

Comparison of Direct Medical Costs and Services by Point of Service and Prescription Cost for Persons with Hepatitis-C with and without Treatment

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Abstract

Objectives: To compare the direct medical costs and services by point of service (PoS) and the prescription drug (Rx) costs and services for persons with Hepatitis-C (HCV) who are treated (HCV-Tx) and not-treated (HCV-noTx).

Methods: A retrospective analysis using the HCMS Research Reference database, which represents multiple US-based employers and contains employee data from 2001-2Q2007. This analysis compared the annual direct medical costs and services for healthcare by PoS, and Rx costs and services for HCV employees with and without Tx. ICD-9 Codes were used to identify employees with HCV. All subjects were required to have 81 month of eligibility. The first ribavirin, interferon or peginterferon Rx was the HCV-Tx cohort's index date. The HCV-noTx cohort was assigned the average index date (by company) of the HCV-Tx cohort. Two-part regression models were used to compare the cohorts adjusting for demographics, job-related variables, eligibility months, and Charlson Comorbidity Index. PoS Locations include: doctors office (MD), inpatient hospital (IN), outpatient hospital or clinic (OUT), emergency department (ED), laboratory (LAB), and other. Annual Rx costs and services were also calculated. All costs were inflated to 2010 US\$.

Results: Data were available for 900 employees (HCV-Tx=216; HCV-noTx=684). The cohorts differed in salaries, the %married, %white, and %exempt. Mean HCV-noTx cohort IN (\$836, $P=0.0001$) and OUT (\$488, $P=0.0018$) costs were higher, and HCV-Tx MD (\$564, $P<0.0001$), LAB (\$42, $P<0.0001$) and Rx (\$21,420, $P<0.0001$) costs were higher. The HCV-noTx cohort had more IN services (1.83, $P=0.0021$), while the HCV-Tx cohort had more MD (15.48, $P<0.0001$), LAB (3.31, $P<0.0001$) and Rx (12.0, $P<0.0001$) services. Overall, HCV-Tx direct medical costs were \$3556 (services=54.40) which were lower than the HCV-noTx (\$4234; services=35.39). The HCV-Tx cohort had 27.84 Rx (\$22,726) vs the HCV-noTx cohort's 15.84 Rx (\$1408).

Conclusions: Higher costs associated with HCV Treatment in the MD office offset IN and OUT costs.

Presented at the ISPOR 16th Annual International Meeting, May 21-25, 2011, Baltimore, MD.

Sponsorship: The original research described in this poster was funded by Bristol-Myers Squibb (BMS), Wallingford, CT.

Citation: Brook RA, Kleinman NL, Smeeding JE. Comparison of Direct Medical Costs and Services by Point of Service and Prescription Cost for Persons With Hepatitis-C With and Without Treatment. *Value Health*. May 2011;14(3):A181.

Background

- The hepatitis C virus (HCV) is a major cause of chronic liver disease in the United States and worldwide. According to the Centers for Disease Control (CDC), HCV infection is the most common chronic blood borne viral infection in the United States.^{1,2}
- Recently, data were published comparing 900 employees with HCV with 152,011 controls by the point of service where the care was performed.³ This study reported the following significant ($P < 0.0001$) findings:
 - HCV employees had higher mean annual medical costs (\$3,012) than control employees (\$1,265) in all point-of-service categories
 - The annual prescription drug (Rx) cost for employees with HCV and the control cohort were \$4,932 and \$600, respectively.

Objectives

- To compare the direct medical costs and services by point of service (PoS) and the prescription drug (Rx) costs and prescriptions among persons with Hepatitis-C (HCV) who are treated (HCV-Tx) and not-treated (HCV-noTx).

Methods

- A retrospective analysis using the HCMS Research Reference Database, which represents multiple US-based employers and contained employee data from 2001-2Q2007.
- This analysis compared the annual direct medical costs and services for healthcare by PoS, and Rx costs and prescriptions for HCV employees with and without treatment.
- Incremental costs and services were calculated (Treated minus Untreated).
- ICD-9 Codes were used to identify employees with HCV. All subjects were required to have at least 1 month of eligibility.
- Index dates were assigned for all subjects and defined as:
 - The date of the first ribavirin, interferon or peginterferon Rx (for the HCV-Tx cohort).
 - The average index date (by company) of the HCV-Tx cohort (for the HCV-noTx cohort).
- Two-part regression models were used to compare the cohorts, adjusting for demographics, job-related variables, eligibility months, and Charlson Comorbidity Index.⁴
- PoS Locations include: doctors office (MD), inpatient hospital (IN), outpatient hospital or clinic (OUT), emergency department (ED), laboratory (LAB), and other.
- Annual direct Rx costs and prescriptions were also calculated.
- All costs were inflated to 2010 US\$.

