



Marginal Health Care Expenditure of Patients with Viral Hepatitis in the U.S: Analysis of Medical Expenditure Panel Survey (2011-2020)

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BACKGROUND

- Viral hepatitis is a serious but preventable public health problem that increases the risk of liver disease, cancer, and death in infected patients.
- About 2.4 million people live with Hepatitis C Virus (HCV) and approximately 2.2 million people with Chronic Hepatitis B (CHB) in the United States.¹
- Chronic viral hepatitis infection leads to cirrhosis, Hepatocellular Carcinoma (HCC), and liver failure and is also associated with reduced quality of life and significant economic burden.^{2,3}
- Since 2009, Food and Drug Administration (FDA) has approved a new class of drugs for HCV and two new molecules for HBV.⁴ However, there exists data gap regarding healthcare burden for viral hepatitis after introducing new drugs.

OBJECTIVE

This study examined the marginal healthcare expenditures for viral hepatitis using the Medical Expenditure Panel Survey.

METHODS

- Data sources:** This retrospective, cross-sectional study used the Medical Expenditure Panel Survey (MEPS) from 2011-2020.
- It is a nationally representative survey of American individuals, their families, and their healthcare providers sponsored by the Agency for Research and Quality of Care Health Care (AHRQ).
- Study population:** The study includes adults ≥18 years.
- Individuals with viral hepatitis were identified using medical component files (using International Classification of Diseases, (ICD-9) and (ICD-10) codes).
- The Andersen Behavioral Model (ABM) framework was used to select covariates to adjust in the multivariable model.
- Outcomes:** Health Care expenditures (2020 inflation-adjusted) by patients with viral hepatitis included hospital inpatient, ambulatory services, emergency room, prescription medications, dental, and other expenditures reported in the full-year consolidated files.
- Analyses:** Descriptive weighted analyses were used to examine healthcare-related expenditures for patients with viral hepatitis and other participants without viral hepatitis.
- A two-part model involving probit and log link function was used to estimate the marginal increase in total healthcare expenditures adjusting for other co-variates as the ABM.
- Analysis was performed by using SAS version 9.4.

RESULTS

- According to the MEPS, 0.49 million patients (95%CI=0.41-0.57, 0.19%) were diagnosed with viral hepatitis annually, accounting for a prevalence of 0.19%.
- Most of these viral hepatitis patients were in the age group of 45-64 years (62.53%), male (54.17%), and white (59.3%).
- The two-part model revealed that the marginal total healthcare expenditures in patients diagnosed with viral hepatitis were \$17,221.32 (95%CI=\$8,933.09-\$25,509.55) more compared with those without viral hepatitis.
- The mean adjusted prescription medication expenditures for the viral-hepatitis group were \$11,214.89 (95%CI=\$5,286.91-\$17,142.86) higher than other participants.

Table 1. Demographic Characteristics of Adults with Viral Hepatitis and Non-hepatitis: Medical Expenditure Panel Survey 2011-2020

		Non-Hepatitis Group (n=258,441,902) %		Hepatitis Group (n=488,115) %		p-value	
Age in years	18-44	82,749,209	(32.02)	81,102	(16.62)	<.0001	
	45-64	71,891,942	(27.82)	305,238	(62.53)		
	65+	47,578,158	(18.41)	94,020	(19.26)		
Sex	Male	120,148,708	(46.49)	264,407	(54.17)	0.0199	
	Female	138,293,194	(53.51)	223,707	(45.83)		
Race	White	172,094,993	(66.59)	289,455	(59.30)	<.0001	
	Black	28,659,044	(11.09)	75,478	(15.46)		
	Asian	12,697,890	(4.91)	60,687	(12.43)		
	Hispanic	36,023,403	(13.94)	42,548	(8.72)		
Education	Less than High School	97,264,690	(37.64)	161,585	(33.10)	<.0001	
	High School Diploma	75,264,753	(29.12)	208,132	(42.64)		
	College Degree	63,516,612	(24.58)	107,460	(22.02)		
	Masters/ Higher	22,395,847	(8.67)	10,937	(2.24)		
Marital Status	Never Married	56,538,183	(21.88)	91,822	(18.81)	<.0001	
	Married	109,744,594	(42.46)	210,624	(43.15)		
	Separated	44,414,428	(17.19)	184,807	(37.86)		
Income	Poor/near poor	43,940,310	(17.00)	190,250	(38.98)	<.0001	
	Low income	33,606,718	(13.00)	72,284	(14.81)		
	Middle income	74,299,979	(28.75)	111,341	(22.81)		
High income	106,594,895	(41.25)	114,239	(23.40)			
	Insurance	Uninsured	16,436,747	(6.36)	36,067	(7.39)	<.0001
		Public	66,481,172	(25.72)	258,808	(53.02)	
Private		175,523,983	(67.92)	193,240	(39.59)		
Elixhauser Score (Mean)		0.52 ± 0.02		0.11		0.1628	

