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Overview of Viral Hepatitis Surveillance, Prevention and Control Activities at the NYC Department of Health and Mental Hygiene in 2013

The New York City Department of Health and Mental Hygiene has been actively engaged in hepatitis surveillance, prevention and control for over a decade; however, 2013 marked a year of heightened focus and commitment for the Department.

Significant advancements in the Hepatitis C (HCV) medical field were followed by new screening recommendations from the Centers for Disease Control and Prevention (CDC) in 2012 and the U.S. Preventative Services Task Force in 2013, as well as new treatment recommendations from the American Association for the Study of Liver Disease. The U.S. Department of Health and Human Services updated its 2011 Viral Hepatitis Action Plan outlining health departments’ roles in combating the viral hepatitis epidemic. In response to the improvements in medical management opportunities, as well as increased resources and national focus, the Health Department developed a strategy to combat hepatitis C in NYC, and implemented a number of hepatitis C-related public health initiatives.

The Hepatitis C Strategic Plan was spearheaded by the Health Department’s Division of Disease Control. A wide cross-section of bureaus and programs contributed to the plan, ensuring an integrated planning approach:

- Bureau of Communicable Disease (BCD)
- Bureau of Immunization (BOI)
- Bureau of HIV/AIDS Prevention and Control (BHIV)
- Bureau of Sexually Transmitted Diseases (BSTD)
- Bureau of Correctional Health Services (CHS)
- Bureau of Alcohol and Drug Use Prevention, Care and Treatment (BADUPCT)
- Bureau of Primary Care Information Project (PCIP)
- Program Collaboration and Service Integration Unit
The Health Department’s prioritization of viral hepatitis was solidified by the creation of the Viral Hepatitis Surveillance Prevention and Control Program (Viral Hepatitis Program, VHP). This new program integrated surveillance and programmatic activities for the first time.

**Strategic Plan for HCV**


The Plan identified three areas of focus: policy, providers and data/surveillance. For each of the Plan’s focus areas, the Department formed a dedicated workgroup to ensure that strategic objectives were carried out.

**The Policy Workgroup** tracked policy and legislative actions that could affect HCV activities and interventions. The group’s activities in 2013 included:

- Planning the NYS Medicaid Redesign with NYSDOH
- Increasing patient awareness of insurer requirements such as prior authorization, pharmacy benefits and other potential barriers to treatment
- Assisting the NYSDOH with the Mandatory HCV Testing Law guidance, implementation and evaluation
- Meeting with managed care organizations on the HCV Strategic Plan and discussing policy and reimbursement structures for hepatitis screening, treatment and management
- Reviewing the Affordable Care Act and identifying policy issues that may have an impact on HCV testing, linkage to care and treatment
- Opposing mandatory mail order pharmacy, which resulted in passage of NYS law A05502
- Created first HCV performance targets for the City’s Take Care New York initiative, an initiative designed to help New Yorkers lead longer and healthier lives.

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1 [https://www.health.ny.gov/diseases/communicable/hepatitis/hepatitis_c/rapid_antibody_testing/](https://www.health.ny.gov/diseases/communicable/hepatitis/hepatitis_c/rapid_antibody_testing/)
The Provider Workgroup assessed the HCV screening, management and treatment needs of NYC providers. The group also worked to increase HCV awareness and education. In 2013, the Provider Workgroup:

- Created a Commissioner's letter promoting HCV screening, diagnosis and treatment
- Delivered the letter to over 35,000 licensed medical providers in NYC

The Data/Surveillance Workgroup focused on improving the hepatitis surveillance system to improve tracking of the HCV epidemic. In 2013 the Data/Surveillance Workgroup:

- Developed plans to require laboratories to report negative HCV RNA test results (at the time, only positive results were reportable), in order to:
  - Better identify people who test positive for HCV antibody but who do not get the recommended RNA test to determine their infection status
  - Test algorithms to identify people on HCV treatment and people who are cured
- Worked on a number of projects described in the surveillance projects section
Hepatitis B and C Epidemiology

The NYC Health Department tracks hepatitis B (HBV) and HCV infection from positive electronic laboratory reports. Routine data includes patient name, sex, date of birth and provider information. Race, ethnicity and risk factors for hepatitis are not routinely reported but may be collected in enhanced surveillance projects. Some examples are discussed in greater detail below. For more comprehensive information on 2013 surveillance activities see the Health Department’s Hepatitis B and C Activities Report, available at [http://www.nyc.gov/html/doh/html/data/cd-hepabc-reports.shtml](http://www.nyc.gov/html/doh/html/data/cd-hepabc-reports.shtml). You can also find and analyze Health Department surveillance data via the online Health Department portal EpiQuery at [https://a816-healthpsi.nyc.gov/epiquery/CDSS/index.html](https://a816-healthpsi.nyc.gov/epiquery/CDSS/index.html).

