

Defining an Emerging Epidemic: HCV Seroprevalence in a Large, Tertiary-Care Health Network in Pennsylvania

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Defining an Emerging Epidemic:

HCV Seroprevalence in a Large, Tertiary-care Health Network in Pennsylvania

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Background:

In the United States, 1.6% of the population is infected with the hepatitis C virus (HCV), representing approximately 4-5 million people. Since most of these individuals remain unaware of their infection, they can serve as an ongoing source of transmission to others. HCV-infection places them at risk of developing progressive fibrosis leading to cirrhosis and possibly hepatocellular carcinoma. Additionally, undiagnosed individuals cannot benefit from potentially curative peginterferon/ribavirin therapy. The Lehigh Valley is the third most populated metropolitan region in Pennsylvania, consisting of Lehigh, Northampton, and Carbon counties in eastern PA. The local prevalence has been previously estimated at 0.78%, far less than NHANES data would predict. Our objective is to establish a prevalence of HCV in the community served by the 986 bed tertiary-care system of Lehigh Valley Health Network (LVHN), the largest health network in Pennsylvania.

Methods:

- Based on a 99% confidence interval with a 5% margin for error, an adequate sample size was determined to be 1000 subjects.
- 1000 consecutive leftover blood samples were studied: 399 inpatients and 601 outpatients (including Emergency Department).
- Samples were stratified by age and sex based on hospital admission statistics. Baseline demographics including age, sex, zip code of residence, and site of care (inpatient vs. outpatient) were collected.
- De-identified samples were analyzed for HCV via Abbott's Microparticle Enzyme ImmunoAssay (RIBA performed on those not meeting the CDC's recommended signal to cut-off ratio of 9.9 for true antibody positivity) and for human immunodeficiency virus (HIV) via ELISA with confirmatory Western blot.
- Univariate and multivariate analyses were conducted in SPSS 15.0 statistical software, utilizing T-test, Pearson's Chi-square and correlation analyses, and reporting Poisson's 95% confidence intervals where appropriate.

Table 1: Planned Sample Distribution based on LVHN Discharge Data (Dec. 2005 - Nov. 2006)

Inpatient		
Age Group	Male	Female
Group I 18-24	9	18
Group II 25-34	13	32
Group III 35-44	23	34
Group IV 45-54	37	40
Group V 55-64	39	39
Group VI 65-80	58	57
TOTAL	180	220
Outpatient		
Age Group	Male	Female
Group I 18-24	25	35
Group II 25-34	32	48
Group III 35-44	42	69
Group IV 45-54	48	83
Group V 55-64	40	65
Group VI 65-80	45	68
TOTAL	232	368

