

Submission Type ID	Breakout/Quick/Lightning/Poster
Abstract Type	Breakout
Abstract Title	An Epidemiologic Profile of Acute and Chronic Hepatitis C Infection and Hepatitis C-Associated Mortality in Saint Louis County, MO

Abstract

BACKGROUND: To better understand the transmission of hepatitis C virus (HCV), the burden of chronic HCV infection, and trends in HCV-associated mortality in Saint Louis County, MO, the Saint Louis County Department of Public Health (DPH) created an epidemiologic profile for HCV infection.

METHODS: We analyzed acute and chronic HCV cases diagnosed among Saint Louis County residents between 2013 and 2017 and HCV-related deaths from 2010 to 2016. In 2016, DPH began investigating reports of HCV infection among people aged 30 years and younger, or reports including evidence of acute infection (e.g., jaundice), to assess behavioral risk factors and classify cases as acute or chronic. We calculated rates per 100,000 population by sub-county region, age group, sex, race, ethnicity, and census tract poverty level. We adjusted mortality rates to the 2000 U.S. population.

RESULTS: In 2017, the acute HCV incidence rate in Saint Louis County was 1.9 cases per 100,000 population, higher than the most recently reported state and national rates. The rate of newly reported chronic HCV infection was 60.2 cases per 100,000 population—a decline of 4.7% from 2016 and a 34.6% decline from the five-year high in 2015. The age-adjusted HCV mortality rate from 2010 to 2016 was 1.4 deaths per 100,000 population. Acute and chronic HCV rates and HCV-associated mortality rates are highest in regions of the county with lower socioeconomic status. For both acute and chronic HCV cases where risk factor data was reported, approximately 75% reported injection drug use. Rates of acute and chronic HCV have increased among younger populations since 2013 and remain higher among men than women. In 2017, black residents had acute and chronic HCV rates 1.5 times and 3.4 times those of whites, respectively. HCV-associated mortality remains highest among persons aged 55 years and older.

CONCLUSIONS: The burden of HCV infection and HCV-related mortality falls disproportionately on Saint Louis County's black residents, men, and people living in very poor census tracts, especially in the county's Inner North region. Acute HCV incidence in Saint Louis County is high, and our reported incidence likely underestimates true incidence due to asymptomatic infections, under-testing, and under-reporting. Surveillance bias inherent to our acute HCV case finding methods may especially underestimate acute HCV incidence in people aged 30 years and older, and an apparent increase in acute infection is likely driven both by a true incidence in transmission related to injection drug use and by increased case finding activity.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Infectious Diseases; Hepatitis; Epidemiology
Consider for Different Presentation?	Yes
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Submission Type ID	Breakout/Quick/Lightning/Poster
Abstract Type	Breakout
Abstract Title	Community Outbreak of Hepatitis B, Washington State, 2018

Abstract

BACKGROUND: In August 2018, Spokane Regional Health District (SRHD) observed an increase in cases of acute hepatitis B. Acute hepatitis B outbreaks are rare in Washington State (WA). The WA Department of Health (DOH) was invited to assist with the investigation, including risk factor identification and transmission control.

METHODS: All acute hepatitis B cases with onset dates after December 31, 2017 that spent time in Eastern Washington or the Idaho Panhandle during their exposure period were included. Case investigation included interviews, medical record review, and review of local syringe exchange program use. Contact tracing was performed through interviews, Facebook, jail follow-up, and review of existing sexually transmitted infection program records. When available, case serum specimens were sent to the Centers for Disease Control and Prevention for whole genome sequencing (WGS). SRHD partnered with community organizations to provide outreach and TWINRIX vaccine to adults who inject drugs, have sexual risk, and/or are experiencing homelessness. Text message reminders for subsequent doses and a social media campaign augmented the vaccination effort.

RESULTS: As of December 19, 2018, 14 cases meeting the confirmed outbreak case definition were identified; onset dates ranged from February to September 2018. Nine cases were male, and the median age [range] was 35 [18-67] years. Based on interviews, medical record review, and review of local syringe exchange program use, the following risk factors during the exposure period were identified for persons with information available: 7/14 injection drug use (IDU); 5/12 sexual risk; 4/12 potential healthcare exposures; and 4/11 incarceration. Two cases had both sexual risk and IDU. Two cases with IDU also experienced homelessness. No linkages were identified between potential healthcare exposure sites. WGS of four cases indicated that two specimens had $\leq 0.22\%$ nucleotide variation; a third specimen was closely related. The only identified common risk factor between these three cases was IDU. A fourth case was unrelated by WGS and denied IDU. A total of 193 first doses and 63 second doses of TWINRIX have been administered; 17 persons have received a complete vaccine series.

CONCLUSIONS: This investigation is ongoing. Behavioral risk factors – IDU or sexual risk – were identified in 10 of 14 cases. This investigation highlights the value of combined epidemiological investigation with WGS of hepatitis B virus. Based on this investigation, a targeted vaccination strategy was implemented through collaboration with community partners, use of reminder recall text messages, and educational outreach through social media.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Outbreaks; Risk Factors; Hepatitis
Consider for Different Presentation?	Yes
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Submission Type ID	Breakout/Quick/Lightning/Poster
Abstract Type	Lightning
Abstract Title	Access to Hepatitis C Treatment Providers in Wisconsin Following a Change in State Medicaid Policy

Abstract

BACKGROUND: Rates of hepatitis C virus (HCV) infection have increased in Wisconsin, particularly in rural areas. Treatment with direct-acting antivirals (DAAs) can cure HCV. However, because of their high cost, many state Medicaid programs have restricted which providers can prescribe and which patients can receive DAAs. On July 1, 2017, Wisconsin Medicaid removed restrictions requiring that DAAs be prescribed by specialists in infectious disease or gastroenterology. As a project for the federally-organized HCV/Medicaid Affinity Group, we evaluated whether the number of DAA providers, particularly non-specialists, increased during the 12 months after the policy change. Additionally, we evaluated whether access to DAA providers varied in rural compared to urban areas of Wisconsin.

METHODS: Wisconsin Medicaid prescription claims data were searched to identify the names, medical specialties, and clinic addresses of providers who submitted claims for DAA prescriptions during the 12 months before (Time₁: July 1, 2016-June 30, 2017) and/or the 12 months after (Time₂: July 1, 2017-June 30, 2018) the policy change. We compared the number of providers, by specialty, during Time₁ and Time₂. Additionally, we compared provider locations to HCV prevalence data reported to the Wisconsin Division of Public Health as of 2017. We used ArcGIS to calculate the driving time between the residence address of each prevalent HCV case and the address of the closest provider. Percentages of cases residing within 30 minutes of a provider were calculated and stratified by whether the case resided in a rural or urban zip code.

RESULTS: From Time₁ to Time₂, the number of DAA providers increased by 48% (from 120 to 178). Among the 58 additional providers, 50 (86%) were specialists and 8 (14%) were non-specialists, including 4 family medicine physicians and 3 internal medicine physicians. Specialists accounted for the majority of providers during Time₁ (96%) and Time₂ (93%). The percentage of prevalent HCV cases residing within 30 minutes driving time of a provider was similar during Time₁ (77%) and Time₂ (81%). During Time₂, only 34% of rural cases resided within 30 minutes of a provider compared to 96% of urban cases ($p < 0.001$).

CONCLUSIONS: During the 12 months after the policy change, few non-specialists prescribed DAAs. Additionally, HCV cases residing in rural areas had less access to DAA providers than cases residing in urban areas. Expansion of DAA prescribing to non-specialists may require provider education regarding HCV treatment and current Medicaid policy as well as identification of any institutional barriers.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Hepatitis; Geographic Information Systems (GIS)
Consider for Different Presentation?	Yes
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Submission Type ID	Breakout/Quick/Lightning/Poster
Abstract Type	Lightning
Abstract Title	Hepatitis A Vaccination Among Health Department STD Clients during a HAV Outbreak: Need and Uptake - Tennessee, 2018

Abstract

BACKGROUND: Tennessee (TN) is experiencing a hepatitis A virus (HAV) outbreak among people who use recreational drugs, people experiencing homelessness, and men who have sex with men. Vaccination is a cornerstone of HAV prevention. As part of its outbreak response, the TN Department of Health (TDH) identified venues serving at-risk populations, including health department (HD) Sexually Transmitted Disease (STD) clinics. HAV vaccination was provided to these STD clinics in an effort to provide routine opt-out vaccine to all incompletely or un-vaccinated clients. We sought to quantify the potential and actual impact of this approach.