### Table #1: People Newly Reported with Chronic HBV in New York City, 2013

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Rate per 100,000 People</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>7,558</td>
<td>89.9</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>4,252</td>
<td>106.0</td>
</tr>
<tr>
<td>Female</td>
<td>3,270</td>
<td>74.4</td>
</tr>
<tr>
<td>Transgender</td>
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<td>-</td>
</tr>
<tr>
<td>Unknown</td>
<td>35</td>
<td>-</td>
</tr>
<tr>
<td><strong>Age at time of first report</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-19</td>
<td>232</td>
<td>11.7</td>
</tr>
<tr>
<td>20-29</td>
<td>1,648</td>
<td>117.7</td>
</tr>
<tr>
<td>30-39</td>
<td>1,959</td>
<td>149.5</td>
</tr>
<tr>
<td>40-49</td>
<td>1,523</td>
<td>134.8</td>
</tr>
<tr>
<td>50-59</td>
<td>1,204</td>
<td>112.8</td>
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<tr>
<td>60-69</td>
<td>647</td>
<td>82.7</td>
</tr>
<tr>
<td>70-79</td>
<td>234</td>
<td>53.4</td>
</tr>
<tr>
<td>80+</td>
<td>111</td>
<td>37.8</td>
</tr>
<tr>
<td><strong>Borough of Residence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bronx</td>
<td>970</td>
<td>68.4</td>
</tr>
<tr>
<td>Brooklyn</td>
<td>2,545</td>
<td>98.2</td>
</tr>
<tr>
<td>Manhattan</td>
<td>1,341</td>
<td>82.5</td>
</tr>
<tr>
<td>Queens</td>
<td>1,971</td>
<td>85.8</td>
</tr>
<tr>
<td>Staten Island</td>
<td>139</td>
<td>29.4</td>
</tr>
<tr>
<td>Unknown</td>
<td>592</td>
<td>N/A</td>
</tr>
</tbody>
</table>

2 Differences in data between this report and previous reports may be due to factors such as delays in disease reporting, correction of errors and refinements in data processing (for example, the identification of duplicate reports).
<table>
<thead>
<tr>
<th>Age at time of first report</th>
<th>Number</th>
<th>Rate per 100,000 People</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-19</td>
<td>83</td>
<td>4.2</td>
</tr>
<tr>
<td>20-29</td>
<td>683</td>
<td>48.8</td>
</tr>
<tr>
<td>30-39</td>
<td>1,035</td>
<td>79.0</td>
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<tr>
<td>40-49</td>
<td>1,284</td>
<td>113.6</td>
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<tr>
<td>50-59</td>
<td>1,844</td>
<td>172.7</td>
</tr>
<tr>
<td>60-69</td>
<td>1,291</td>
<td>165.0</td>
</tr>
<tr>
<td>70-79</td>
<td>393</td>
<td>89.7</td>
</tr>
<tr>
<td>80+</td>
<td>209</td>
<td>71.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Borough of Residence</th>
<th>Number</th>
<th>Rate per 100,000 People</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bronx</td>
<td>1,671</td>
<td>117.8</td>
</tr>
<tr>
<td>Brooklyn</td>
<td>1,818</td>
<td>70.1</td>
</tr>
<tr>
<td>Manhattan</td>
<td>1,456</td>
<td>89.5</td>
</tr>
<tr>
<td>Queens</td>
<td>1,238</td>
<td>53.9</td>
</tr>
<tr>
<td>Staten Island</td>
<td>248</td>
<td>52.5</td>
</tr>
<tr>
<td>Unknown</td>
<td>391</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Below are highlights of the 2013 HCV and HBV surveillance data:

Hepatitis B:
• 7,558 people were newly reported with chronic HBV infection.
• 56% were men.
• 84% were aged 20 to 59 years.

Hepatitis C:
• 6,822 people were newly reported with HCV. This includes people who tested positive for the antibody but may have had a negative or unknown RNA test.
• 63% were men.
• 11% were younger than 30 years.
• 50% were born between 1945 and 1965 (“Baby Boomers”).

The Health Department uses routine surveillance data to focus its public health efforts. One such effort is to increase RNA confirmatory testing of HCV antibody-positive people. In 2013, only 50% of people with newly reported HCV antibody-positive results had a positive HCV RNA (confirmatory test) reported within six months of the initial report.

HCV and HBV infection rates vary greatly across New York, as shown in Maps #1 and #2 below. East Harlem in Manhattan and Hunts Point-Mott Haven in the Bronx had the highest rates of HCV infection. Neighborhoods with a high proportion of Chinese American residents—the Lower East Side, Sunset Park and Flushing—have the highest rates of chronic HBV.
Map #1: People Newly Reported with Chronic HCV in NYC by Zip Code, 2012 and 2013

Average annual rate per 100,000 people

- 0.0
- 0.1 - 50.0
- 50.1 - 100.0
- 100.1 - 150.0
- 150.1 - 200.0
- >200.0
Map #2: Newly Reported People with Chronic HBV in NYC by Zip Code, 2012 and 2013

Average annual rate per 100,000 people

- 0.0
- 7.1 - 67.8
- 67.9 - 160.2
- 160.3 - 331.8
- 331.9 - 842.5
In 2008, NYC’s estimated prevalence of chronic HBV infection, based on surveillance data, was 1.2% (range, 1.1–1.4%) or approximately 100,000 people. The prevalence of chronic HCV infection in adults aged 20 years and older was 2.37% (range, 1.53-4.90%) or 146,500 people in 2010.

**HBV and HCV Deaths in 2012**

Nationwide, HCV-related deaths now surpass HIV-related deaths. The Health Department estimates that HCV-related deaths increased 46% from 1999 to 2012, while HBV-related deaths remained fairly stable, as shown in the table below.

**Table #3: Deaths Associated with HBV or HCV as Underlying or Contributing Cause of Death, NYC Residents, 2000 to 2012**