Figure 1a: Sample Population Distributed by Age

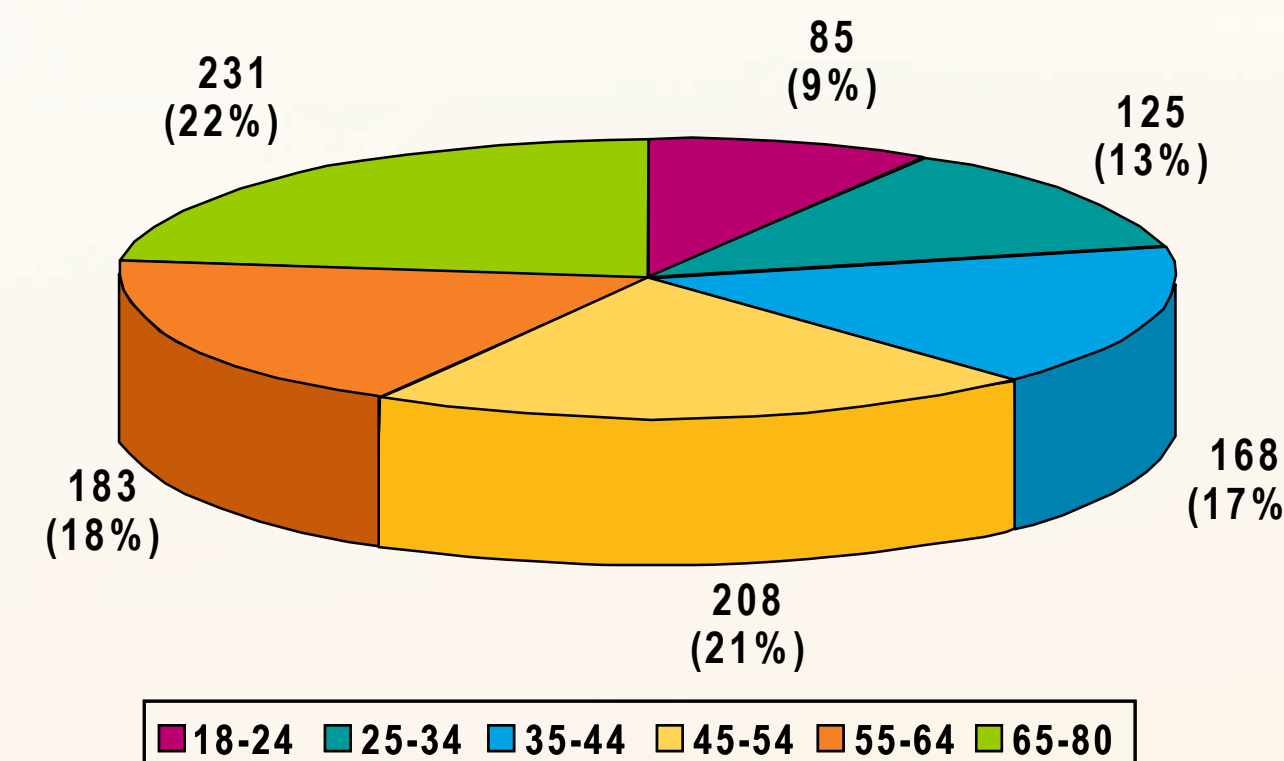


Figure 1b: HCV-positive Results Distributed by Age

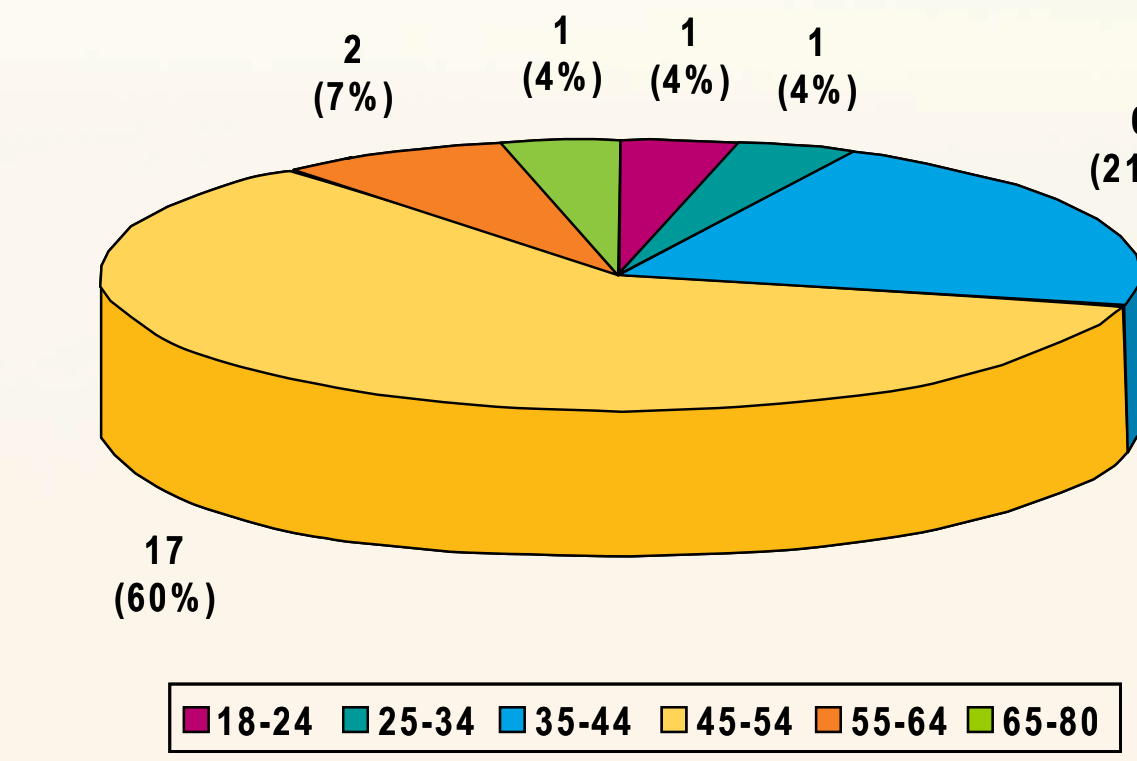
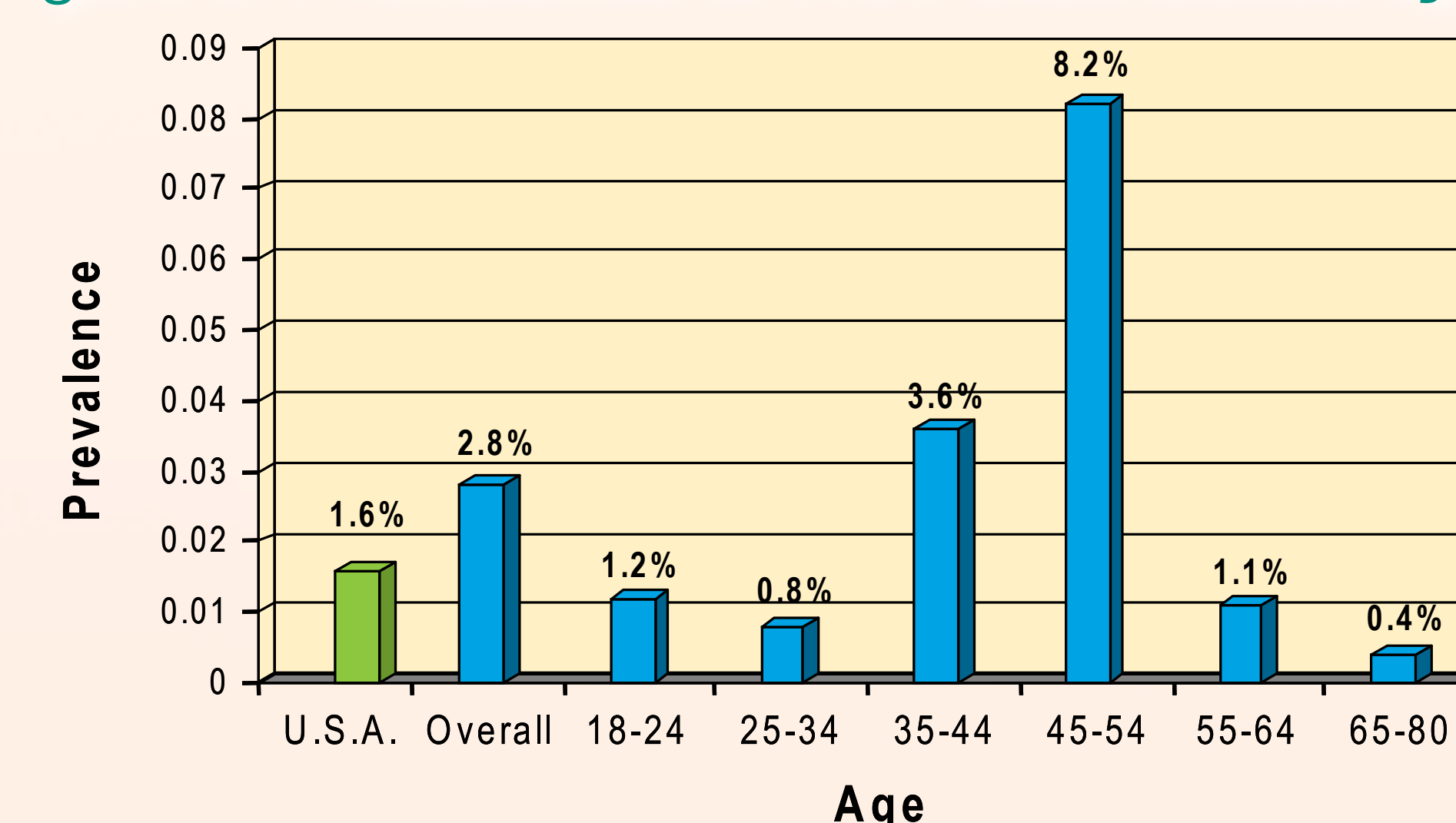


