BENEFITS OF FUNDING CHRONIC HEPATITIS B AND C SURVEILLANCE: NYC’S EXPERIENCE

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OUTLINE

- Background on chronic hep B and C
- NYC’s surveillance and data systems

Uses of the data:

- Needs assessment → Outreach
- Enhanced Surveillance: HBV, HCV
- Prevalence estimates: HBV, HCV
- Healthcare-associated HBV/HCV infections
- Future possibilities
BACKGROUND

- Chronic hep B and C are leading causes of severe liver disease (develops over 10, 20, 30 years)
- NYC: 8.3 million people, many immigrants, various high-risk populations
- Large Health Department with 6,000 staff
- Hep B and C surveillance is challenging:
  - high caseload, but limited funding
  - many reports per patient – we needed a new data to link and manage the data
- Recent IOM report and HHS Guidelines
- New Hep C treatment options
USES OF HEP B AND C SURVEILLANCE DATA:

- Describe the epidemiology of chronic hep B and C
- Identify unmet needs
- Help describe the magnitude of the epidemic
- Provide data for action
- Determine how best to use limited resources
CDC Funding for Hepatitis Surveillance at the NYC DOHMH

- Since 2001 (ELC, EIP, etc), increased over time
- Currently:
  - 5 fulltime grant-funded staff and 2-4 paid interns
  - 2 clerical staff
  - Training, postage, translation (phone/print), travel
  - (Acute Hep A, B and C)
- Additional staff, funded by other means:
  - 1 Project coordinator
  - 1 CSTE Fellow
  - Many other staff working part-time on hep B/ C
BASIC SURVEILLANCE AND DATA SYSTEMS

- Beginning in 2001, we developed hep B and C surveillance databases
- Entered >40 boxes of reports
- Created automated de-duplication procedures
- NY State Health Dept developed Electronic Clinical Lab Reporting System (ECLRS)
- In 2006, NYC mandated labs report via ECLRS
- Automation was key to coping with volume of reports
- Requires highly skilled staff
SURVEILLANCE REPORTS AND DATABASES

- In NYC, hep B & C prevalence are both high
- In 2011, 91% of reports were received electronically and imported into our surveillance databases electronically.
- Automation has increased gradually over time

<table>
<thead>
<tr>
<th></th>
<th>Hep B</th>
<th>Hep C</th>
</tr>
</thead>
<tbody>
<tr>
<td># reports received in 2010</td>
<td>94,000</td>
<td>83,000</td>
</tr>
<tr>
<td># newly-reported persons in 2010</td>
<td>10,344</td>
<td>10,846</td>
</tr>
</tbody>
</table>
DEDUPLICATION / LINKING

- People with chronic hep B and C get many tests
  - Can be reported to the health department several times per year, for many years
  - Appropriate testing
  - Inappropriate testing

- Our systems **link** together all reports for each person, creating a longitudinal record

- (Most) deduplication is done automatically – no manual input needed
  - A small number of possible matches require manual review (grey area)
USES OF SURVEILLANCE DATA
DATA SHARING

- Biannual Hep ABC Surveillance Report
- Share our findings at conferences and in peer-reviewed publications
- Data for Action
NEWLY REPORTED PATIENTS WITH HCV, 2008 AND 2009, BY ZIP CODE
Hep B and C Needs Assessments, 2006

Phone interviews with a sample of persons newly reported to our surveillance system.