<table>
<thead>
<tr>
<th>Year</th>
<th>Hep B</th>
<th>Hep C</th>
<th>Hep B</th>
<th>Hep C</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>63</td>
<td>174</td>
<td>59</td>
<td>243</td>
</tr>
<tr>
<td>2001</td>
<td>45</td>
<td>217</td>
<td>68</td>
<td>238</td>
</tr>
<tr>
<td>2002</td>
<td>55</td>
<td>251</td>
<td>65</td>
<td>289</td>
</tr>
<tr>
<td>2003</td>
<td>45</td>
<td>222</td>
<td>51</td>
<td>245</td>
</tr>
<tr>
<td>2004</td>
<td>41</td>
<td>264</td>
<td>63</td>
<td>234</td>
</tr>
<tr>
<td>2005</td>
<td>47</td>
<td>253</td>
<td>46</td>
<td>246</td>
</tr>
<tr>
<td>2006</td>
<td>44</td>
<td>256</td>
<td>54</td>
<td>278</td>
</tr>
<tr>
<td>2007</td>
<td>38</td>
<td>276</td>
<td>54</td>
<td>288</td>
</tr>
<tr>
<td>2008</td>
<td>40</td>
<td>286</td>
<td>52</td>
<td>270</td>
</tr>
<tr>
<td>2009</td>
<td>39</td>
<td>309</td>
<td>48</td>
<td>282</td>
</tr>
<tr>
<td>2010</td>
<td>52</td>
<td>260</td>
<td>68</td>
<td>314</td>
</tr>
<tr>
<td>2011</td>
<td>39</td>
<td>289</td>
<td>70</td>
<td>374</td>
</tr>
<tr>
<td>2012</td>
<td>39</td>
<td>303</td>
<td>70</td>
<td>349</td>
</tr>
<tr>
<td>Total</td>
<td>587</td>
<td>3,360</td>
<td>768</td>
<td>3,650</td>
</tr>
</tbody>
</table>

*Data were obtained from the NCHS multiple cause files for years 2000 to 2011. Data for 2012 were obtained from the NYC Office of Vital Statistics (OVS) statistical file. Only includes deaths that occurred in NYC.
2 The disease or condition that set off the chain of events leading to death
3 All those diseases, morbid conditions or injuries which either resulted in or contributed to death

---

Figure #1: Age-adjusted Death Rates of HIV, HBV and HCV in NYC, 1999 to 2012*

Source: Contributing causes of death were obtained from the NCHS Multiple Cause files for NYC except for 2012 which use the OVS statistical file.
Rev. 7/7/14

Data from 1999 to 2011 are from the National Center for Health Statistics (NCHS) Multiple Cause files for NYC. Data for 2012 were from the NYC Health Department statistical file, because data from NCHS were not yet available. Both underlying and contributing causes of death are included. Causes of death were coded using ICD-10. The codes used for HIV are B20-B24; HBV: B16, B170, B180, B181; HCV: B171, B182. Both acute and chronic conditions were included for HBV and HCV. The trends reported in the chart may not be mutually exclusive; a record that contains any mention of HIV, HBV and HCV will be included in each of the trends. Rates were calculated using population estimates based on the Census Bureau interpolated intercensal population estimates 2000 to 2010 for each year and modified according to suggestions made by NYC Department of City Planning. Estimates for 2011 and 2012 are based on U.S. Census Bureau population estimates released June 2013. Age adjustment was performed using the population age categories of 0-24, 25-44, 45-64, 65-84 and 85+ years.
Hepatocellular Carcinoma among NYC Residents

Chronic HBV and HCV increase risk for hepatocellular carcinoma (HCC), which accounts for most liver cancers.¹ NYC neighborhoods with high rates of HCC tend to be those with the highest rates of chronic HBV and HCV.

In 2011, the incidence of liver cancer in NYC men was 16.2 per 100,000, up from 14.3 in 2001. The rate among women increased from 4.1 per 100,000 to 5.5.⁷ There were 628 male HCC cases and 274 female cases in 2011 compared to 472 and 186, respectively, in 2001. Rising HCC rates are alarming since the five-year survival rate at all stages is only 16%.⁸ The five-year average for HCC cases and deaths per 100,000 men and women in New York’s five boroughs are shown in Table #4 below.

Table #4: Hepatocellular Carcinoma Incidence and Mortality for NYC by Borough, 2007-2011 Average

<table>
<thead>
<tr>
<th>Site of Cancer</th>
<th>Incidence</th>
<th></th>
<th></th>
<th>Mortality</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
<td>Men</td>
<td>Women</td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td></td>
<td>Average Annual Cases</td>
<td>Rate per 100,000</td>
<td>Average Annual Cases</td>
<td>Rate per 100,000</td>
<td>Average Annual Deaths</td>
<td>Rate per 100,000</td>
</tr>
<tr>
<td>Total in NYC</td>
<td>661.0</td>
<td>17.8</td>
<td>260.4</td>
<td>5.4</td>
<td>397.2</td>
<td>11.1</td>
</tr>
<tr>
<td>Bronx</td>
<td>146.0</td>
<td>26.6</td>
<td>55.0</td>
<td>7.5</td>
<td>82.6</td>
<td>15.6</td>
</tr>
<tr>
<td>Brooklyn</td>
<td>172.6</td>
<td>16.0</td>
<td>67.6</td>
<td>4.8</td>
<td>105.4</td>
<td>10.1</td>
</tr>
<tr>
<td>Manhattan</td>
<td>146.6</td>
<td>19.2</td>
<td>57.2</td>
<td>5.8</td>
<td>89.4</td>
<td>12.0</td>
</tr>
<tr>
<td>Queens</td>
<td>158.6</td>
<td>14.7</td>
<td>66.6</td>
<td>4.9</td>
<td>98.6</td>
<td>9.5</td>
</tr>
<tr>
<td>Staten Island</td>
<td>37.2</td>
<td>15.2</td>
<td>14.0</td>
<td>4.9</td>
<td>21.2</td>
<td>9.4</td>
</tr>
</tbody>
</table>

Figure #2: Liver Cancer Incidence and Mortality by Year, NYC, 1976-2011
Surveillance Projects

HCV RNA Confirmation Project
People who test positive for HCV antibody might be infected, or they might have naturally resolved their infection. RNA testing is needed to determine current infection status. However, one Health Department study showed that 33% of people with a positive HCV antibody result did not get the recommended RNA test, even after Department staff reminded clinicians to do it.\(^9\) The Department’s “It Takes Two” project was started to remind providers to order RNA tests for their antibody-positive patients.