Figure 2: Prevalence of HCV Distributed by Age



Results:

- Twenty-eight samples (2.8%) tested positive for HCV.
- The highest HCV prevalence was seen among those aged 45-54 years old (8.2%), representing 60.7% of all HCV-positive tests. The next highest prevalence was among those aged 35-44 years old: 3.6% [x2 p<0.001].
- Men were more than twice as likely as women to be HCV-positive (OR 2.2; CI [1.03,4.81]).
- HCV seroprevalence was evenly distributed among inpatient and outpatient settings (x2 p>0.05) and among urban, suburban, and rural areas.
- Three subjects (10.7% of HCV-positive subjects), all inpatients who lived in an urban area, were co-infected with HIV. HIV prevalence results have been previously presented elsewhere.

CONCLUSIONS:

HCV seroprevalence in LVHN far exceeds previous local estimates and is nearly twice the national prevalence. Whereas illicit drug use is commonly considered to be more prevalent in urban areas, HCV-positive subjects in this study were scattered widely among the urban, suburban, and rural areas served by LVHN. Thus, a significant number of HCV-positive individuals may be missed if local testing efforts targeted urban centers alone. Broad testing for HCV, particularly among individuals born between 1954 and 1973, would result in the diagnosis of a significant number of HCV-infected individuals and allow referral for potentially curative peginterferon alfa and ribavirin combination therapy.