Many persons reported with Hep B or C needed:
- Notification about positive test result
- Basic information about Hep B or C
- Vaccination against Hep A and B
- Counseling to avoid alcohol
- Counseling to avoid transmitting the virus
- Support groups
Unmet Needs Among People Reported With Hepatitis C, New York City

Katherine Bornschlegel, MPH; Kelly J. Crotty, MD, MPH; Sara Sahl, MPH; Sharon Balter, MD

Objective: This project sought to describe unmet needs among patients reported with hepatitis C in New York City. Design: From the New York City Health Department’s hepatitis C surveillance database, we randomly selected patients whose positive hepatitis C test was in April or May 2005. In 2006, we

KEY WORDS: education, hepatitis C, New York City, secondary prevention, support group, surveillance, unmet needs

Hepatitis C virus is the most common chronic blood-borne infection in the United States and is a leading

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INFORMATION BOOKLETS FOR PEOPLE WITH CHRONIC HEP B OR C

- Based on findings of the needs assessment interviews
- Contents:
  - Basic information about hep B or C
  - Information about the lab tests
  - How to protect the liver / decrease the chance of serious liver disease
  - Advice to see clinician – even if well
  - Advice to avoid alcohol
  - Places to get hep A and B vaccine (free)
  - Counseling to avoid transmitting the virus to another person
Hepatitis B and Pregnancy

- Hepatitis B can be spread from mother to child during pregnancy and childbirth.

- All pregnant women in the U.S. should be screened for Hep B using a test called the hepatitis B surface antigen test.

- If you have Hep B, there are medicines that can help prevent your baby from getting Hep B.

- All women who are pregnant and have a positive Hep B test can receive help from the NYCDOHMH Hepatitis B Perinatal Program to prevent their baby from getting Hep B. For more information please call them at: (718) 520-8245.

- All newborns should get the full Hep B vaccine series even if the mother does not have Hep B.

- If your baby is infected with Hep B, there is a high risk of developing a chronic infection.
DISTRIBUTION OF BOOKLETS

See poster # xxx

1. Free, by calling 311, NYC’s info line
2. Mail to patients newly-reported with hep B or C
OUTREACH TO PATIENTS

- Mail educational booklets to persons newly-reported to the surveillance system
- 15,000-18,000 annually (Hep B and Hep C)
- Wait 6-8 weeks to allow time for clinician to inform patient about positive test result
- Cover letter informs of positive test result, advises to see clinician with questions, and provides Health Dept staff phone numbers
HOW TO TELL OTHERS

- Contact notification can help reduce Hep B transmission and find people who have undiagnosed Hep B
- Health Department does not routinely notify Hep B contacts.
- Provider survey: Chinese American Medical Society and Charles B Wang Health Center
  - 92% said a contacts booklet would be helpful
- Can be ordered in bulk from 311
**INVESTIGATING CHRONIC HEP B AND C**

<table>
<thead>
<tr>
<th></th>
<th>HBV</th>
<th>HCV</th>
</tr>
</thead>
<tbody>
<tr>
<td># reports received in 2010</td>
<td>94,000</td>
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<tr>
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<td>10,846</td>
</tr>
</tbody>
</table>

- Cannot investigate all newly-reported persons
  - Follow-up by mailing the health education booklets
- 10% sample = 1,000 hep B + 1,000 hep C / year
- Many of these patients are very hard to locate
  - Immigrant groups, Drug users
SAMPLING:
ENHANCED CHRONIC HEP B AND C SURVEILLANCE

- Began in 2008
- Investigate a **sample** of newly-reported patients
  - Simple random sampling
  - Information from clinicians by fax, etc.
  - Information from patients by phone, etc.
- 120 per year – small sample size ensures we have adequate staffing to collect complete information
- Student interns and general staff
- Findings:
Enhanced Hep B Surveillance

Morbidity and Mortality Weekly Report

Surveillance for Chronic Hepatitis B Virus Infection — New York City, June 2008–November 2009

Chronic hepatitis B virus (HBV) infection is a leading cause of cirrhosis and liver cancer worldwide (1); the estimated prevalence in the United States is 0.3%–0.5% (2). Each year, approximately 11,500–13,000 persons are newly reported with a positive HBV test to the New York City (NYC) Department of Health and Mental Hygiene (DOHMH) (3). To characterize chronic HBV patients, DOHMH began ongoing enhanced chronic HBV surveillance, selecting a random sample of newly reported cases and collecting more detailed information from the patients’ clinicians. This report summarizes investigations of 180 randomly selected HBV cases reported during June 2008–November 2009. Approximately two thirds (67%) of patients were Asian, and the most commonly reported reason for HBV testing was the patient’s birth country or race/ethnicity (27%). In 70% of cases, the clinician did not know of any

