmosis	27	29	135	122
Influenza deaths (all ages)	20	1	37	4
Legionellosis	8	2	64	55
Listeriosis	2	1	10	15
Lyme Disease	3	0	62	63
Measles	0	0	0	0
Meningococcal, invasive	3	8	31	29
Mumps	0	0	2	4
Pertussis	78	145	392	743
Rocky Mountain Spotted Fever	0	0	1	1
Salmonellosis	93	100	572	749
Shigellosis	18	12	75	66

REPORTED CASES of selected notifiable diseases

Disease	Cases Reported in November - December *MMWR* Weeks 44-52		Cases Reported in January - December *MMWR* Weeks 1-52	
	2009	2010	2009	2010
Severe *Staphylococcous aureus* in a previously healthy person	2	3	17	26
Group A Streptococcus, invasive	20	25	167	127
Group B, Streptococcus, Invasive (all ages)	53	49	306	298
Streptococcus pneumoniae (invasive, all ages)	153	155	567	692
Streptococcus pneumoniae (invasive, drug resistant)	47	38	251	213
Streptococcus pneumoniae (invasive, <5 years of age)	12	7	54	50
Syphilis (primary and secondary)	16	22	113	178
Tuberculosis	26	25	119	90
Vibriosis	0	0	3	6
Varicella	37	20	102	180
Yersiniosis	1	5	8	13
Animal Rabies	1 (Bat)	0	39 (Bats)	24 (Bats)

For information on reporting of communicable diseases in Indiana, call the *Surveillance and Investigation Division* at 317.233.7125.

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Cover photo of Cryo-EM reconstruction of a norovirus capsid.courtesy of Dr. B.V.V. Prasad, Baylor College of Medicine, Houston, TX 77030

The *Indiana Epidemiology Newsletter* is published bi-monthly by the Indiana State Department of Health to provide epidemiologic information to Indiana health care professionals, public health officials, and communities.