1 p-value: chi sq test & < 0.05 was considered significant

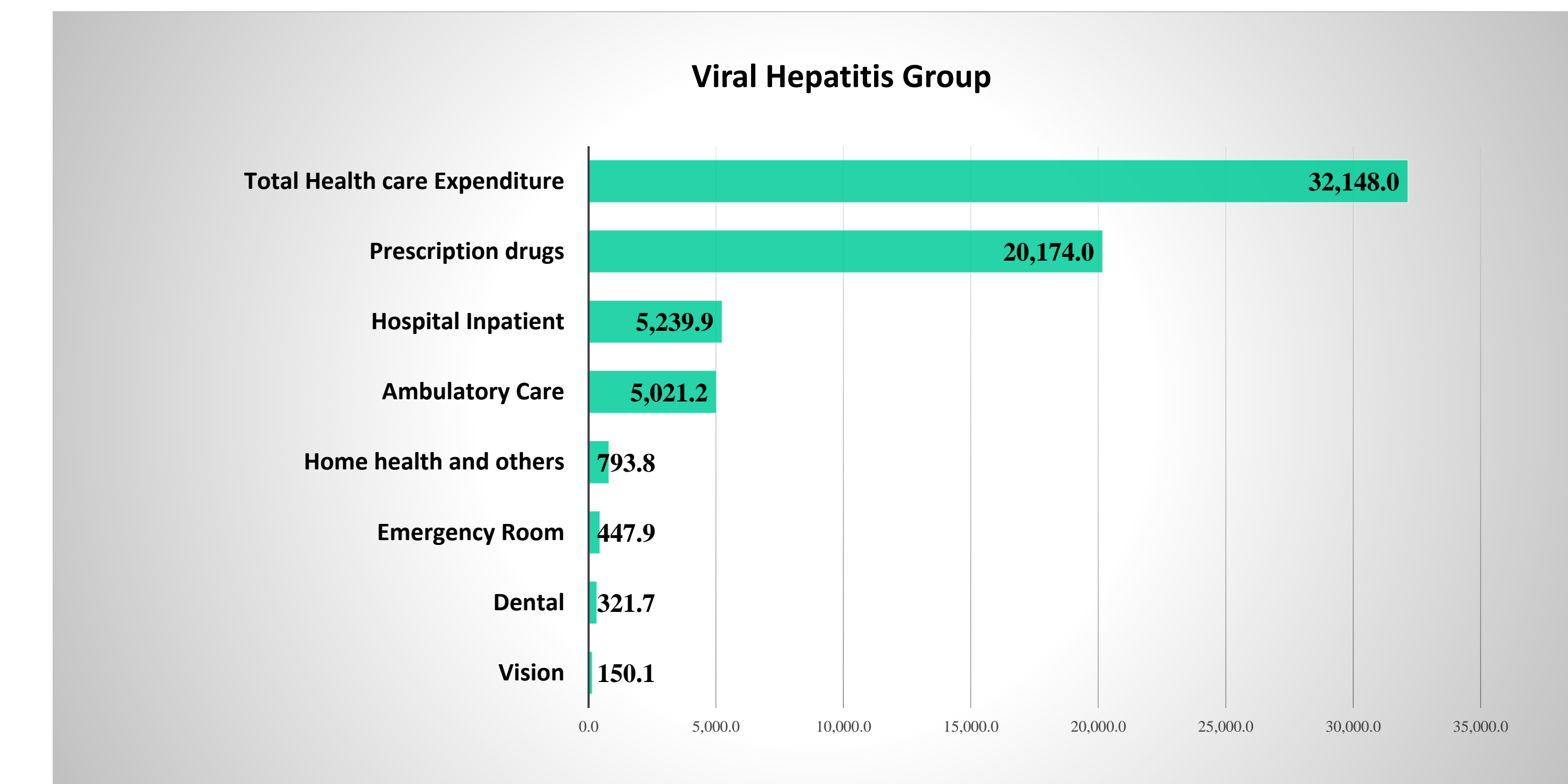


Figure 1. Annual Healthcare Expenditure of Viral Hepatitis Patients

Table 2. Marginal Health Care Expenditures in Viral Hepatitis Patients by Health Care Service: Medical Expenditure Panel Survey 2011-2020

Type of Health Care Service	Marginal Expenditures, \$	95% Confidence Interval	P-value
Total	17,221.32	8,933.09 -- 25,509.55	<.0001
Hospital Inpatient	1,864.48	196.40 -- 3,532.57	0.029
Ambulatory	2,069.74	1,170.30 -- 2,969.19	<.0001
Emergency Room	71.40162	-48.50 -- 191.30	0.242
Prescription medications	1,1214.89	5,286.91 -- 17,142.86	<.0001
Dental	-7.80	-188.64 -- 173.02	0.932
Vision	90.87	-52.74 -- 234.49	0.214
Home health and others	1.67	-265.50 -- 268.84	0.01

Figure 2. Total Health Care Expenditure between viral and non-viral Hepatitis from 2011 to 2020
1 p-value < 0.05 was considered significant

CONCLUSION

- The study found significant healthcare expenditures for managing viral hepatitis, with a major proportion attributable to prescription drugs.
- Therefore, concerted efforts are needed to improve access to prescription medications to reduce healthcare costs and improve quality of life.

LIMITATIONS

- A cross-sectional, observational study design has inherent external validity limitations.
- Only non-institutionalized patients are included, while viral hepatitis is more prevalent in prisoners and the homeless.
- Specific information on the type and severity of hepatitis was not available.

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