

Hepatocellular Carcinoma and Hepatitis B and C Virus: Results from a Pilot Linkage in Louisiana

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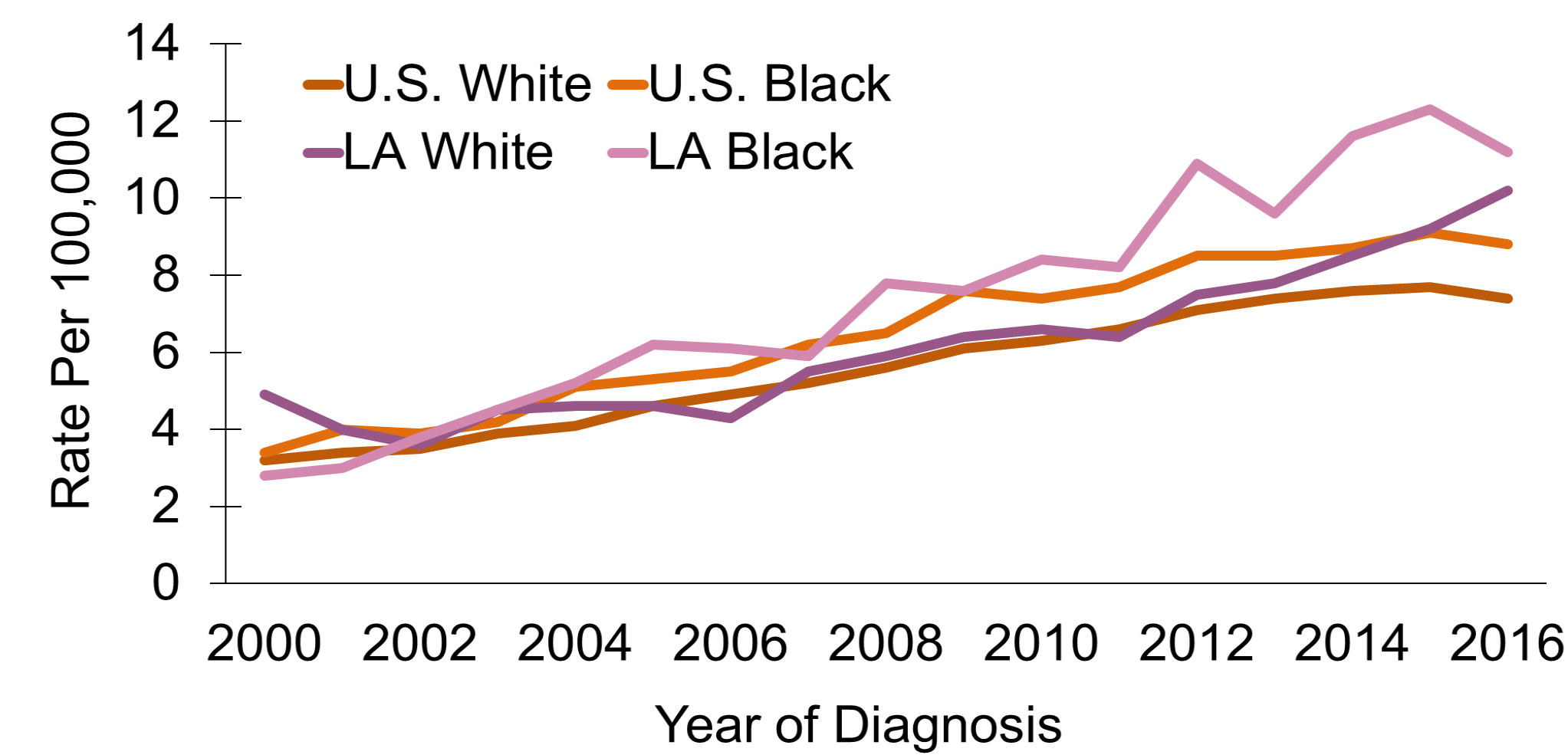
sph.lsuhscc.edu/louisiana-tumor-registry

BACKGROUND

In the last 5 years (2011-2015), liver cancer was the sixth leading cause of cancer deaths in the U.S., of which 88% were hepatocellular carcinomas (HCC). HCC incidence rates have been steadily on the rise for the past 16 years.