METHODS: The TDH Viral Hepatitis program produces a monthly HAV vaccination report among STD clients (most recent study period in November 2018), stratified by public health region as follows: a list of HD clients seeking STD services was extracted from the clinic management information system and de-duplicated by region. Identifying information (first name, last name, DOB, and social security number, as available), was matched to the TN Immunization Information System (TennIIS) to determine the HAV vaccination status of STD clients at the time of the visit: “complete”; “up-to-date” (the first dose was administered within 6 months prior to the month of the STD visit); or “in-need” (previously unvaccinated or received one dose more than six months prior). For clients “in need” of vaccination, TennIIS was checked to determine if HAV vaccination was administered at the current visit.

RESULTS: In the most recent study period, 9,564 HD clinic clients sought STD services in TN. Of these, 20.5% (n=1,956) had previously “completed” their HAV vaccination series, 4.7% (n=447) were “up-to-date”, and 74.9% (n=7,161) were “in-need” of HAV vaccine. Of clients “in-need”, 17.0% (n=1,216) were vaccinated during the current visit (ranging from 0 - 38.5% across all regions).

CONCLUSIONS: STD clinics provide an important opportunity to access a high number of at-risk adults in need of HAV vaccination. Despite implementation of a routine opt-out strategy, uptake was low. In order to maximize the uptake of HAV vaccine to at-risk adults in an outbreak context, it is imperative that each local HD identify and address barriers to vaccination uptake among their STD clients “in-need” of vaccination.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Sexually Transmitted Diseases; Vaccine-Preventable Diseases; Hepatitis
Consider for Different Presentation?	Yes
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Submission Type ID	Breakout/Quick/Lightning/Poster
Abstract Type	11379
Abstract Title	Lightning
Abstract Title	Hepatitis C Virus Infection Among Women of Reproductive Age As a Primary Prevention Measure for Neonatal Abstinence Syndrome Infants; Tennessee, 2016

Abstract

BACKGROUND: Tennessee (TN) is home to one of the highest opioid prescribing and hepatitis C virus (HCV) infection rates in the nation and rates are on the rise. Driven by the opioid epidemic, the highest rates of HCV are among people who inject drugs and specifically among people less than 30 years of age, white, and living in rural areas. Given overlapping consequences of the opioid epidemic, we sought to determine the co-occurrence of infants diagnosed with Neonatal Abstinence Syndrome (NAS) and mothers with history of HCV infection.

METHODS: Birth certificate data from 2016 were obtained from the TN Department of Health Birth Statistical File. Maternal information was matched with HCV laboratory data available in the TN NEDSS Based System (NBS) to ascertain maternal HCV history. Mothers were considered to have a history of HCV if maternal HCV infection was denoted on the birth certificate, or if NBS records contained a positive HCV antibody or RNA test result prior to two weeks postpartum. A cohort of infants born in 2016 with an NAS diagnosis was derived from 2016 final and 2017 provisional inpatient and outpatient hospital discharge data using ICD-10 code P96.1 (neonatal withdrawal symptoms from maternal use of drugs of addiction). NAS cases were linked to the maternal HCV surveillance dataset and all analyses were completed using SAS 9.4.

RESULTS: There were 80,755 TN live births in 2016; 1,614 of these infants were born to a mother with a history of HCV infection (20.0 per 1,000 live births) and 1,227 had an NAS diagnosis within one year of birth (15.2 per 1,000 live births). Of infants diagnosed with NAS, 435 (35.5%) were born to a mother with a history of HCV (5.4 per 1,000 live births). The preponderance of these infants resided in Eastern TN (73.8%) and were born to Non-Hispanic white mothers (96.5%), aged 18 to 29 years (65.5%).

CONCLUSIONS: This analysis illustrates a significant overlap between maternal HCV history and subsequent NAS diagnosis of her infant, suggesting that HCV testing among women of childbearing age may serve as a proxy for maternal opioid use and *in-utero* opioid exposure. Therefore, the benefits of HCV testing among women of childbearing age may include linking HCV-positive women to treatment for HCV, as well as to opioid use disorder services.

Submission Complete?	Yes
Committee Topic	Infectious Disease
Keywords	Hepatitis
Consider for Different Presentation?	Hepatitis; Maternal and Child Health; Surveillance
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Submission Type ID	Breakout/Quick/Lightning/Poster
Abstract Type	Lightning
Abstract Title	Hepatitis C Virus Seroconversion Among Health Department Clients: Tennessee, 2016-2018

Abstract

BACKGROUND: In 2016, the TN Department of Health (TDH) piloted hepatitis C virus (HCV) testing in three health departments (HDs) in Eastern Tennessee, with subsequent statewide HD scale-up in 2017. Testing was routine opt-out for STD patients and risk factor (RF) based for others. Risk factors were assessed for all clients tested. Repeat testing was permitted for patients with ongoing RFs. TDH's Public Health Laboratory (PHL) processed all specimens collected in HDs. We sought to quantify the number of HCV seroconversions detected among patients undergoing testing in HDs in TN.

METHODS: Results from HCV testing conducted at TDH's PHL among HD clients tested from June 1, 2016 to December 10, 2018 were aggregated and analyzed using SAS 9.4. Data were matched on a locally defined variable, XID (client last name, client first name, and client DOB) and subsequently sorted by XID, testing date, and test result. Clients with only one test result or with an initial positive Ab were excluded; remaining clients were then examined to determine if they met our definition of HCV seroconversion (initial negative HCV Ab test result followed by a positive HCV Ab result), as well as the elapsed time period between the two tests.

RESULTS: During the evaluation period, 4,575 people within our cohort had 2 or more HCV Ab tests conducted at different points in time, with 1.6% (n=74) seroconverting. Additionally, 3,033 people had at least 2 tests occurring within 12 months, with 1.6% (n=48) seroconverting and meeting CSTE's definition of confirmed acute HCV infection. Of clients with confirmed acute HCV, 60.4% (n=29) were tested in Eastern TN; 58.3% (n=28) were female; 75.0% (n=36) were white; and the median age at seroconversion was 27 years (17-61). Reported RFs changed from the time of first negative to first positive Ab test: 45.5% to 57.8% for history of injection drug use, 40.9% to 51.1% for non-professional tattoo, 52.3% to 62.2% for incarceration, and 57.8% to 62.2% for intranasal drug use.

CONCLUSIONS: Our findings demonstrate the importance of repeat HCV testing among clients with RFs and the utility of capturing HCV Ab negative test results for the detection of acute HCV cases that would otherwise go unreported. These 48 cases represent about one-third of currently reported confirmed acute HCV cases in TN each year. The identification of additional acute HCV cases provides valuable opportunities for case investigation, partner services, and linkage to prevention and treatment services.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Hepatitis; Infectious Diseases; Health Care
Consider for Different Presentation?	Yes
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Submission Type ID	Breakout/Quick/Lightning/Poster
Abstract Type	Lightning
Abstract Title	Increase in Hepatitis C Testing at Facilities Serving High Risk Clients in Allegheny County, PA

Abstract

BACKGROUND: Hepatitis C is a liver disease caused by infection with the bloodborne hepatitis C virus (HCV). Allegheny County launched an HCV elimination initiative in 2018, with increasing testing and linkage to care and treatment as primary goals. To assess access to HCV testing and better understand testing barriers in Allegheny County, the Allegheny County Health Department (ACHD) conducts sentinel surveillance of HCV testing at community organizations serving individuals at high risk for HCV infection.

METHODS: Facilities participating in the sentinel surveillance system include federally qualified and neighborhood health centers, organizations providing HIV services, drug and alcohol treatment facilities, homeless service programs, corrections, and syringe service programs. The ACHD annual survey captures data on the number of 1) HCV screening tests completed, 2) the number of positive HCV screening tests, 3) the number of HCV confirmatory tests completed, 4) the number of positive confirmatory tests, 5) the number of referrals to care, and 6) the number of clients treated. Data are analyzed in Excel and Epi Info.

RESULTS: Of 82 organizations contacted, 78 (95%) provided HCV testing data for both 2016 and 2017. In 2016, 9 (12%) facilities reported conducting HCV screening compared to 21 (27%) in 2017. Between 2016 and 2017, the volume of HCV screening tests increased (2,502 in 2016 vs. 15,447 in 2017), but the percent positive remained similar (14% in 2016 vs 13% in 2017). In 2016, 6 (8%) facilities offered confirmatory testing for individuals with positive HCV screening tests while 8 (10%) facilities offered confirmatory testing in 2017. Between 2016 and 2017, the volume of confirmatory tests increased (149 in 2016 vs 1,993 in 2017); the positivity also increased (60% in 2016 vs 66% in 2017). Lack of resources and the inability to bill for services were reportedly the main barriers to HCV testing.