In 2013:
- Project staff mailed out letters to clinicians for over 2,800 patients to request that they order the RNA test if it had not been done. A short survey about the usefulness of the enclosed material was included.
- Average response rate to the survey was 30%. Of those who responded:
  - 55% found the reminder helpful;
  - 60% wanted more such reminders in the future.
- However, the rate of RNA testing improved only slightly.
  - Among people newly reported with HCV in 2012, 48% had a positive RNA result reported to the surveillance system within six months.
  - Among people newly reported in 2013, the percentage rose to 50%.

Negative HCV RNA Reporting
As of 2013, negative HCV RNA results were not reportable in NYC. This limited the Health Department’s ability to know which antibody-positive patients did not have chronic HCV infection and which still needed RNA testing. As a result, the Department launched the Negative HCV RNA Reporting initiative. The goals of the initiative are to: 1) identify people who have a positive HCV antibody test but have not received the recommended RNA test and 2) develop algorithms to estimate the proportion of people with chronic HCV who are on treatment and the proportion cured.

In 2013, the Health Department took steps to mandate both negative and positive HCV RNA test results. This change took effect on July 21, 2014. The Health Department’s Electronic Clinical Laboratory Reporting System and surveillance databases were updated to receive negative HCV RNA reports from laboratories.

Enhanced Surveillance Projects

HCV among Children and Young Adults in NYC
The Health Department wanted to see if New York City mirrored national trends in prescription opioid misuse, injection drug use and HCV infection. The Department analyzed routine HCV surveillance data among people up to 30 years old from 2009 to 2013 and asked clinicians for information from a sample of their young patients. Cases investigated included all 0 to 21 year-olds newly reported with HCV, and a random 50% sample of 22- to 30-year-olds with newly reported HCV diagnoses in 2013.

Between 2009 and 2013, 4,811 people under 30 were newly reported to the NYC Health Department with HCV. For those 26 years and older, the rates of new HCV reports were higher in the high-poverty and very-high-poverty census tracts than they were in the low- and medium-poverty census tracts.

In contrast, for younger age groups, rates in low and medium poverty census tracts were similar to or higher than rates in higher-poverty census tracts. The geographic distribution of cases in people aged 30 years and younger versus the “Baby Boomer” group (those born between 1945 and 1965) is shown in Map #3 below. For additional details, see Hepatitis C Surveillance among Youth and Young Adults in New York 2009-2013, by C. Prussing, K. Bornschlegel and S. Balter in the Journal of Urban Health (December 2014). Key findings from the study are also presented below.

**Map #3: HCV Rates by United Hospital Fund Neighborhood and Age Groups, 2009-2013**

### 0-30 Year-Olds

**Average annual rate per 100,000 people**

- 7.4-16.7
- >16.7-20.6
- >20.6-24.9
- >24.9-29.5
- >29.5
Key findings from the case investigations were:
- The highest percentage of cases was among non-Hispanic Whites.
- Among those aged 18 to 30 years, injection drug use (mostly heroin) was the most commonly identified risk factor, followed by intra-nasal drug use.
**HBV in Children**

HBV infection in children in the U.S. is rare because of two very successful interventions. Perinatal transmission is usually prevented through universal prenatal screening of pregnant women, coupled with provision of immune globulin and vaccinating the baby, on the day of birth, if the mother has HBV. Pediatric infection is otherwise prevented through routine infant vaccination of all children, regardless of the mother’s infection status.

Despite these prevention programs, the Health Department continues to receive reports of chronic HBV among children up to 18 years old. Department staff investigated factors associated with pediatric HBV infection and looked specifically for missed vaccination opportunities and vaccine failures.

Using data from the Health Department’s HBV surveillance program, researchers selected a sample of children born in 1992 or later. Children known to have been born to HBV-positive women (i.e., if they were reported to the Health Department’s Perinatal HBV Prevention Program) were excluded. After preliminary investigation, 20 of 70 randomly selected patients were found to be duplicates (n=6), or not infected with HBV (n=14). This left 50 cases in the analysis dataset.

The main findings are shown in Table #5 below. Most children newly reported with chronic HBV were recently arrived foreign-born who were already infected with HBV prior to entering the U.S. Half of the children were born in China; four were born in the U.S. The remaining children with known country of birth were born in countries with intermediate or high HBV prevalence. Among 28 immigrant children for whom immigration information could be obtained, 71% arrived in the U.S. in 2012, and 71% were older than 10 at the time of immigration.
<table>
<thead>
<tr>
<th>Characteristics of Children Reported with Chronic HBV, January 2012 to June 2013</th>
<th>Frequency (N=50)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;= 4</td>
<td>3</td>
<td>6.0</td>
</tr>
<tr>
<td>5 to 10</td>
<td>11</td>
<td>22.0</td>
</tr>
<tr>
<td>11 to 14</td>
<td>16</td>
<td>32.0</td>
</tr>
<tr>
<td>15 to 18</td>
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<tr>
<td><strong>Gender</strong></td>
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<tr>
<td>Female</td>
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<tr>
<td><strong>Borough of residence</strong></td>
<td></td>
<td></td>
</tr>
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</tr>
<tr>
<td>Queens</td>
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<td>Manhattan</td>
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<td></td>
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<tr>
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<td>Other high endemic countries</td>
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<tr>
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<td>7</td>
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</table>

*High endemic countries are those with HBsAg prevalence >=8%. Intermediate endemic countries are those with HBsAg prevalence >=2% and <=7%
Hepatitis A and B Vaccination

The Health Department provides HBV vaccinations to at-risk patients in its Bureau of Sexually Transmitted Disease (BSTD) clinics and to patients 4 years and older in Bureau of Immunization (BOI) clinics. In 2013, the Health Department provided the following vaccinations:

- 5,466 doses to children aged 4 to 18 in Health Department BOI clinics located in Fort Greene, Corona and Tremont
- 9,033 doses at BOI clinics to adults 19 or older, of which 3,531 were the third in a three-dose series
- 4,439 doses in BSTD clinics in Central Harlem, Chelsea, Corona, Crown Heights, Fort Greene, Jamaica, Morrisania and Riverside facilities, of which 555 were the third in a three-dose series

The Health Department also offers vaccinations for hepatitis A to at-risk patients in its BSTD clinics and to at-risk adults older than 19 in its BOI clinics. In 2013 the Health Department provided the following hepatitis A vaccinations:

- 2,574 doses in the three BOI clinics, of which 1,064 were the second in a two-dose series
- 1,265 doses in eight BSTD clinics, of which 372 were the second in a two-dose series
- 1,660 Hepatitis A/B combined vaccine doses in BSTD clinics, of which 228 were the third in a three-dose series

HBV Vaccination among Adults

In 2012, the Health Department received a grant through the CDC’s Prevention and Public Health Fund to reduce acute HBV infection among adults in high-risk settings and among adults whose behaviors put them at increased risk of HBV infection.

The grant's focus is to increase HBV vaccination, health education and patient reminder/recall in facilities and institutions where high-risk individuals congregate. These sites include NYC correctional facilities, including Riker's Island, the Morrisania STD clinic in the Bronx, three community-based immigrant health facilities in lower Manhattan, Harlem and Flushing and a harm reduction facility in Downtown Brooklyn. The Bureau of Tuberculosis Control facility at Morrisania also provides vaccination referral to its patients at risk of HBV exposure and infection.

The funding provided qualitative data useful to future HBV educational activities. In particular, BOI and BSTD staff held focus groups among U.S.-born, foreign-born and Spanish-speaking residents to assess HBV morbidity and mortality risk perceptions. They also looked for the best ways to promote vaccination.

Information from the focus groups was used to increase vaccinations in high-risk, foreign-born populations.
Perinatal HBV Prevention

Preventing perinatal HBV transmission is critical. There is a 90% chance that a child born to an HBV-infected woman will become infected with the virus unless preventive measures are taken. The development of chronic HBV in newborns infected at the time of birth is nine times higher than in people infected as adults.

The Health Department’s Perinatal HBV Prevention Program is responsible for the surveillance and case management of HBV-infected pregnant women and their infants. The Perinatal Program receives reports of HBV-positive pregnant and post-partum women. In 2013, a reported 1,598 HBV-infected women delivered in NYC. Of this group, 149 women were treated with anti-viral medication at the time of delivery. Additional perinatal HBV reporting information for 2013 can be seen in Table #6 below.

Table #6: NYC Perinatal HBV Surveillance Activities

<table>
<thead>
<tr>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>HBV-positive pregnant women reported in 2013</td>
<td>1,802</td>
</tr>
<tr>
<td>Infants born to HBV-positive mothers in 2012</td>
<td>1,852</td>
</tr>
<tr>
<td>Infants born in 2012 who completed the HBV vaccine three dose series and HBV testing</td>
<td>1,442</td>
</tr>
</tbody>
</table>

Results of infant testing (n=1442)

<table>
<thead>
<tr>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infected</td>
<td>9</td>
</tr>
<tr>
<td>Immune</td>
<td>1,381</td>
</tr>
<tr>
<td>Susceptible</td>
<td>31</td>
</tr>
<tr>
<td>Indeterminate</td>
<td>21</td>
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</table>
HCV Screening and Linkage to Care

“Check Hep C NYC” Program

The Health Department launched the Check Hep C program in 2012 as a one-year demonstration project that aimed to increase HCV screening, diagnosis, linkage to care and treatment in NYC. The program funded HCV point-of-care antibody testing, HCV RNA testing performed immediately after reactive antibody test; HCV patient navigation services including linkage to care and care coordination services; and tele-medicine training opportunities for affiliated HCV clinical providers. In order to recruit patients to the program, the Health Department produced an awareness campaign to encourage testing and treatment.

The Department also funded programs serving people in high-prevalence communities and programs serving patients with active or former injection drug use. In total, Check Hep C funded eight organizations to provide services at 12 sites. Four sites were Federally Qualified Health Centers, six were Syringe Exchange Programs and two were a combination of both.

Program staff enrolled and tested 4,751 individuals from May 2012 to April 2013.
- 880 patients were anti-HCV positive.
- 678 (77%) received an RNA confirmatory test.
- 512 (76%) were RNA positive (i.e. HCV infected).

The overall HCV infection prevalence was estimated at 14%. Participants who had an RNA test did not differ in terms of age, race/ethnicity, gender, risk characteristics or history of HCV testing from those who did not have an RNA test. The HCV infection rate was 5.8 times higher in the Check Hep C project population than the estimated prevalence for NYC overall (2.4 %). 10

Most (80% of) Check Hep C participants with chronic HCV attended a first medical appointment. Those enrolled at Federally Qualified Health Centers were most likely to attend their first medical appointment. Over half of HCV-infected participants who attended their first medical appointment were accompanied to their visit by a patient navigator.

Twenty-seven percent of the 157 HCV-infected patients who attended a medical appointment at Check Hep C Federally Qualified Health Centers were deemed treatment candidates. The most common reasons for which participants were designated as not being candidates for treatment were: disease comorbidities (including psychiatric contraindications), absence of liver fibrosis, and persistent or unmanaged alcohol or drug use. In 2013, many providers and patients were waiting for the soon-to-be-released more effective HCV treatments which had fewer side effects than the challenging interferon-based regimens available for the last decade.