To learn more about HBV patients in NYC, every 2 months persons newly reported to DOHMH 2–3 months earlier with a positive HBV test were selected from the HBV surveillance database. Patients without a recorded date of birth were excluded (<3% of reports). From this dataset, a simple random sample of 20 patients was created using a SAS survey selection procedure.† Investigators telephoned the clinician who ordered the HBV test, then faxed a standard questionnaire, and followed-up by telephone as needed. If the clinician mentioned another clinician who knew the patient better, staff members contacted this clinician as well. In cases in which clinicians were unable or unwilling to provide information by telephone or fax, DOHMH staff members reviewed medical charts. Data collected included demographics, reasons for HBV testing, hepatitis A vaccination status, and HBV-related risk factors.
# Enhanced Hep B Surveillance

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Number</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic</td>
<td>26</td>
<td>8.6</td>
</tr>
<tr>
<td>Non-Hispanic Black</td>
<td>41</td>
<td>13.5</td>
</tr>
<tr>
<td>Non-Hispanic White</td>
<td>17</td>
<td>5.6</td>
</tr>
<tr>
<td>Asian</td>
<td>197</td>
<td>65.0</td>
</tr>
<tr>
<td>Other</td>
<td>19</td>
<td>6.3</td>
</tr>
<tr>
<td>Unknown</td>
<td>3</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>303</strong></td>
<td></td>
</tr>
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</table>
## Enhanced HBV Surveillance

<table>
<thead>
<tr>
<th>Country of Birth</th>
<th>No.</th>
<th>(%)</th>
</tr>
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<tbody>
<tr>
<td>China</td>
<td>160</td>
<td>52.8</td>
</tr>
<tr>
<td>USA</td>
<td>19</td>
<td>6.3</td>
</tr>
<tr>
<td>Russia</td>
<td>9</td>
<td>3.0</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>8</td>
<td>2.6</td>
</tr>
<tr>
<td>Haiti</td>
<td>6</td>
<td>2.0</td>
</tr>
<tr>
<td>Korea</td>
<td>5</td>
<td>1.7</td>
</tr>
<tr>
<td>Albania</td>
<td>4</td>
<td>1.3</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>4</td>
<td>1.3</td>
</tr>
<tr>
<td>Nigeria</td>
<td>3</td>
<td>1.0</td>
</tr>
<tr>
<td>Puerto Rico</td>
<td>3</td>
<td>1.0</td>
</tr>
<tr>
<td>Congo</td>
<td>2</td>
<td>0.7</td>
</tr>
<tr>
<td>Guyana</td>
<td>2</td>
<td>0.7</td>
</tr>
<tr>
<td>Nepal</td>
<td>2</td>
<td>0.7</td>
</tr>
<tr>
<td>Senegal</td>
<td>2</td>
<td>0.7</td>
</tr>
<tr>
<td>Taiwan</td>
<td>2</td>
<td>0.7</td>
</tr>
<tr>
<td>All other*</td>
<td>17</td>
<td>5.6</td>
</tr>
<tr>
<td>Unknown</td>
<td>55</td>
<td>18.2</td>
</tr>
</tbody>
</table>

* Brazil, Ecuador, France, Greece, Hong Kong, Indonesia, Jamaica, Laos, Mauritania, Paraguay, Sudan, Tibet, Trinidad, Uzbekistan, Vietnam, Yugoslavia
ENHANCED HEP C SURVEILLANCE

- 36% of persons newly-reported with hep C had **not** been tested for Hep C RNA, which is needed to determine infection status

Next steps:
- Educate about need for Hep C RNA testing: Sites that screen for Hep C antibody should be funded to order the RNA test
- Encourage labs to offer **reflex** testing
- Encourage labs to add message to antibody-positive lab slips, for example →
Recommendation