CONCLUSIONS: The number of facilities conducting any HCV testing increased between 2016 and 2017, but the total number of facilities screening remained low. Many facilities serving clients at high risk for HCV infection do not currently offer HCV testing. To reduce the burden of HCV and its sequelae, health department staff must work with key partners to increase testing of persons at risk and ensure that individuals with active infection are linked to care and treatment. Sentinel surveillance is useful for monitoring progress towards HCV elimination and identifying organizations in need of testing services.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Hepatitis; Infectious Diseases; Surveillance
Consider for Different Presentation?	Yes
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Submission Type	Breakout/Quick/Lightning/Poster
ID	11152
Abstract Type	Lightning
Abstract Title	Increasing Completeness and Timeliness of Reporting in an Acute Hepatitis A Outbreak

Abstract

BACKGROUND: Prior to 2017, the incidence of acute hepatitis A (HAV) in Kentucky was at or near the national average annually: the majority of cases were associated with travel to endemic areas. An HAV outbreak was declared in November 2017, when Kentucky saw a sharp increase in the number of HAV cases not associated with travel. Kentucky requires that cases of acute HAV be reported within 24 hours (902 KAR 2:020). Prompt reporting allows public health to implement control measures more effectively, such as removal from high-risk occupations and administration of post-exposure prophylaxis (PEP) to close contacts. Due to the historically low incidence, local health department (LHD) staff were unaccustomed with the investigation and reporting process for acute HAV infections, resulting in delayed reporting and decreased opportunities to prevent further transmission.

METHODS: Reportable disease staff at KDPH worked to develop guidance documents for distribution to LHD staff, which were shared electronically and placed on KDPH's website. As delays in reporting HAV cases continued, individual emails and phone calls to jurisdictions were implemented but proved to be too time-consuming given rapidly rising case counts. A quick Plan-Do-Study-Act (PDSA) cycle identified the need for further improvement with technical assistance. An "outstanding case" document was created to notify LHD staff of outstanding cases in their jurisdiction. The document identified what actions needed to be completed in order to approve the case and was electronically shared amongst counties with outstanding cases.

RESULTS: At the time of implementation of the outstanding case list, there were 50 outstanding cases. Within 2 days of county notification, outstanding cases decreased to 27. Prior to a second notification, outstanding cases totaled 35, decreasing to 20 after notification.

CONCLUSIONS: As case counts increased across more counties in Kentucky, outstanding cases continued to be an issue. However, recurring distribution of the outstanding case list yielded similar results, allowing cases to be confirmed in a timelier manner and PEP offered to more individuals. Improved communication between KDPH and investigators in LHDs allowed for swift improvement of HAV reporting, setting a standard for communication and rapid response in future outbreaks. The outstanding list has been beneficial as a reminder to LHD staff, who typically work on multiple tasks daily. Although delayed reporting continues to occur on occasion, routine notification of these cases has resulted in fewer missed opportunities for PEP.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Communication; Hepatitis; Surveillance
Consider for Different Presentation?	Yes
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Submission Type	Breakout/Quick/Lightning/Poster
ID	11236
Abstract Type	Lightning
Abstract Title	Negative Impacts of Surveillance Definition Change on Kentucky's Ongoing Hepatitis A Virus Outbreak

Abstract

BACKGROUND: Kentucky declared an acute hepatitis A virus (HAV) outbreak in November 2017. Kentucky's outbreak definition incorporates positive HAV-sequencing results, risk factor information, and the CSTE 2012 surveillance case definition. Recently, CSTE voted to adopt a revised definition effective January 2019. Key differences between surveillance definitions include minimum bilirubin levels if jaundice is unknown, minimum serum alanine aminotransferase (ALT) levels, nucleic acid amplification test (NAAT) for HAV RNA positive, and absence of more likely diagnoses. This project identified how changing surveillance definition during an ongoing outbreak affects the number of cases identified and investigated.

METHODS: Data collected for previous outbreak-associated cases were reviewed to determine whether case status would change using the 2019 definition. If jaundice was not reported, cases with ALT levels under 200 IU/L were excluded. Cases with bilirubin levels of at least 3.0 mg/dL were included. ALT levels were evaluated before bilirubin levels since they are not consistently reported. More likely diagnoses were not considered. Although HAV sequencing information was available for some case specimens, this could not be evaluated for all cases due to a significant delay in receiving results for all specimens. Data from August 1, 2017 through December 29, 2018 (end of 2018 MMWR week 52) were used.

RESULTS: Of 3421 outbreak-associated cases, 3381 met 2012 surveillance and outbreak definition criteria. Non-surveillance cases include 40 individuals with positive HAV sequencing, which would be included under 2019 criteria. Using 2019 criteria for jaundice, bilirubin levels, and ALT levels, 166 cases were excluded (N=3255), a 4.9% decrease. Jaundice was unknown for 365 cases. ALT information was unknown for 69 cases. Bilirubin information was available for 582 cases, 448 of which met bilirubin level criteria. Five cases that would have been excluded worked in high-risk settings.

CONCLUSIONS: This project highlights the importance of considering milder forms of illness during a large, ongoing outbreak. With limited resources, it is difficult for local investigators to prioritize case investigations when illnesses do not meet surveillance definition but meet outbreak definition. Revising the outbreak definition to incorporate changes in the 2019 surveillance case definition would exclude several cases, even those positive for HAV by sequencing. Cases excluded using 2019 criteria would not have been investigated, leading to an underestimation of HAV cases and decreased ability to provide education and implement control measures prevent further transmission among non-risk populations.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Outbreaks; Surveillance; Hepatitis
Consider for Different Presentation?	Yes
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Submission Type ID	Breakout/Quick/Lightning/Poster
Abstract Type	Poster
Abstract Title	An Evaluation of Hepatitis C Surveillance — Harris County, TX, 2010-2018

Abstract

BACKGROUND: Chronic Hepatitis C virus (HCV) infects an estimated 4.1 million persons in the US (Hofmeister et al., 2018). In 2016, nearly 3,000 cases of acute HCV were reported, with estimates that the actual total exceeds 40,000 (CDC, 2018). HCV burden grows each year and screening has increased as recommendations have changed (CDC, 2018; USPSTF, 2013). This increase, along with evolving treatment options, changes in case definition, and implementation of electronic laboratory reports (ELRs), all contribute to the increase in Hepatitis C reports received by Harris County Public Health (HCPH). As a result of these changes, we identified the need to evaluate, update, and improve our HCV surveillance system.

METHODS: The purpose of this evaluation was to understand timeliness, simplicity, flexibility, data quality, and usefulness within HCPH's current HCV surveillance system. We utilized *Updated Guidelines for Evaluating Public Health Surveillance Systems* (MMWR, 2001) to evaluate all Hepatitis C reports received from January 1, 2010 through October 31, 2018. Data were pulled from our Insight database and imported to STATA 14.2 for cleaning and analysis. Results were used to identify strengths and weaknesses within HCPH's current surveillance system and formulate recommendations for improvement.

RESULTS: For the specified time period, we investigated 765 reports. Over half (51.6%) were referred to other jurisdictions, while the remaining 370 belonged to HCPH. We observed variability in the number of annual reports, ranging from four in 2011 to 177 through October 2018. We also noted a sharp increase in reports beginning in 2017. This recent influx requires greater resource utilization, while the total number of acute cases, which are reportable in Texas, has not exceeded five in any given year. Most demographic data were complete, except for missing data on race (5.8%), ethnicity (9.7%), or both fields (29.6%). The average time from report receipt to completion was 17.9 days and the median was eight days.

CONCLUSIONS: This evaluation shows that although HCV reports have increased over time, the number of acute HCV cases identified have remained relatively stable, a finding which warrants further study to understand the reasons for the variance. We identified timeliness and completeness of certain variables, including race and ethnicity, as areas for improvement. Action is required to more accurately capture cases and streamline report completion. Results from this evaluation will be applied to future projects to improve our HCV surveillance system, including increasing sensitivity, using HCV ELRs.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Hepatitis; Surveillance; Evaluation
Consider for Different Presentation?	Yes
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Submission Type ID	Breakout/Quick/Lightning/Poster
Abstract Type	11398
Abstract Title	Poster
	Assessing Hepatitis B Case Categorization through Positive IgM Anti-Hbc Results in Jefferson County, Kentucky

Abstract

BACKGROUND: IgM antibody to hepatitis B core antigen (IgM anti-HBc) is considered an important diagnostic marker of acute hepatitis B and distinguisher between chronic infection. In addition to clinical symptoms and abnormal liver function tests, the acute hepatitis B case definition conditionally requires a positive IgM anti-HBc test if done. All 2016-2017 IgM anti-HBc lab reports received were assessed how many were associated with an acute confirmed infection. Lacking a probable case definition, we evaluated remaining positive labs to discern which criteria failed to meet the confirmed case definition.