The Check Hep C program was successful in identifying people at risk for HCV, providing complete diagnostic testing and linking HCV-infected individuals to care. Achievements and lessons learned from this demonstration project were used to streamline and enhance the program for the second year of funding, which began in 2014.

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10 Ford, M et al. “Check Hep C: A community-based approach to Hepatitis C diagnosis and linkage to care in high-risk populations” – manuscript in preparation
CDC Testing Grant for People Who Inject Drugs
In 2012, the CDC’s Prevention and Public Health Fund awarded a grant to the Health Department to start viral hepatitis testing and promote earlier identification of people with HCV among medically underserved populations disproportionately affected by the infection. The grant’s goals were to increase the number and proportion of injection drug users who tested for HCV, were aware of their infection status and were linked to care, treatment and prevention services.

The program funded organizations that operate in East Harlem, the South Bronx and Brooklyn, neighborhoods with the highest number of reported cases of HCV infection.

From February 2013 to December 2013, 1,263 people received an HCV-antibody test, and 39% tested positive. Of those who tested antibody-positive, 208 were tested for HCV RNA and 147 were RNA-positive. Ninety seven of 147 people (66%) were referred to care.
Program Collaboration and Service Integration Initiative

The Program Collaboration and Service Integration Initiative is a CDC effort to connect activities of HIV, Sexually Transmitted Disease (STD), tuberculosis and viral hepatitis programs. Staff are housed in the Office of the Deputy Commissioner, Division of Disease Control and work collaboratively with disease-specific programs, other health department partners and external stakeholders. The initiative’s aim is to coordinate these programs and related Health Department programs serving populations at risk for HIV, STDs, tuberculosis and viral hepatitis. The aim is met by increasing data sharing and integration, connecting services for people with or at risk of the conditions listed above and strengthening collaboration and coordination among these programs. Program staff completed a data match in 2012 with HIV, STD, tuberculosis, HCV, HBV, mortality, diabetes (hemoglobin A1C) and vital statistics death data from 2000 to 2010. Findings are used to inform program planning, educate community partners and support funding efforts.

Strengthening Sexual Health Screening at Federally Qualified Health Centers

The Program Collaboration and Service Integration Initiative collaborated with BHIV, Viral BSTD and PCIP to strengthen screening for selected infectious diseases at FQHCs in NYC. The project, in its second year, aims to help six participating Federally Qualified Health Centers (FQHCs) increase HIV and HCV testing and increase the number of patients taking recommended treatment for gonorrhea.

The Health Department provided technical assistance focusing on: 1) making sexual health screening routine policy and integrating screening into clinical practice; 2) modifying workflows to integrate screening; 3) improving electronic health record use to streamline screening and track performance; and 4) training providers on best practices and recommendations.

In 2013, project staff provided 19 on-site trainings on HIV testing, HCV and STD screening, reaching over 350 FQHC providers and staff, and reported on the status of data from FQHCs’ electronic health records at in-person meetings.

- 100% of participating FQHCs revised their institutional protocols or processes to integrate screening into clinical practice.
- 83% of FQHCs made EHR enhancements and modified workflows to streamline documentation and integrate routine screening.
The Bureau of Correctional Health Services (CHS) aims to improve the health and well-being of people who live in the NYC jail system. In June 2013, CHS (following United States Preventive Services Task Force recommendations) changed its policy to systematize HCV screening upon intake for inmates born between 1945 and 1965. Also starting in 2013, CHS’s Transitional Health Care Coordination program, which ensures that HIV-positive patients leaving Riker’s Island are connected with outside care and services, began to provide this service to HIV/HCV co-infected people who had been tested while in jail and to those already on antiviral treatment for HCV.

As shown in the graph below, the implementation of routine screening more than doubled the number of HCV antibody tests performed from 375 (January to May, 2013) to 946 (July to December).

**Figure #3:** 2013 Total Hepatitis C Antibody Testing, NYC Jails
Community Capacity-Building and Awareness

The Health Department organizes the NYC Hep C Task Force and NYC Hep B Coalition. Together these groups form a citywide network of professionals and patient advocates from a wide range of public, private and government organizations. The network serves to identify, organize and disseminate community activities and resources, as well as identify community needs and develop collaborative strategies to meet needs. Participation takes place through in-person general meetings and task-oriented committees or workgroups, as well as online through email, a website (hepfree.nyc), and social media platforms on Facebook, Twitter and LinkedIn. Active community engagement with all sectors of the hepatitis field provides valuable opportunities to seek feedback, expert guidance and support for Health Department initiatives.

The NYC Hep C Task Force’s mission is to build community capacity for the effective prevention, screening, management and treatment of HCV by promoting collaboration among key stakeholders and effecting change through participation in policy advancement, initiating innovative projects and knowledge-sharing. The Task Force was founded in the South Bronx in 2004 and has since expanded to all five boroughs of NYC. Meetings occur approximately two times per year in each borough.

The NYC Hep B Coalition’s mission is to coordinate efforts to prevent, manage and reduce HBV among all NYC residents. The coalition seeks to foster collaboration among all stakeholders to advance awareness of HBV, increase participation in screening and vaccination, and improve access to care and through education, outreach, advocacy and the support of research. The NYC HBV Coalition was founded in 2009 and meets quarterly.

In 2013, these groups held 12 in-person general meetings, with more than 400 attendees. In addition, there were 40,036 visits to the coalition website, with 7,120 unique visitors, more than 300 Facebook followers, more than 250 LinkedIn Group members, 400 Twitter followers and 2,000 email newsletter subscribers.