Several studies have shown that one of the main risk factors for HCC is hepatitis B and C virus (HBV, HCV) infections. However, due to limited resources, cancer registries do not collect HBV and HCV data routinely.

Figure 1: HCC Trends of Incidence Rates, 2000-2016



OBJECTIVES

This pilot aimed to explore the feasibility of obtaining the data through a linkage between the Louisiana Tumor Registry (LTR) and the Infectious Disease Epidemiology (IDE) Hepatitis B and C Surveillance Program and to describe the relationship of HCC and HBV/HCV using data from the above linkage.

METHODS

Louisiana cancer cases diagnosed in 2016 and Hepatitis B/C surveillance data were matched utilizing Match*Pro software. Louisiana's IDE surveillance data contained Hepatitis B cases collected between 1988 and March 2018 and Hepatitis C cases between 1990 and March 2018.

Matched cases were ascertained and reviewed using linkage algorithms as well as probabilistic linkage strategies agreed upon by LTR and IDE. Both LTR and IDE personnel reviewed and determined true matches based on uniqueness of first and last name, SSN, DOB and address.

HCC cases diagnosed in 2016 in Louisiana were stratified based on their Hepatitis status (no or unknown Hepatitis, Hepatitis C, or Hepatitis B) to examine differences in demographic characteristics and stage at diagnosis (malignant ICD-O-3 morphology codes 8170-8180). Chi-Square and logistic regression analyses were conducted using SAS 9.4.

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RESULTS

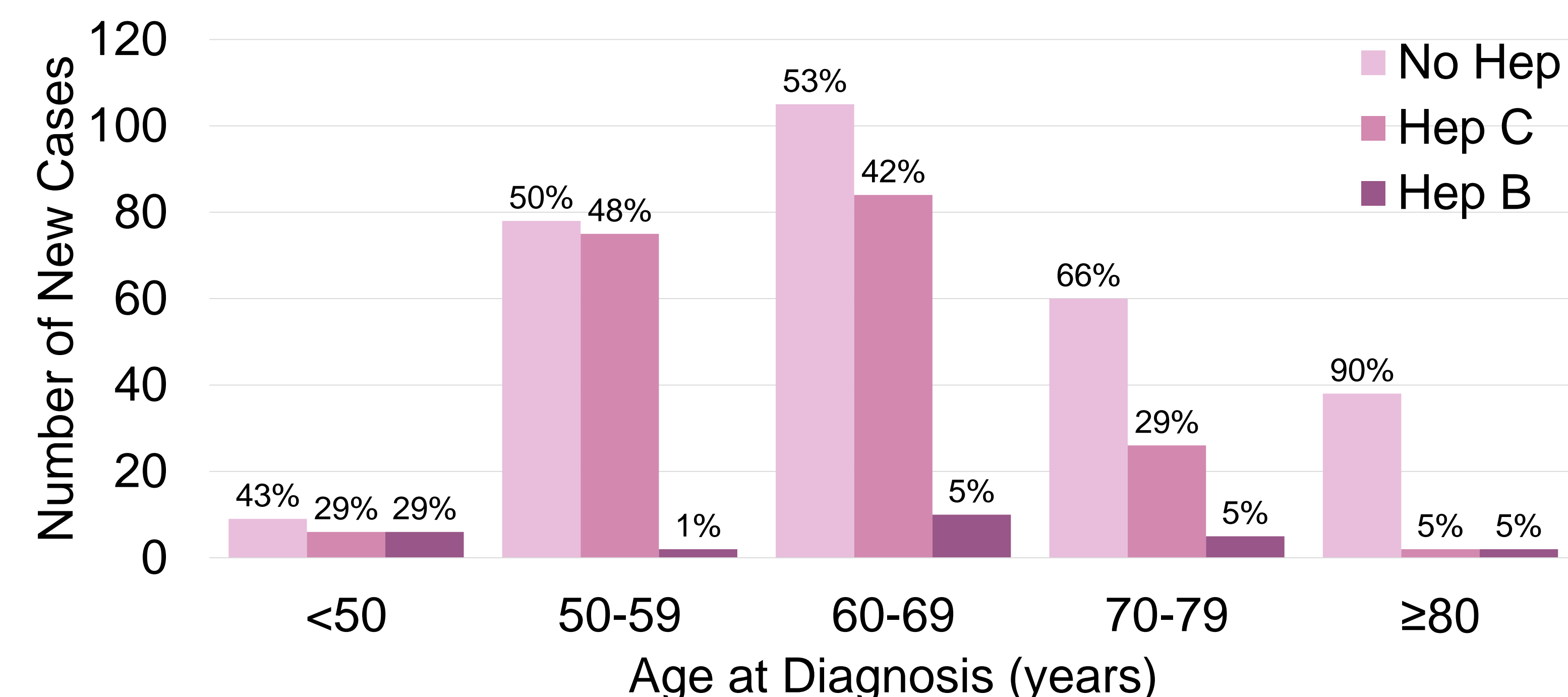
Overall, 0.3% (834) of the LTR cancer cases matched with IDE data. Approximately 27.2% (227) of those matches were HCC cases and 72.7% (607) were other cancers.