METHODS: Lab reports and confirmed acute cases were extracted from Kentucky's National Electronic Disease Surveillance System (NEDSS) for years 2016-2017. All IgM anti-HBc results were categorized as positive, negative, or undetermined. Each category of lab results associated with an acute case was determined. Positive IgM anti-HBc results not connected with a case were investigated to find which criteria did not meet case definition (positive HBsAg result, symptomatic, elevated liver enzymes or jaundiced, and previous history of infection).

RESULTS: Among 3822 IgM anti-HBc associated lab reports for years 2016-2017, 6 indeterminate results and 2 orphaned records were excluded from further investigation. All 46 acute Hepatitis B cases have an associated positive IgM anti-HBc lab result. Amid the remaining 124 (72.3%) positive labs were not associated with an acute case, 2 (1.6%) were misclassified, 22 (17.7%) positive results lacked at least one unknown or unrecorded criterion to classify, 68 (54.8%) reported no clinical signs or symptoms, 31 (25%) had negative HBsAg testing, 38 (30.6%) had no HBsAg recorded, 36 (29%) had normal liver function tests, 61 (49.2%) lacked liver function testing or noted jaundice.

CONCLUSIONS: Classification of acute hepatitis B requires several criteria from different categories, and incomplete reporting is a major challenge of passive surveillance. A modified electronic surveillance system with improvement of how information is entered and stored in a standardized process will lead to more accurate results. Though a positive IgM anti-HBc result is often regarded as an important marker, less than a third of positive lab results were seen to be acute cases; this warrants the importance of a complete evaluation of other criteria and receiving accurate information from providers.

Submission Complete?	Yes
Committee Topic	Infectious Disease
Keywords	Hepatitis
Consider for Different Presentation?	Hepatitis; NNDSS; Surveillance
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Submission Type	Breakout/Quick/Lightning/Poster
ID	10910
Abstract Type	Poster
Abstract Title	Development of a Best Practices Hepatitis C Virus Testing Algorithm

Abstract

BACKGROUND: About 71 million people are infected with chronic hepatitis C virus (HCV); almost 400,000 die annually from its complications. CDC recommends targeted screening (August 2012) and streamlined testing (May 2013): a reactive HCV antibody (Ab) test should be followed by confirmatory HCV RNA viral load (HCVL). After input from key clinical providers, critical laboratory personnel, and administration, Lifespan labs instituted a novel testing protocol that adheres to this national guideline and optimizes patient testing.

METHODS: Prior testing involved HCV Ab screening; with reactive results requiring the clinician to call the patient back for a second blood draw for confirmation of active disease using a RNA test. • Internal medicine and Pathology jointly approached the Medical Executive Committee (October 2015) to approve an automatic reflex from a positive Ab to a confirmatory RNA test. This allowed two blood specimens to be drawn at one time.

- The Laboratory Information (LI) department created an algorithm automatically initiating this reflex testing.
- To ensure patient specimens remained stable for RNA detection, use of plasma preparation tubes were instituted.
- The protocol went live in March 2016 with a qualitative RNA test (Hologic).

Further optimization in July 2017 included validating a quantitative HCVL test (Roche Diagnostics) and the qualitative test was eliminated.

RESULTS: With implementation of reflex testing, patient samples more than doubled; processing and technical labor increased. From July to December 2017, 12,727 HCV Ab tests were performed; of those, 508 were positive (3.9%) and reflexed to the HCVL (44% were confirmed active disease). 200 of these active patients were randomly selected and evaluated to assess how automatic reflex changed test ordering. More true positive HCV patients were identified; yet 30% had multiple Ab tests performed unnecessarily. Based on this repetitive testing, we worked with the LI department and laboratory leadership to formulate an appropriate auto-cancel algorithm.

CONCLUSIONS: Patients tested through Lifespan get HCV Ab screening and a baseline HCVL from one phlebotomy visit. This optimizes follow-up for treatment of HCV and value of reflex testing on patient outcomes. Because of the high percentage of repeat Ab testing, we utilized the electronic medical record to auto-reject duplicate requests in those with active HCV. Future investigation of the reduction of this superfluous testing will be warranted to determine the impact on both laboratory costs and patient care.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Hepatitis; Cost-Effectiveness
Consider for Different Presentation?	Yes
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Submission Type	Breakout/Quick/Lightning/Poster
ID	11002
Abstract Type	Poster
Abstract Title	Epidemiologic and Clinical Differences between Treated and Untreated Hepatitis C Patients in Rhode Island

Abstract

BACKGROUND: The majority of Hepatitis C virus (HCV) testing in Rhode Island (RI) occurs at Lifespan laboratories, providing an opportunity for comprehensive review of HCV screening and treatment practices. The objective of this study is to identify clinical and socioeconomic factors associated with patients who were treated for HCV vs those who were not.

METHODS: 2028 quantitative Hep C viral loads (HCVL) were performed between 7/1/2017 and 12/31/2017 at Lifespan laboratories. Duplicates were removed, leaving 1544 unique patients. Patients with negative Hep C antibody/negative HCVL were excluded. Screening and treatment locations, gender, age, intravenous drug abuse (IVDA), alcohol abuse, presence of cirrhosis, Fibrosis-4 score, human immunodeficiency virus (HIV) co-infection, and insurance were extracted from medical records of 200 randomly selected confirmed Hep C infected patients. Statistically significant differences between the treated/non-treated were calculated using single tailed fisher exact test and odds ratios.

RESULTS: Of 200 patients reviewed, 64% (127/200) had undetectable HCVLs: 15% spontaneously cleared, 69% had sustained virologic response (SVR), and 8% were treated but had a 12-week SVR pending. 40% of patients were treated at gastroenterology (GI), and 30% at infectious disease (ID) clinics. 36.5% (73/200) of patients had detectable HCVLs: 92% were untreated, 4% failed treatment, and 4% were treated then re-infected. No statistically significant differences were found in gender, IVDA, alcohol abuse, and HIV co-infection between the treated and untreated groups. Patients were more likely to be treated if born between 1945 and 1965 (OR 2.5, 95 CI 1.3-4.8, $p = .004$), had a Fib4 score of 1.45-3.25 (OR, 95 CI 1.1-3.9, $p = .02$), compensated cirrhosis (OR 6.1, 95 CI 2.2-16.6, $p = <.001$), or initially screened at an ID clinic (OR 2.6, 95 CI 0.9-6.9, $p = .03$). Patients were less likely to be treated if born after 1965 (OR 0.5, 95 CI 0.2-0.9, $p = .02$), and screened while an inpatient (OR 0.16, 95 CI .04-.6, $p = .003$).

CONCLUSIONS: A HCV screening/treatment training program for RI primary care providers would be helpful to increase treatment of those screened at IM, FM, and GI clinics. The program should focus on those born after 1965; with the opioid epidemic afflicting younger patients those born after 1965 are at an increasing risk of acquiring HCV. And, this year RI passed legislation extending Medicare coverage for treatment of all Fib4 scores/ fibrosis stages so treatment efforts should also focus on Medicare patients with Fib4 scores <1.45 .

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Hepatitis; Infectious Diseases; Screening
Consider for Different Presentation?	Yes
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Submission Type ID	Breakout/Quick/Lightning/Poster
Abstract Type	Poster
Abstract Title	Epidemiological Study of Eight West Virginia Counties Involved in Statewide Hepatitis A Outbreak, March-December 2018

Abstract

BACKGROUND: Hepatitis A is a communicable disease transmitted by the fecal-oral route or by consumption of contaminated food or water. It is caused by the hepatitis A virus and can inflame and damage the liver and is typically an acute infection. West Virginia has seen a recent increase in the number of hepatitis A cases since March 2018. In the whole state of West Virginia, there have been 2,089 confirmed cases as of October 19, 2018, 634 of which were in Boone, Cabell, Jackson, Lincoln, Logan, Mason, Mingo, and Wayne counties.

METHODS: I am conducting a retrospective observational study to look at the prevalence and incidence of hepatitis A cases in these eight counties and compare these values from before and during the outbreak. I will also determine associated risk factors, including concurrent hepatitis B infection, hepatitis C infection, or both hepatitis B and C infection, homelessness, IV drug use, non-IV drug use, and recent incarceration using relative risk, increased risk, and odds ratio. The population of this study will include cases of hepatitis A collected by the regional epidemiologist at Cabell Huntington Health Department during the non-outbreak and outbreak periods in these eight counties. Confirmed hepatitis A cases will be identified using the case definition determined by the CDC and the Cabell Huntington Health Department records will be studied for demographic characteristics, possible exposures and risk factors, signs and symptoms, infectious periods, and other relevant information. The data will be collected from equivalent non-outbreak and outbreak time periods. Identifiable information will be removed from the data to maintain patient confidentiality. Data analysis will be done using SAS software and using the CDC's program Epi Info™ to generate statistics and visual aids.

RESULTS: Preliminary evaluations indicate a possible link with IV drug use and co-infection with hepatitis C. This will be further investigated along with other associated risk factors as reported cases within the window are investigated and completed.