2013 NYC Hep C Task Force and Hep B Coalition Achievements

- Supported the founding of Team HBV NYC, a local chapter of the national Team HBV Student Initiative
- Developed and conducted bi-monthly meetings of the Hep Health Care Access Workgroup with a Hep B and C Patient Navigator Network sub-committee
- Conducted the 4th Annual HEP Health Care Access Training in partnership with Centers for Medicaid and Medicare Services (CMS)
- Through the African Hep B and C Committee, developed and piloted several HBV patient education materials including the prototype for the “Hep B Vaccine: Complete the three-dose series” pocket card in English and French and a Hep B Screening Radio PSA in French
- Held the third Annual Coalition Against Hepatitis in People of African Origin (CHIPO) NYC Community Forum
- Coordinated and planned the National Hepatitis Testing Day and Hispanic Hepatitis Awareness Day commemorations on the steps of NYC’s City Hall
- Coordinated World Hepatitis Day in Times Square, which received press coverage and Guinness Book of World Records title
- Awareness Day Commemoration
  - First-ever African American Hep C Action Day
  - World Hepatitis Day event in Times Square with over 100 participants
Viral Hepatitis Training, Outreach and Community Organizing

Outreach
The Health Department conducts regular outreach to organizations serving people at risk for or infected with HBV and HCV through providing training, presentations and participating in related community coalitions and networks. Since 2008, the Department has issued a monthly email newsletter to over 2,000 community partners. The newsletter provides information on upcoming events, conferences and trainings, news, policy alerts, new tools and resources, funding opportunities, jobs, policy and advocacy updates, new publications, reports and recommendations and opportunities to provide feedback.

Training
The Health Department provides training on viral hepatitis A, B and C, and related issues such as HCV Rapid Testing, linkage to care, and health care access to a wide range of service providers throughout NYC. In 2013, the Department trained over 400 people on the following topics:

1. Understanding Hepatitis A, B and C – four-hour Credentialed Alcoholism and Substance Abuse Counselor (CASAC) accredited training provided at NYC hepatitis community program sites
2. Hep-SBIRT: a standardized Substance Abuse Brief Intervention and Referral for Treatment tailored for viral hepatitis patients
3. Annual Hepatitis Health Care Access Training co-organized by the Centers for Medicaid and Medicare Services
4. Annual HCV Clinical Trials Training
5. HCV Patient Navigator trainings for grant-funded programs and community partners
6. Viral Hepatitis 101 Trainings through the Health Department Training and Technical Assistance Program
7. Hep C Rapid Test Training through the Training and Technical Assistance Program

The Department recruits training participants to join its hepatitis coalitions and subscribe to its monthly newsletter to receive ongoing information, resources and opportunities.

NY HCV Research Consortium
The NYC HCV Research Consortium was founded to facilitate sharing of HCV-focused research in NYC. It is the first and only HCV-specific research consortium of its kind in the U.S. The third Research Consortium occurred on September 26, 2013 in NYC. A compendium of abstracts from the Consortium can be found here: http://hepfree.nyc/2014-nyc-hcv-research-consortium/
2015 Strategic Goals

In 2014, the Health Department continued to implement the HCV Action plan and work on HBV activities. As the 2014 annual report will describe, the Department made significant progress toward its 2013 goals. Goals for 2015 have been updated and are listed below.

**HCV Strategic Goals**
1. Increase clinical provider knowledge and capacity for screening, diagnosing, managing and treating HCV infection in NYC
2. Increase HCV screening, diagnosis and linkage to care
3. Increase the usefulness of surveillance data
4. Promote primary prevention
5. Enhance public awareness of HCV
6. Advance HCV public health policy

**HBV Strategic Goals**
1. Monitor and report on HBV health disparities, disease and epidemiological patterns
2. Educate and develop the capacity of providers serving high-risk populations to improve HBV screening and linkage to care
3. Educate policymakers on the importance of HBV and its impact on the community
4. Promote policies and practices to eliminate perinatal transmission
5. Promote primary prevention
6. Seek funding for HBV surveillance, programs and services for adults with HBV infection
Appendix

**Surveillance Publications**

Hepatitis C Surveillance among Youth and Young Adults, NYC 2009-2013. C. Prussing, K. Bornschlegel and S. Balter, J Urban Health 2014 Dec (epub ahead of print)
- Described the epidemiology of people aged 0 to 30 years who are newly reported with HCV in NYC

- Described patterns of duplicative and unnecessary HCV antibody testing

- Evaluated enhanced chronic HCV surveillance in NYC and found that while conducting enhanced HCV surveillance requires significant resources, investigating a representative sample provides detailed information about NYC's HCV population.

- Through an analysis of surveillance data researchers estimated the prevalence of HCV infection in adults aged >20 years in NYC at 2.4% or 146,500 cases.

- Using census-based and surveillance-based estimates, Health Department researchers estimated the prevalence of chronic HBV infection in NYC at 1.2% or 100,000 people.

- Sought to determine the impact of discontinuing provider reporting for chronic HBV and HCV, hepatitis A and select enteric diseases. The study found that labs reported more cases and their reports were timelier and more complete for all categories except race/ethnicity.

- This project found that one third of patients reported to the surveillance system did not receive an RNA test to determine infection status, even after health department staff reminded clinicians that such testing is recommended.
- An outbreak of 12 clinic-associated HCV virus transmissions was traced to unsafe handling of multidose anesthetic vials and possible re-use of contaminated needles. This report captures the types of outbreaks that continue to occur despite safe injection guidelines.

- Researchers conducted a case-control study to assess the contribution of healthcare exposures to the burden of new infections in the U.S. and found that healthcare exposures may represent an important source of new HBV and HCV infections among older adults.

- Researchers surveyed anesthesiologists about their medication injection safety knowledge and practices. Unacceptable or high-risk injection practices were found to be common among respondents despite widespread knowledge regarding injection-contamination mechanisms.