In total, 508 HCC cases were diagnosed in Louisiana in 2016, of which 38.0% (193) were positive for HCV, 4.9% (25) were positive for HBV, and 57.1% (290) had no or unknown hepatitis viral infection.

Table 1. Descriptive characteristics of HCC cases diagnosed in Louisiana.

Characteristics	No Hepatitis (n=290)	Hepatitis C (n=193)	Hepatitis B (n=25)	P value	Total
Sex				0.8114	508
Male	225 (56.5%)	154 (38.7%)	19 (4.8%)		
Female	65 (59.1%)	39 (35.5%)	6 (5.4%)		
Race				<.0001	508
White	206 (66.0%)	100 (32.1%)	6 (1.9%)		
Black	78 (44.3%)	89 (50.6%)	9 (5.1%)		
Other	6 (30.0%)	4 (20.0%)	10 (50.0%)		
Stage at Diagnosis				0.4540	463
Local	152 (58.5%)	92 (35.4%)	16 (6.2%)		
Regional	61 (50.4%)	54 (44.6%)	6 (4.9%)		
Distant	48 (58.5%)	31 (37.8%)	3 (3.7%)		

Figure 2. Number of new HCC cases by hepatitis infection status and age.



RESULTS

Table 2. Odds ratio and 95% confidence intervals of being hepatitis positive among HCC patients.

Variable	N	Crude OR	95% CI	Adjusted OR	95% CI
Sex					
Male	398	ref		ref	
Female	110	0.88	0.57- 1.37	0.99	0.61- 1.59
Race					
White	312			ref	
Black	176	2.44	1.67- 3.57	2.13	1.43- 3.18
Age at diagnosis					
<50	21	ref		ref	
50-59	155	1.29	0.46- 3.63	1.38	0.47- 3.98
60-69	199	1.11	0.39- 3.11	1.21	0.41- 3.50
70-79	91	0.60	0.20-1.78	0.76	0.23- 2.37
≥80	42	0.14	0.03- 0.58	0.21	0.04- 0.92
Insurance					
Private	121	ref		ref	
Medicare and other public	195	0.51	0.32- 0.81	0.64	0.37- 1.0
Medicaid	144	0.96	0.59- 1.58	0.74	0.43- 1.25
No insurance	37	0.98	0.46- 2.09	0.87	0.39- 1.91
Unknown	11	0.26	0.05- 1.27	0.26	0.05- 1.31

CONCLUSION

Preliminary statistics showed that 38.0% of HCC cases were positive for HCV in Louisiana, which is higher than the nation at 22.9%.

The feasibility of a linkage of cancer registry data with the IDE data and the subsequent usefulness of these linkage was demonstrated during this analysis. However, SSN data was available for only 3.1% of the records from IDE data, increasing the number of matches that needed to be manually reviewed. IDE plans to use other sources to improve their SSN completeness.

In the future, linkage reliability and data completeness will be greatly improved by more complete SSN data. Thus, access to this data on a larger scale will enable further investigation of the relationship between HCC and HBV/HCV while addressing racial, gender, and geographic disparities.

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