CONCLUSIONS: This project will show the spread of hepatitis A in these eight West Virginia counties, and will identify the populations most at-risk for developing Hepatitis A. My findings will help the health department and other health organizations focus their resources, especially testing and vaccination, to control the spread of hepatitis A.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Epidemiology; Risk Factors; Hepatitis
Consider for Different Presentation?	Yes
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Submission Type	Breakout/Quick/Lightning/Poster
ID	11682
Abstract Type	Poster
Abstract Title	Estimation of Hepatitis C Prevalence in Allegheny County, PA

Abstract

BACKGROUND: Infection with hepatitis C virus (HCV) can cause severe liver disease if not diagnosed and treated. The Allegheny County Health Department (ACHD) is collaborating with partner agencies to increase HCV testing and treatment. To help determine resources needed, ACHD estimated the number of county residents exposed to HCV (antibody positive) and the number currently infected (RNA positive) using the methodology published by Hofmeister et al.

METHODS: The number of HCV-positive noninstitutionalized adults ≥ 18 years was estimated using the National Health and Nutrition Examination Survey (NHANES) HCV prevalence estimates for 2013-2016 (1.5% HCV antibody positive and 0.9% RNA positive). The number of HCV-positive persons in populations excluded from NHANES was estimated using HCV antibody/RNA prevalence estimates derived by Hofmeister et al for the homeless (14.7%/10.8%), the incarcerated (16.1%/10.7%), nursing home residents (1.3%/0.5%), and active military personnel (1.0%/0.5%). The population size for these groups in Allegheny County was estimated based on local surveys (nursing homes, homeless), county jail and state prison census (incarcerated), and a proportion of the statewide active military census. Estimates of HCV prevalence were compared with the number of HCV cases reported to ACHD.

RESULTS: Of noninstitutionalized adults (≥ 18 years) in Allegheny County, we estimated that 14,674 (1.5%) are HCV antibody positive and 8,806 (0.9%) are RNA positive. HCV-antibody positive estimates for excluded groups include 168 homeless, 915 incarcerated, 88 nursing home residents, and 6 active duty military personnel for a total of 15,373 HCV antibody positive persons in the county. Similarly, adding 124 homeless, 608 incarcerated, 34 nursing home residents, and 3 military personnel yields a total of 9,575 HCV RNA positive persons. By comparison, in 2006-2017, 18,885 persons were reported to ACHD as HCV antibody positive and 13,021 as HCV RNA positive.

CONCLUSIONS: The estimates of HCV-positive persons in Allegheny County are lower than the number of persons already reported. Estimates may be too low if 1) NHANES underestimates prevalence in the general population, 2) the county's population is at higher risk than the nation as a whole, e.g. includes a higher percentage of substance users, 3) the prevalence in the county's excluded groups is higher than Hofmeister's values or 4) local surveys underestimate size of the excluded populations. Reports received by ACHD in the past exceed the number of current residents already diagnosed due to migration, death, or other factors. Alternative methods of estimating current prevalence are needed to better assess burden and target resources.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Local Epidemiology; Hepatitis
Consider for Different Presentation?	Yes
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Submission Type	Breakout/Quick/Lightning/Poster
ID	11555
Abstract Type	Poster
Abstract Title	Hepatitis C Cause of Death in North Carolina, 2017

Abstract

BACKGROUND: It is estimated that there are 150,000 individuals in North Carolina infected with hepatitis C (HCV). Despite the growing burden of disease, little is known about cause(s) of death for individuals with HCV. HCV electronic laboratory records became reportable by law in North Carolina in October of 2016. Currently, North Carolina collects limited risk data for chronic HCV. Utilizing two years of HCV reporting data, we matched and analyzed ICD-10 codes from death certificates to assess the cause(s) of death for individuals with acute and chronic HCV.

METHODS: We used the Centers for Disease Control and Prevention (CDC) Link Plus cancer registry linkage program to match case records to death certificates and identify cause(s) of death in individuals diagnosed with HCV in the state of North Carolina in the year 2017. Individuals were matched based on their first and last name, date of birth, social security number, and race/ethnicity. SAS 9.4 (Cary, NC) programming was utilized to merge death records from Link Plus with HCV cases in our North Carolina Electronic Disease Surveillance System (NC EDSS).

RESULTS: In total, laboratory test results for 19,773 North Carolina residents with HCV were received in 2017. Among these, we identified 567 persons with matching death certificates. Each death certificate contained between one and eleven ICD-10 codes defining their cause(s) of death. The average age at death was 54.6 years (range, 20-91 years). The majority of people with HCV case records were men (11,700/19,773, 59%), and the overall case-fatality rate was higher among men (365/567, 68%). However, women had a higher case-fatality rate in the 25-29 (18/29, 62%) and 40-44 (12/20, 60%) age groups. Further investigation revealed a higher proportion of deaths among women ages 20-34 in the category of "accidental poisoning and exposure to drugs" (19/30, 63%), compared to 41% of male deaths in the same age group (23/56). Men had the highest overall proportion of deaths due to "Neoplasms" (77/365, 21%) compared to 13.7% for women (25/182).

CONCLUSIONS: Matching death certificate data to HCV case data in NC EDSS allows us to determine the cause(s) of death and other comorbidities in individuals diagnosed with HCV. The ongoing effect of the opioid epidemic can be seen in the proportion of drug exposure in the deaths of HCV recorded individuals. Efforts to increase access to treatment could decrease death rates in this group.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Epidemiology; Hepatitis
Consider for Different Presentation?	Yes
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Submission Type ID	Breakout/Quick/Lightning/Poster
Abstract Type	Poster
Abstract Title	Hepatitis C Screening and Treatment in the Vermont Medicaid Population

Abstract

BACKGROUND: In 2018, Vermont joined 9 other states in partnering with the U.S. Department of Health and Human Services Hepatitis C (HCV) Medicaid Affinity Group. The Group's goal is to increase the number of Medicaid enrollees living with HCV who are treated and cured. The Vermont Department of Health and Department of Vermont Health Access (DVHA), Vermont's Medicaid agency, collaborated on several strategies including improving testing, referral and treatment for Medicaid enrollees, and enhancing provider knowledge and reducing stigma around HCV. The Group developed outcome measures to identify needs and monitor progress toward goals.

METHODS: Administrative billing claims, from DVHA, were pulled for January 2015-June 2018. Five outcome measures: HCV screening, confirmation of diagnosis, chronic HCV prevalence, treatment of chronic HCV, and post-treatment care, were calculated in SAS 9.3. Measures used ICD-9-CM and ICD-10-CM codes to identify patients diagnosed with HCV. Procedure codes identified claims associated with an antibody or RNA screening test. National Drug Codes for direct acting anti-HCV agents (DAA) identified people receiving treatment. Data also were stratified by individuals who inject drugs, using diagnosis and procedure codes, and baby-boomers (born 1945-1965). Measures were calculated for two reporting periods; calendar year 2017 and July 2017-June 2018.

RESULTS: In 2017, 7,528 enrollees or 5.0% of the Medicaid eligible population ages 18 years and over were screened for HCV using an RNA and/or an antibody test. The rate remained the same (4.9%) for the July-June reporting period. In 2017, the rate for baby-boomers was 4.8% and the preliminary rate for individuals who inject drugs was 88.7%. Approximately 92.3% (n=263) of enrollees who received an antibody test had their results confirmed with an RNA test. The prevalence rate for chronic HCV was 1.6%. In 2017, approximately 12.1% of enrollees ages 18 years and over with an HCV test and chronic HCV diagnosis were treated with DAAs. Additionally, DVHA saw a steep increase in individuals being treated with DAAs in the beginning of 2018.

CONCLUSIONS: There is room for improvement in screening and treatment of HCV, but Vermont is making progress. Providers are screening the majority of identified individuals who inject drugs, but the low screening rate among baby-boomers warrants further investigation. In 2018, Vermont removed all fibrosis and sobriety restrictions for receiving treatment. This change in treatment policy expanded DAA access for Medicaid enrollees. The impact of these changes was evident in the data, but continued surveillance is necessary to track the trends in treatment.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Surveillance; Hepatitis; Outcome Measures
Consider for Different Presentation?	Yes
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Submission Type	Breakout/Quick/Lightning/Poster
ID	10945
Abstract Type	Poster
Abstract Title	Identification of Sustained Virologic Response Among Individuals with Hepatitis C Virus Infection — Chicago, Illinois

Abstract

BACKGROUND: Hepatitis C treatment is not routinely collected in surveillance, creating difficulty in calculating proportion of persons with hepatitis C achieving sustained virologic response (SVR), (i.e., cure). However, a laboratory algorithm for this purpose has been proposed using negative hepatitis C virus (HCV) RNA tests to identify those in treatment (1 negative RNA test) and those with SVR (2 negative RNA tests). A public health collaborative, the Hepatitis C Community Alliance to Test and Treat (HepCCATT), has created a novel hepatitis C registry containing both laboratory and pharmacy data. We used this registry to compare SVR percentages derived from the laboratory algorithm with those from a treatment algorithm.