Perinatal HBV Publications and Presentations

- Evaluated the timeliness, sensitivity of reporting methods, data quality and acceptability of the survey system. Found that among the 1,722 HBV-infected pregnant women who delivered between October 2011 and September 2012, 57.8% were reported prenatally, 67.4% were reported at time of delivery, and 82.8% were reported by the Newborn Metabolic Screening Form (NMSF) -- a diagnostic test conducted one or two days after birth at the hospital that uses dried blood spots to check for a number of rare disorders. NMSF was the only source of report for 10.5% of cases. Missing data elements included diagnosis date of HBsAg positivity (0.6%), initial source of report (2.1%) and birth country (8.5%).

“An Assessment of Case Surveillance Completeness for Hepatitis B in Pregnancy” Julie E. Lazaroff, MPH; Katelynn Devinney, MPH; Jennifer Rosen, MD; Christopher M. Zimmerman, MD, MPH and Jane R. Zucker, MD, MSc
- Study objective was to ascertain the completeness of Hep B-Pregnancy case assessment by NYC Health Department PHBP Unit Surveillance System. Capture-recapture analysis demonstrated that the completeness of the surveillance system is very high (96.5%) but could be improved; and that the missing cases from the dataset were likely due to the limitation of the exact match algorithm used for comparing the Citywide Immunization Registry (CIR)/Electronic Clinical Laboratory Reporting System (ECLRS) dataset to the PHBP surveillance database (PHBP-DB) dataset. Development of a more complex matching algorithm is recommended for future studies.
• Presented at the NYC Epidemiology Forum, February 28, 2014

“Perinatal Hepatitis B Prevention – Hospital Policy and Practices Survey”
Katelynn Devinney, MPH, Julie Lazaroff, MPH, Jennifer Rosen, MD, Jane R. Zucker, MD, MSc
• Evaluated the policies and procedures utilized by NYC birthing facilities for perinatal HBV prevention to assess adherence to requirements, national/NYS standards and recommendations via a survey. Of the 40 practices surveyed, 35 were OB/GYN Departments. Among the 35 OB/GYN Departments, 97.1% indicated that they review the HBsAg test results for all women admitted to labor and delivery units; 5.7% indicated they test all women for HBsAg regardless of previous testing; and 100% indicated that they test all women for HBsAg if their status is unknown or missing.
• Conclusions: Facilities appear to be following most perinatal HBV prevention policies and recommendations; however, facilities could do more to prevent perinatal HBV transmission.
• Presented at the NYC Epidemiology Forum on February 28, 2014

Program Collaboration and Service Integration (PCSI) Publications

“Matching New York City Viral Hepatitis, Tuberculosis, Sexually Transmitted Diseases and HIV Surveillance Data, 2000-2010” Epi Research Report, NYC Department of Health and Mental Hygiene (October 2013)
• After matching, 840,248 unique people were identified as having at least one of the seven diseases. The number of people with each disease ranged from 11,875 with TB to 366,409 with chlamydia. Though most individuals had only one disease (87%), 13% had multiple diseases.
• About one in six New Yorkers with HIV was co-infected with HCV (16%).

• Cross-matched NYC TB and viral hepatitis surveillance data were used to estimate the proportion of NYC adults diagnosed with TB from 2000 to 2010 with a report of viral hepatitis infection and to describe the impact of viral hepatitis infection on TB treatment completion and death.
• For 9,512 TB patients, HCV infection was reported in 4.2% and HBV infection in 3.7%; <1% of TB patients had both HCV and HBV infection.
• http://www.ncbi.nlm.nih.gov/pubmed/25387450

• Surveillance data was used to describe the prevalence and characteristics of individuals in NYC co-infected with HIV and HBV and/or HCV. Of 140,606 people reported with HIV, 4% were co-infected with HBV only, 15% were co-infected with HCV only, and 1% were co-infected with HBV and HCV.
• In all groups, 70-80% were male. The most common race/ethnicity and HIV transmission risk groups were: non-Hispanic blacks and men who have sex with men for HIV/HBV infection; and non-Hispanic black, Hispanics and injection drug users for HIV/HCV and HIV/HBV/HCV infection.
• http://www.ncbi.nlm.nih.gov/pubmed/25170631
- HCV-infected adults were at increased risk of dying and of dying prematurely, particularly from conditions associated with HCV such as HIV/AIDS or drug use. The short interval between HCV report and death suggests a need for earlier testing and improved treatment.
- Results from the analysis are presented in Table #7.

### Table #7: Association between Cause-Specific Death rate and Reported HCV and HIV Infection Status, NYC, 2000–2011 *

<table>
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<tr>
<th>Cause of Death</th>
<th>HCV Monoinfected vs Neither</th>
<th>OR</th>
<th>95% CI</th>
<th>HCV/HIV Coinfected vs Neither</th>
<th>OR</th>
<th>95% CI</th>
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</thead>
<tbody>
<tr>
<td>Liver cancer</td>
<td></td>
<td>9.2</td>
<td>8.6–9.9</td>
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<tr>
<td>Drug-related</td>
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<td>4.0–4.6</td>
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<td>3.1</td>
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<tr>
<td>Cirrhosis</td>
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<td>3.4–4.0</td>
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<tr>
<td>Diabetes/obesity</td>
<td></td>
<td>0.8</td>
<td>0.8–0.9</td>
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<td>Cardiovascular</td>
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<td>0.7–0.7</td>
<td></td>
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<tr>
<td>Nonliver cancer</td>
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<td>0.5–0.5</td>
<td></td>
<td>0.2</td>
<td>0.2–0.2</td>
</tr>
</tbody>
</table>

**Abbreviations:** CI, confidence interval; HCV, HCV virus; HIV, human immunodeficiency virus; OR, odds ratio.

*Logistic regression model adjusted for age at death, race/ethnicity, sex and year of death
Authors:
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