Results

- Data were available for 900 employees (HCV-Tx=216; HCV-noTx=684, Table 1).
 - The treated employees:
 - Had a lower mean salary (by \$4,427)
 - Were more likely to be married (by 8.6 percentage points) and more likely to be white (by 16.6 percentage points)
 - Were less likely to be exempt (by 9.6 percentage points)
- The Adjusted Annual Prescription and Direct Medical Costs by Point of Service are presented in Table 2 and the incremental costs are presented in Figure 1.
 - Those undergoing treatment have significantly higher prescription drug costs (by \$21,316).
 - Those who underwent treatment, had lower direct medical costs (\$3,556) compared with those who did not (\$4,234), with significantly (all $P<0.01$):
 - Higher costs at the Doctor's office (by \$564) and Laboratory (by \$42)
 - Lower hospital costs for Inpatient (by \$836) and Outpatient care (by \$488)
- The Adjusted Annual Services Received by Point of Service are shown in Table 3 and the incremental services are presented in Figure 2:
 - Those who underwent treatment filled an additional 12 prescriptions ($P<0.0001$) and had 19.01 more services overall, with significantly ($P<0.01$) more services in the doctors' office (by 15.48) and Laboratory (by 3.31).

Table 1 Descriptive Statistics

Variable	HCV Employees		P-Value for Difference
	with Treatment (N=216)	without Treatment (N=684)	
	Mean (S.E.) or %	Mean (S.E.) or %	
Age (at index date)	46.35 (0.47)	45.37 (0.33)	0.0842
Tenure (at index date)	7.90 (0.47)	7.67 (0.27)	0.6780
Annual Salary	\$47,838 (\$1,817)	\$52,265 (\$1,198)	0.0426
Female	38.9%	39.8%	0.8182
Married	53.6%	45.0%	0.0303
White	59.7%	46.1%	0.0005
Black	13.4%	9.9%	0.1500
Hispanic	12.0%	9.8%	0.3454
Exempt	20.8%	30.4%	0.0064
Full Time	97.2%	96.9%	0.8262
Charlson Index	0.648 (0.096)	0.673 (0.057)	0.8323

N=207; Employees without treatment: N=662
S.E., Standard Error

Table 2 Adjusted Annual Direct Medical Costs by Point of Service

Point of Service	HCV Employees		Difference	
	with Treatment (N=216)	without Treatment (N=684)	In Means	P-Value
	Adjusted Mean Cost	Adjusted Mean Cost		
Doctor's Office	\$1,254	\$990	\$564	<0.0001
Inpatient Hospital	\$593	\$1,429	-\$836	0.0001
Outpatient Hospital or Clinic	\$1,183	\$1,672	-\$488	0.0018
Emergency Department	\$126	\$86	\$41	0.1397
Laboratory	\$65	\$23	\$42	<0.0001
Other	\$34	\$35	-\$1	0.9491
Total Direct Medical	\$3,556	\$4,234	-\$679	<0.0001
Prescription Drug	\$22,726	\$1,408	\$21,316	<0.0001

Table 3 Adjusted Annual Services Received by Point of Service

Point of Service	HCV Employees		Difference	
	with Treatment (N=216)	without Treatment (N=684)	In Means	P-Value
	Adjusted Mean Cost	Adjusted Mean Cost		
Doctor's Office	35.28	19.80	15.48	<0.0001
Inpatient Hospital	1.94	3.76	-1.83	0.0021
Outpatient Hospital or Clinic	9.95	8.46	1.50	0.1482
Emergency Department	1.73	1.13	0.60	0.0802
Laboratory	5.20	1.88	3.31	<0.0001
Other	0.30	0.36	-0.06	0.3677
Total Services	54.40	35.39	19.01	<0.0001
Prescriptions	27.84	15.84	12.00	<0.0001

Figure 1. Incremental Direct Medical and Prescription Costs (Treated minus Untreated)

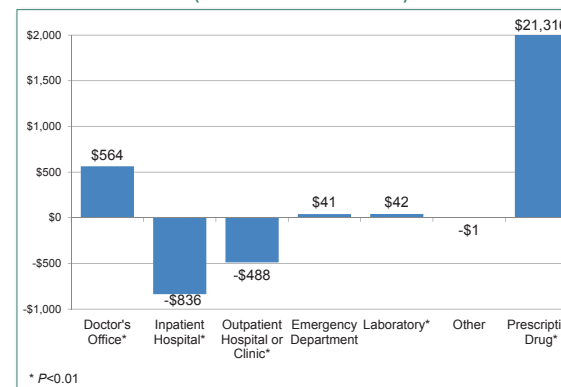
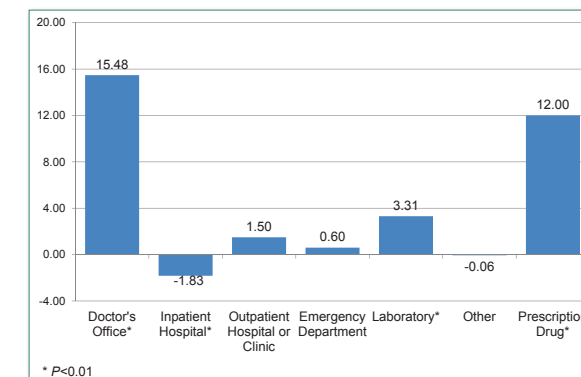


Figure 2. Incremental Direct Medical Services and Prescriptions (Treated minus Untreated)



Conclusions

- Current treatments for HCV cost \$22,726 per year in drug therapy (16 times higher than drug costs of non-treated employees).
- Higher costs associated with HCV Treatment in the doctors' office were offset by lower costs from hospitalizations and the use of outpatient clinics.

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