METHODS: The registry comprises data from electronic surveillance, pharmacy chains (n = 2), and clinics (n = 11) in Chicago. We calculated SVR status for 2,754 persons tested at these clinics with positive HCV antibody testing or any HCV RNA testing during September 30, 2013–September 30, 2018. SVR was calculated using 2 algorithms, including ≥ 1 positive RNA followed by ≥ 2 negative RNA tests without further positive values (laboratory algorithm); secondly, evidence of treatment and a negative posttreatment RNA (treatment algorithm).

RESULTS: Both algorithms yielded similar SVR percentages (laboratory: 6.7% [184/2,754]; treatment: 7.5% [206/2,754]). Among 324 unique persons identified as having SVR, 66 (20.4%) were identified by both methods, 118 (36.4%) by laboratory algorithm only, and 140 (43.2%) by treatment algorithm only.

CONCLUSIONS: Inclusion of pharmacy data identified SVR among people who would not be identified using routinely collected surveillance data. SVR identified by the laboratory algorithm alone might result from missing treatment data or spontaneous resolution of infection. Enrollment of additional pharmacy chains to the registry are planned; future studies should determine if treatment data from additional pharmacies validate more instances of SVR identified by the laboratory algorithm. To better estimate SVR, public health jurisdictions could consider incorporating pharmacy data into standard hepatitis C surveillance.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Hepatitis; Outcome Measures; Surveillance
Consider for Different Presentation?	Yes
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Submission Type ID	Breakout/Quick/Lightning/Poster
Abstract Type	11672
Abstract Title	Poster
	National Surveillance for Hepatitis Among Sexual Minority Populations

Abstract

BACKGROUND: Cases of hepatitis B and C reported to the CDC rarely contain information regarding sexual identity, but national population surveys may serve as a valuable source of surveillance data. The purpose of this research is to determine if stable estimates of hepatitis can be obtained from the National Health Interview Survey (NHIS) and a collective estimate of hepatitis B and C from the National Survey on Drug Use and Health (NSDUH) for sexual minority populations.

METHODS: Data from 2015–2017 were pooled to increase the sample size for self-reported estimates of lifetime hepatitis from NHIS and lifetime hepatitis B or C from NSDUH for men and women who identified as straight, gay/lesbian, or bisexual. NHIS was used to estimate hepatitis screening in these populations and NSDUH was used to estimate lifetime injection drug use (IDU). Analyses accounted for each survey's sampling design and applied National Center for Health Statistics (NCHS) standards for display of proportions.

RESULTS: Higher proportions of gay men reported hepatitis in both NHIS (9.3%) and NSDUH (6.5%) compared to straight men (2.7% and 1.6%, respectively). Estimates for bisexual men were unstable for NHIS, and estimated at 3.4% for NSDUH. Screening for both hepatitis B and hepatitis C was highest among gay men, and lifetime IDU was highest among bisexual men. For women, hepatitis prevalence could be estimated for all groups in both NHIS and NSDUH. In NSDUH, hepatitis was more common in bisexual women (2.0%) compared to straight women (1.0%); however, in NHIS, hepatitis prevalence did not vary significantly for women who identified as straight, lesbian/gay, and bisexual. Lifetime IDU was higher for women identifying as bisexual (4.4%) compared to straight women (1.0%).

CONCLUSIONS: NSDUH produced stable estimates of lifetime hepatitis B/C for all sexual minority groups, and NHIS produced stable estimates of lifetime hepatitis for all groups except bisexual men. The higher prevalence of screening among gay men may explain in part the higher proportion reporting hepatitis compared to bisexual men, bisexual women, and gay/lesbian women. Results from NSDUH show that women who identify as bisexual are at higher risk for hepatitis B and C compared to straight women—findings that are consistent with IDU estimates but not replicated in NHIS.

Submission Complete?	Yes
Committee Topic	Infectious Disease
Keywords	Hepatitis
Consider for Different Presentation?	Hepatitis; Minority Health; Behavioral Health
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Submission Type	Breakout/Quick/Lightning/Poster
ID	11007
Abstract Type	Poster
Abstract Title	Tennessee's 2017 Hepatitis C Virus Continuum of Cure

Abstract

BACKGROUND: Hepatitis C virus (HCV) is the most common bloodborne pathogen in the U.S. and accounts for more deaths than all other communicable diseases combined. HCV can be cured with 2-3 months of treatment; however, only about half of people living with HCV are diagnosed, and far fewer access treatment. We utilized HCV surveillance data to develop a statewide HCV continuum of cure (CoC), quantifying access to HCV diagnostics and rates of viral clearance and subsequent infection.

METHODS: We defined our cohort as clients with an acute or newly reported chronic HCV NBS investigation start date between July 1, 2015-December 31, 2016, and thought to be alive and living in TN as of December 31, 2017. TN vital statistics all-cause death data (2015-2017) was used to exclude deceased clients, and most recent state of residence in NBS was used to determine residence. "Diagnosed" clients had a positive HCV Ab or RNA; confirmatory status was based on first HCV RNA on/after diagnosis, stratified as "cleared", "unknown", or "confirmed" based on the RNA results; "cured" clients were "confirmed" clients who had at least one negative HCV RNA following confirmatory RNA; clients with "subsequent infection" were among "cleared" and "cured" clients whose most recent RNA was positive. Laboratory information within NBS through December 20, 2018 was utilized to build the CoC. All data was aggregated and analyzed using SAS 9.4.

RESULTS: From July 2015 to December 2016, 26,659 clients were diagnosed with acute or newly reported chronic HCV in TN, of whom 1,561 died and 46 moved out of state by the end of 2017. Among the 25,052 "diagnosed" clients, 2.4% (n=613) had lab evidence of "cleared", 49.2% (n=12,319) "unknown", and 48.4% (n=12,120) "confirmed" HCV status. Among "confirmed" clients, 13.4% (n=1,622) were "cured"; and among "cleared" and "cured" clients, 6.9% (n=155) developed subsequent infection (14.7% and 4.0%, respectively).

CONCLUSIONS: The development of an HCV CoC provides a unique opportunity to characterize a jurisdiction's HCV epidemic, monitor progress toward elimination goals, and identify and quantify areas of potential intervention (such as confirmatory testing and linkage to prevention and treatment services). The HCV CoC framework and analysis presented here demonstrates the feasibility and utility of producing a jurisdiction-wide CoC predicated solely on surveillance laboratory data. Limitations include the potential for incomplete data reporting (particularly of negative HCV RNA results) as well as the inability to discern between persistent versus re-infection among clients deemed to have "subsequent infection."

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Hepatitis; Surveillance; Epidemiologic Methods
Consider for Different Presentation?	Yes
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Submission Type ID	Breakout/Quick/Lightning/Poster
Abstract Type	Poster
Abstract Title	Trends in Hepatitis C Testing in Los Angeles County, 2013-2018

Abstract

BACKGROUND: Following hepatitis C virus (HCV) acquisition, approximately 70% of persons will develop chronic infection. Chronic HCV infection can result in cirrhosis, liver cancer, and death. Many persons with chronic HCV infection are asymptomatic so identification of infected persons depends on screening at-risk populations. Guidelines recommend HCV testing for persons with risk factors for HCV infection and, as of 2012, one-time testing for all persons born between 1945 and 1965 (birth-cohort screening). Safe and highly-effective second-generation HCV antiviral drugs were introduced in 2013. We describe trends in and characteristics of persons tested for HCV in Los Angeles County (LAC) during 2013–2018.

METHODS: In LAC, chronic HCV surveillance occurs through mandated electronic laboratory reporting of positive HCV tests (antibody, polymerase chain reaction [PCR], genotype). Additionally, certain laboratories voluntarily report negative HCV PCR results. Reports from 2013-2018 were deduplicated at the test level by test type, result, and date. A probabilistic record linkage program, Link Plus, was used to deduplicate cases that had been reported multiple times. Frequencies by test type, year, and demographics were generated.

RESULTS: During 2013–2018, 291,872 HCV test results were reported for 102,620 unique persons in LAC. The number of reported HCV antibody tests increased from 12,059 in 2013 to 23,556 in 2018. Among persons with a positive HCV antibody test, 46,753 (63%) were male, 42,719 (57%) were in the birth-cohort, and 38,273 (51%) had an associated PCR/genotype result. In 2013, 2,912 (28%) of persons with positive HCV antibody tests had an associated PCR test result compared with 9,056 (48%) in 2018. In 2013, 877 (6%) of persons had PCR results that were negative or below the limit of detection, compared with 6,167 (22%) in 2018.