Positive hep C antibody

Hepatitis C Ab (BHC)

Status: complete

Reference Range

Normal Result

Abnormal Result

Reactive

non-reactive

Hypotension, unspecified

Event: 12/05/2010 2305

Test/ Diagnosis

HCV Ab

Ref Lab

Result Comment

Recommend ordering HCV PCR test to determine the current HCV infection status.
<table>
<thead>
<tr>
<th>TEST-NAME</th>
<th>RESULT</th>
<th>FLAG</th>
<th>REF RANGE</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hep B Surface Ag</td>
<td>*Negative</td>
<td>Negative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hep B Surface Ab Quant</td>
<td>*11</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Interpretation:
- >=10: Antibodies present (Probable Immunity)
- <10: Antibodies not present (No Immunity)

Test performed using Siemens Centaur chemiluminescent assay. Values obtained with different assays cannot be used interchangeably.

Hep C Ab w/RIBA Reflex *Positive   X Negative
Confirmed by high s/co ratio.
Samples with high signal-to-cut-off ratios usually (>95%) confirm positive, but supplemental serologic testing was not performed. Less than 5 of every 100 might represent false-positives; more specific testing should be requested, if indicated.

Guidelines for Hemodialysis Adequacy: Update 2000, Guideline 2)

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
<th>Reference Range</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Protein</td>
<td>7.2</td>
<td>6.1–8.4</td>
<td>g/dL</td>
</tr>
<tr>
<td>Albumin</td>
<td>3.9</td>
<td>3.6–5.4</td>
<td>g/dL</td>
</tr>
</tbody>
</table>

*New Results, ABN=Abnormal, C=Critical, H=High, L=Low, X=Absurd
Diagnosing and Managing Hepatitis C

- Ask all patients about risk factors for hepatitis C and order an antibody test for patients at risk or patients who request testing.
- Follow a positive antibody test with a test for viral RNA to determine whether the patient has current hepatitis C virus infection.
- Counsel hepatitis C virus-infected patients to discontinue alcohol and injection drug use.
- Refer hepatitis C virus-infected patients to specialists if they have significant liver disease or are candidates for hepatitis C treatment (see page 60).

Anne Marie France, Katherine Bornschlegel, Julie Lazaroff, Joseph Kennedy, and Sharon Balter

**ABSTRACT** Chronic hepatitis B virus (HBV) infection is a preventable cause of liver failure, cirrhosis, and liver cancer; estimated chronic HBV infection prevalence is 0.3–0.5% in the USA. Prevalence in New York City (NYC) is likely higher because foreign-born persons, who represent 36% of NYC’s population versus 11% nationwide, bear a disproportionate burden of chronic HBV infection. However, because no comprehensive, population-based survey of chronic HBV infection has been conducted in NYC, a reliable prevalence estimate is unavailable. We used two approaches to estimate chronic HBV infection prevalence in NYC: (1) a census-based estimate, combining local and national prevalence data for specific populations, and (2) a surveillance-based estimate.
Hep B Prevalence Estimates for NYC: 2 Methods

- Surveillance data $\rightarrow$ 1.2%
- Census data $\rightarrow$ 1.2%
- Compared to national hep B prevalence estimate: 0.3 – 0.5% *
- NYC prevalence is 2 to 4 times higher

* Weinbaum et al, MMWR, Sept 19, 2008, 57(RR08); 1-20
HEP C PREVALENCE ESTIMATES FOR NYC

- Preliminary work
- Surveillance data, adjusted for
  - deaths
  - outmigration
  - RNA negative status
  - Under-diagnosis
- Preliminary prevalence estimate: 1.2% to 3.8%
  - Midpoint is 1.8%
INVESTIGATING HEALTHCARE-ASSOCIATED INFECTIONS

- Most are called in to the Health Department
- Obtain list of patients seen at site, that day and flanking days if indicated
- Match to hep B and C surveillance databases
- Look for potential source cases and for other persons who may have been infected that day
- Helps to determine whether a single case is part of a larger problem
Example: Healthcare-associated Hepatitis Investigation