CONCLUSIONS: The number of positive HCV antibody tests reported from 2013 to 2018 potentially represents increased screening for HCV. The majority of screening tests occurred in the birth-cohort. A greater than expected proportion of persons with a positive antibody test lacked a corresponding positive PCR test, indicating that many are not receiving appropriate follow-up confirmatory testing. The number of persons with undetectable PCR results increased during the study period, which could be related to an increase in the number of persons receiving HCV treatment.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Hepatitis; Surveillance
Consider for Different Presentation?	Yes
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Submission Type	Breakout/Quick/Lightning/Poster
ID	11312
Abstract Type	Quick
Abstract Title	CDC Division of Viral Hepatitis Support of NNDSS Modernization Initiative (NMI)

Abstract

BACKGROUND: Cases of viral hepatitis are voluntarily reported to CDC by state and territorial health departments via CDC's National Notifiable Disease Surveillance System (NNDSS). Most jurisdictions collect case data using a formatted questionnaire and report those data using the National Electronic Telecommunications System for Surveillance (NETSS) that has been receiving electronic data since 1990. About 20 jurisdictions are currently transmitting or preparing to transmit production generic and hepatitis specific surveillance data using a more current and extensive case report form via the NNDSS Master Message. Most of these systems are using the NEDDSS Base System to collect data.

METHODS: The Division of Viral Hepatitis (DVH) continues to collaborate with the Center for Surveillance, Epidemiology, and Laboratory Services and CSTE (DSTDP) at CDC to develop HL7 message mapping guides for Acute Hepatitis A, B and C, Perinatal Hepatitis B, and Chronic Hepatitis B and C. DVH continues to work with CSELS and other CDC programs to standardize and harmonize both the data elements that are collected and HL7 messages. DVH works with states to answer questions related to the viral hepatitis data collection and hepatitis HL7 message. DVH also conduct data quality assurance by validating data collected using the hepatitis HL7 message and collecting and responding to comments from states regarding the utility of the current viral hepatitis collection form.

RESULTS: In addition to working with states to implement the hepatitis specific HL7 message, CDC and DVH have also rolled out the new HL7 message guides for perinatal hepatitis C. This presentation will provide current statistics on data quality, describe the HL7 message and processes, and provide an overview of the perinatal hepatitis C message.

CONCLUSIONS: DVH has worked diligently to translate our current data collection methods into a standardized and harmonized format that will make data collection easier for States and data management and reporting easier for CDC.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Surveillance; Hepatitis; NNDSS
Consider for Different Presentation?	Yes
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Submission Type	Breakout/Quick/Lightning/Poster
ID	11072
Abstract Type	Quick
Abstract Title	Hepatitis C Care Cascade Among Medicaid-Enrolled Women of Childbearing Age, Wisconsin, 2015-2018

Abstract

BACKGROUND: Recent increases in hepatitis C virus (HCV) infections among women of childbearing age are concerning because infants born to women with HCV can become infected perinatally. The curative treatment for HCV, direct-acting antiviral (DAA) medication, is not approved for use in pregnant women and there is no intervention to prevent infection of the infant. Therefore, to prevent perinatal HCV transmission, women need to move through the steps of the HCV “care cascade”, including screening for HCV infection, confirmation of the diagnosis, and treatment with DAAs, before becoming pregnant. As a project for the federally-organized HCV/Medicaid Affinity Group, we evaluated the HCV care cascade among women of childbearing age enrolled in Wisconsin Medicaid. Additionally, we evaluated whether more women received DAA treatment after Wisconsin Medicaid policy changed in 2017, allowing patients with any level of liver damage to receive DAAs.

METHODS: Using Wisconsin Medicaid enrollment and claims data, we identified a cohort of women age 15-44 years who were continuously Medicaid-eligible for ≥12 months during 2015-2018. We extracted information regarding claims for HCV antibody testing, HCV RNA testing, and DAA treatment. These data were linked, by the woman’s name and birth date, to HCV surveillance data to identify any positive HCV antibody or RNA results. We defined the steps of the care cascade as (1) screening: ≥1 claim for HCV antibody testing, (2) confirmatory testing: ≥1 claim for RNA testing, (3) treatment initiation: ≥1 claim for DAA treatment.

RESULTS: Of the 305,315 women in the cohort, 27,452 (9%) were screened for HCV. Of these women, 886 (3%) had positive HCV antibody results indicating the need for confirmatory testing. Of the 886 antibody-positive women, 693 (78%) received RNA confirmatory testing. Of these 693 women, 544 (78%) had positive RNA results confirming the diagnosis. Of the 544 women with confirmed HCV, 90 (17%) initiated treatment. When stratified by the year of first antibody-positive result, the percentage of women with confirmed HCV who initiated treatment increased from 13% among women first antibody-positive in 2015 to 23% among women first antibody-positive in 2017.

CONCLUSIONS: By linking Medicaid claims and surveillance data, we established a method for evaluating the HCV care cascade among Medicaid-eligible women of childbearing age in Wisconsin. The percentage of newly-diagnosed women treated with DAAs increased after the Medicaid policy change, but remained low. To improve the identification and treatment of women with HCV, provider education is needed regarding HCV testing, treatment, and current Medicaid policy.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Hepatitis
Consider for Different Presentation?	Yes
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Submission Type	Breakout/Quick/Lightning/Poster
ID	11794
Abstract Type	Quick
Abstract Title	Increase in Hepatitis A Virus Infections- Florida, 2018

Abstract

BACKGROUND: In 2018, the Florida Department of Health saw an increase in reported cases of hepatitis A virus (HAV). The 560 cases were a 268% increase over the 5-year average of 152 cases and several jurisdictions experienced outbreaks of HAV among persons who are homeless or use injection or non-injection drugs. Descriptive epidemiology was performed to better understand the risk factors of HAV cases and initiate targeted vaccination for at-risk populations.

METHODS: An outbreak case was defined as any confirmed case of hepatitis A that was classified as acquired in Florida (entire exposure period was spent in the state), acquired in Florida or another state/country (cases spent some portion of their exposure period outside of the state), or unknown. Serum specimens were sent to the Bureau of Public Health Laboratories in Tampa (BPHL Tampa) for molecular typing and results were confirmed by the Centers for Disease Control and Prevention (CDC) Division of Viral Hepatitis.

RESULTS: Between December 31, 2017-December 29, 2018, 560 cases of hepatitis A were reported in Florida with 535 meeting outbreak case definition and included in the analysis. 423 cases (76%) were hospitalized and 2 deaths (0.4%) were reported. While cases were reported throughout much of the state, the Tampa Bay and Central Florida areas were primarily affected. The median age was 38 years (range 2-88 years). 353 (63%) cases were male and 405 (76%) identified as non-Hispanic white. The most commonly reported risk factor was drug use in 265 (47%) cases. Fewer cases occurred among persons who were homeless (n=70/13%) or men who have sex with men (MSM) (n=60/11%). The CDC confirmed the genotypes of the 28 samples submitted for sequencing: 21 belong to genotype 1A, and 7 belong to genotype 1B. The 1A strains are similar to strains circulating in Europe and the United States among MSM and not the strains circulating in other states experiencing HAV outbreaks among persons who are homeless or drug users.

CONCLUSIONS: Florida experienced a significant increase in cases of HAV in 2018, primarily among men who use drugs. Results of the genotyping indicate this increase is likely unrelated to other concurrent outbreaks in the United States. In response, county health departments developed targeted vaccination efforts to at risk groups. Additionally, a health advisory and press release were issued by the state surgeon general, and notifications sent to healthcare providers. The situation is ongoing and the vaccination efforts are continuing.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Hepatitis; Infectious Diseases; Epidemiology
Consider for Different Presentation?	Yes
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Submission Type ID	Breakout/Quick/Lightning/Poster
Abstract Type	Quick
Abstract Title	Perinatal Hepatitis C Incidence and Epidemiology of Hepatitis-C Infected Mothers in Michigan, 2012-2016

Abstract

BACKGROUND: Over the last decade there has been an increase in the incidence of Hepatitis C Virus (HCV) associated with the rise of the opioid epidemic. New annual diagnoses in persons aged 18-29 have doubled in Michigan between 2012 and 2016. Females have been equally impacted by this trend and HCV infection in a pregnant woman poses a risk of vertical transmission. A 2014 CDC study estimated the rate of HCV infection at 2.6-5.0 per 1,000 live births in Michigan. Our study looked to measure the known HCV prevalence among women who gave birth and compare the epidemiological characteristics of women known to be infected with HCV versus those who were not. We also sought to measure the number of predicted perinatal HCV infections that have been identified.

METHODS: A de-duplicated dataset of all female HCV patients referred from 2012-2016 was extracted from the Michigan Disease Surveillance System (MDSS). This list was matched to vital statistics birth records based on the mother's name and date of birth using LinkPlus. Variables from the birth record were collected and stratified by HCV status.

RESULTS: Between 2012 and 2016 there were 567,485 live births in Michigan for which 3,926 were from women reported to MDSS with HCV (6.92 per 1,000 live births). Factors significantly associated with HCV infection among women who gave birth included being 20-29 years of age, Caucasian, being a Medicaid beneficiary, and reporting smoking during pregnancy. Women reported for HCV who gave birth were less likely to have completed 8 prenatal care visits, possess a college degree and were less likely to be married compared to women who gave birth that were not known to be infected with HCV. Given a 5-15% rate of vertical HCV transmission we estimated 196-589 perinatal HCV infections. From 2012-2016, there were a total of 26 perinatal cases reported to the MDSS.

CONCLUSIONS: HCV infection rates among pregnant women in Michigan surpassed that of a recent national estimate. Our rate is also an underestimate as HCV infection is often underdiagnosed. Only 4-13% of the predicted number of perinatal HCV infections have been reported to the MDSS, suggesting that HCV testing among newborns is low. Understanding the risk factors associated with HCV infection among pregnant women can help providers prioritize who to screen for HCV. The low rate of perinatal HCV identification suggests efforts to increase clinical knowledge of HCV testing of infants is warranted.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Epidemiology; Hepatitis; Infectious Diseases
Consider for Different Presentation?	Yes
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Submission Type ID	Breakout/Quick/Lightning/Poster
Abstract Type	Quick
Abstract Title	Responses to Hepatitis A in Local County Jails--Indiana, 2018

Abstract

BACKGROUND: Acute hepatitis A infection is caused by the hepatitis A virus. The virus is transmitted via fecal-oral routes, commonly through contaminated food or water, as well as from person to person. The morbidity of hepatitis A in Indiana in 2017 was 0.31 per 100,000. On December 28, 2017, a case of hepatitis A was identified by a local health department in the county's jail (Jail A) and reported to the Indiana State Department of Health (ISDH). On January 10, 2018, a case of hepatitis A was identified in a neighboring county jail (Jail B).

METHODS: The ISDH assessed infection control practices in both jails and reviewed evidence-based best practices with the local health departments and jail staff. The ISDH sent a questionnaire to be used for all ill jail inmates to record case information, requested active surveillance for additional ill individuals, and sent disinfection and isolation recommendations. The ISDH obtained a line list and positive lab results for all suspect cases linked to the original case in Jail A. The number of exposed inmates requiring post-exposure prophylaxis (PEP) was identified in both jails and PEP was administered. An outbreak case was defined using the 2012 Center for Disease Control and Prevention (CDC)-Council of State and Territorial Epidemiologists' (CSTE) definition of acute hepatitis A infection, as well as an epidemiological link to the original case or to an outbreak ongoing in Jefferson County, Kentucky.

RESULTS: Two index cases of hepatitis A was identified in Jail A, followed by five secondary confirmed and suspect cases. Assessment findings indicated that Jail A did not follow all of the best practices for responding to hepatitis A in a jail setting. One confirmed case was identified in Jail B, with no secondary cases. In this instance, the jail staff followed the best practices and were proactive in their response to exposure in the jail.

CONCLUSIONS: The differences between the two local jail responses was reviewed to determine how best to assist local health departments and jails for future situations of infectious illness in this setting. A best practice document for hepatitis A in jail settings was created to ensure future outbreak responses follow the best protocol. Subsequent hepatitis A cases in other local Indiana jails have followed best practices and have not experienced hepatitis A outbreaks within the jail itself. Vaccination of inmates in local jails was identified as a priority for prevention of hepatitis A in Indiana.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Hepatitis; Outbreaks; Underserved Populations
Consider for Different Presentation?	Yes
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Submission Type ID	Breakout/Quick/Lightning/Poster
Abstract Type	Quick
Abstract Title	Use of a Control Bank to Facilitate Recruitment of Controls during a National Outbreak Investigation of Hepatitis A in Canada

Abstract

BACKGROUND: In June 2018 a national outbreak investigation was initiated to investigate a cluster of hepatitis A (HAV) cases in five provinces across Canada.

METHODS: A case was defined as a resident or visitor to Canada with lab-confirmed HAV genotype 1A, one of two genetically related RNA fingerprints, and with illness onset on or after October 1, 2017. A retrospective matched case-control study was conducted to identify the likely source of the outbreak. Three healthy controls, with no previous HAV infection or vaccination against HAV, were recruited for each case and matched based on geography, age group, and sex, using a previously established control bank. When the control bank was exhausted, controls were selected through random landline and cell phone call lists. Food exposures in the case control study were selected based on case exposure information and a literature review of potential sources of HAV. The exposure period was 15-50 days prior to symptom onset for cases, and 15-50 days prior to interview date for controls. McNemar's odd ratios for matched pairs were calculated to provide an estimate of risk associated with exposure and contraction of HAV.

RESULTS: Eighteen cases in five provinces were identified with onset dates from October 31, 2017 to May 24, 2018. Case ages ranged from 3 to 69 years (median age = 40) and 50% were male. Nine cases were hospitalized and no deaths were reported. Results from the case control study pointed to shrimp/prawns (OR: 15.75, $p=0.01$) and blackberries (OR: 7.21, $p=0.02$) as food items of interest. Seventy-two percent of controls were recruited through the control bank, and required on average 25.5 calls per control. In contrast, use of a random listed landline sample required an average of 741.9 calls per control, and a random cell phone sample required an average of 331.7 calls per control.

CONCLUSIONS: Analysis of the case-control data was useful in identifying two foods of interest in the investigation, but limited product specificity from cases and an absence of any product leftovers prevented a food safety investigation. The previously established control bank proved to be a more efficient method for control recruitment than random call lists; however, matching on demographic variables extended the time needed to find eligible controls through all recruitment methods. Other methods of control recruitment, such as online surveys, may prove beneficial for increasing the timeliness and reducing costs of case control studies during an outbreak investigation.

Submission Complete?	Yes
Committee Topic	Infectious Disease Hepatitis
Keywords	Foodborne Disease; Outbreaks; Hepatitis
Consider for Different Presentation?	Yes
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Submission Type ID	Roundtable
Abstract Type	10601
Abstract Title	Roundtable
	Examination of the Hepatitis C Care Cascade and Its Impact on Data Reporting and Health Equity

Abstract

Key Objectives:

- Discuss the current epidemiology and outlook of the hepatitis C Virus (HCV) in the United States.
- Assess qualitative and quantitative data from a large network of community health centers demonstrating gaps in the current HCV care cascade model, specifically safety-net patients deemed “lost to follow-up”, or who do not receive treatment.
- Identify recommendations to improve the HCV care cascade allowing for greater understanding around patients “lost to follow-up” or who did not receive treatment and influences on public health surveillance, data reporting, access to care, policy, and health equity.

Brief Summary:

Background: Hepatitis C (HCV) is the leading cause of liver cancer in the United States. Relatively new treatments for HCV can lead to a sustained virologic response (SVR), preventing morbidity, mortality, and further transmission. Current HCV summary data is adapted from the HIV cascade and includes positivity, treatment, and SVR rates, but the cascade lacks nuance for those considered “lost to follow-up” (LTFU). **Methods:** This mixed methods study combines electronic health record (EHR) data with chart audits to quantitatively analyze HCV disease progression, treatment, and cure. All data comes from a large community health center (CHC) network from 2015-2016; chart audits were conducted on a probability sample of HCV patients deemed LTFU to discover reasons for lack of treatment. De-identified case studies and results from qualitative interviews with CHC providers will also be discussed. **Results:** In a preliminary review of 35 chart audits, nearly all patients determined to be LTFU have discussed treatment options with their primary care provider. Chart audits revealed that patients who were considered LTFU were often referred to a specialist outside of the CHC network for treatment, living with severe comorbidities, be a current substance user, and/or were denied treatment coverage by Medicaid. This project is ongoing and data analysis will be completed and available by June 2018. **Conclusion:** HCV data reported in the format of the HIV cascade lacks nuance and detail around transitions of care and social determinants of health that may impact patients’ treatment and overall health. Recommendations to update the current HCV care cascade may improve the understanding of patients identified as LTFU or who did not receive treatment, providing information impacting public health surveillance, data reporting, access to care, and Medicaid payment policy. This understanding may be vital in guiding both social and medical interventions.

Submission Complete?	Yes
Committee Topic	Infectious Disease
Keywords	Hepatitis
Consider for Different Presentation?	Barriers to Care; Electronic Health Records; Surveillance
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