- Index: 45 yo male with acute hep C, fulminant
- Recent outpatient endoscopy with IV anesthesia
- Obtained log of all 21 patients scoped that day
- Matched to our surveillance database
- Two patients matched – both have remote hep C diagnosis dates so they represent potential sources
- Obtained blood and sequenced (NYS lab)
Multiple Clusters of Hepatitis Virus Infections Associated With Anesthesia for Outpatient Endoscopy Procedures

BRUCE GUTELIUS,*,† JOSEPH F. PERZ,§ MONICA M. PARKER,‖ RENEE HALLACK,‖ RACHEL STRICOF,‖ ERNEST J. CLEMENT,‖ YULIN LIN,§ GUO-LIANG XIA,§ AMADO PUNOSALANG,‡ ANTONELLA ERAMO,‡ MARCI LAYTON,‡ and SHARON BALTER‡

BACKGROUND & AIMS: Hepatitis B virus (HBV) and hepatitis C virus (HCV) can be transmitted during administration of intravenous anesthesia when medication vials are used for multiple patients using incorrect technique. We investigated an outbreak of acute HBV and HCV infections among patients who received anesthesia during endoscopy procedures from the same anesthesiologist (anesthesiologist 1), in 2 different gastroenterology clinics. METHODS: Chart reviews, patient interviews, clinic site visits and infection control assessments, and molecular sequencing of patient isolates were performed. Patients treated by anesthesiologist 1 on specific procedure days were offered testing for blood-borne pathogens. Endoscopy and anesthesia procedures were reviewed. HCV seroconversion was noted in 1 patient with HBV infection and in 1 patient without HBV infection. C virus (HCV) as a result of an outpatient procedure. This patient had no other risk factors for infection and had tested negative for HCV antibodies 1 week before an esophagoduodenoscopy performed in 2006. The patient subsequently experienced symptomatic HCV infection diagnosed 3 months after the esophagoduodenoscopy was performed. Given the presentation within the expected incubation period and a documented HCV seroconversion, the DOHMH initiated an investigation to determine whether the infection occurred as a result of medical procedures performed at the physician’s office and, if so, to assess modes of transmission, prevent additional transmission, and identify other persons at risk who needed testing.
OTHER PROJECTS

- Investigating specific subsets of hep B and C reports to look for acute cases
- Focus on Hep C among youth
- Unusual lab values (e.g., hep B e antigen positive but sAg negative)
- Hep D
- Hep E
- Acute Hep B – investigate all cases since 2003
- Hep A – expedited reporting to enable prophylaxis of more close contacts
SUMMARY

- Funding for chronic hep B and C surveillance in NYC has had substantial benefits
- Used surveillance data and our enhanced surveillance projects (sampling) to:
  - Educate patients, clinicians, stakeholders
  - Better characterize chronic hep B and C populations
  - Identify unmet needs among patients and clinicians
  - Develop prevention, outreach and education activities
  - Estimate prevalence
  - Investigate healthcare-associated hep B and C cases
SUMMARY (CONTINUED)

- Shared protocols and data collection instruments
- Shared findings in meetings, conferences and the literature
- Many stakeholders using NYC’s surveillance data
  - Grant writing
  - Siting needle-exchange programs, clinical care sites, community-based hep B/C support groups
  - Documenting the need for Hep C RNA testing
**Future Possibilities**

- Modify the Health Code to discontinue clinician reporting of chronic Hep B and C and rely on lab reporting
  - Require clinicians to report acute cases only
  - Require clinicians to provide any needed follow-up information
- Pilot a new case definition that would count only RNA positive persons as true hep C cases
- Once reflex RNA testing is in place, consider discontinuing reporting Hep C antibody; rely on RNA
- Consider requiring labs to report negative Hep C RNA tests, so we can track
  - Spontaneously resolved infections
  - Treatment successes
ACKNOWLEDGEMENTS

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