

# Impact of Direct-Acting Antiviral Use for Chronic Hepatitis C on Health Care Costs in Medicaid: Economic Model Update

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In our article published in a June 2019 supplement to *The American Journal of Managed Care*,<sup>1</sup> my coauthor and I estimated the burden of illness of chronic hepatitis C virus (HCV) in Medicaid using claims data from just prior to the introduction of the curative direct-acting antiviral (DAA) medications.<sup>2</sup> On average, patients with HCV had annual Medicaid costs that were \$17,674 (in 2017 US\$) more than those of individuals without HCV. In the second part of our study, we constructed an economic model that combined the HCV burden results with DAA cost and utilization information from 2013-2018 Medicaid State Drug Utilization Data (SDUD).<sup>3</sup> Our model considered drug-specific cure rates, treatment duration, and estimated rebates, and it assumed that patients cured by DAAs would have their HCV costs reduced by 90%—a figure derived via our detailed analysis of the health services utilized by HCV-infected individuals. We concluded that DAAs began to “pay for themselves” in Medicaid on a yearly basis in 2017, and cumulatively in 2019. We forecasted that by the end of 2022 DAAs would have saved Medicaid nearly \$12.1 billion (in 2017 US\$). Given that 3 (atypical) years have elapsed since its publication, an update to the model was warranted.

## METHODS

After expanding the DAA drug list to include the authorized generics of ledipasvir/sofosbuvir and sofosbuvir/velpatasvir launched in 2019, I extracted Medicaid SDUD data on all DAA prescriptions filled during the period 2018-2021. I maintained all prior model assumptions including the estimated mean rebate of 53.3% across all DAAs. Based on 2021 SDUD data, this translated to a mean net cost of \$5556 per 4-week supply of a DAA, which represents an 80% decrease from the initial price of sofosbuvir in 2013.<sup>4</sup> This indicates that a 12-week course of DAA treatment is less costly than a single year of HCV burden. Finally, the COVID-19 pandemic likely reduced DAA utilization, which declined in Medicaid by 24% from 2019 to 2021, a finding reported elsewhere.<sup>5</sup> To accommodate an expected rebound, I assumed a 1-time 10% increase in DAA use in Medicaid in 2022. Where noted, monetary values were converted into common

dollar years using the historical Consumer Price Index for medical care or 3% per year beyond 2022.<sup>6</sup>

## RESULTS

Tables 1 and 2 present the updated model forecasted through 2026. An estimated 284,580 Medicaid enrollees have been cured of HCV with DAAs from 2013 through 2021. This number is expected to grow to 485,955 by the end of 2026. Net total health care cost savings from DAA use in Medicaid exceeded \$5.19 billion in 2022. From 2013 to 2016, annual DAA treatment costs exceeded health care cost savings, but this reversed beginning in 2017. In 2019, cumulative net total health care cost savings turned positive, reaching just over \$15 billion in 2022—or \$13.2 billion in 2017 US\$, which is about 9% higher than predicted by the prior model. The model forecasts that by the end of 2026, DAAs will have generated cumulative net savings to Medicaid in excess of \$43 billion.

## CONCLUSIONS

The cost of curing chronic HCV using DAAs is now lower than a single year of disease burden in Medicaid. Any remaining access restrictions based on short-run cost-benefit calculations, even for patients with noncirrhotic disease, would seem to be misguided. Moreover, health care cost savings from DAAs accrue to Medicaid year after year, which further strengthens the case for expanded HCV screening and treatment. ■

**Author Affiliation:** RxEconomics LLC, Hunt Valley, MD.

**Source of Funding:** Pharmaceutical Research and Manufacturers of America (PhRMA).

**Author Disclosures:** Dr Roebuck reports receiving funding for this project from PhRMA.

**Authorship Information:** Concept and design; acquisition of data; analysis and interpretation of data; drafting of the manuscript; critical revision of the manuscript for important intellectual content; statistical analysis; obtaining funding; administrative, technical, or logistic support; and supervision.

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**TABLE 1.** Impact of DAA Use on Health Care Costs in Medicaid, 2013-2021

	Year									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	
	Actual									
DAA treatment costs										
Total amount reimbursed for DAAs (\$M)	\$4	\$1505	\$3021	\$3666	\$3149	\$1979	\$1943	\$1503	\$1343	
Estimated average rebate rate	23.1%	23.1%	31.0%	59.5%	54.1%	50.6%	53.3%	53.3%	53.3%	
Estimated total net cost of DAAs (\$M)	\$3	\$1157	\$2084	\$1485	\$1445	\$978	\$907	\$702	\$627	
Chronic HCV health care cost savings										
Estimated number of patients cured	32	12,175	26,199	35,157	40,344	46,349	48,439	39,271	36,614	
Estimated cumulative number of patients cured	32	12,207	38,406	73,563	113,907	160,256	208,695	247,966	284,580	
Burden of illness of chronic HCV (\$ PPPY)	\$15,808	\$16,186	\$16,612	\$17,241	\$17,674	\$18,023	\$18,533	\$19,293	\$19,531	
Estimated percentage of burden saved if cured	90%	90%	90%	90%	90%	90%	90%	90%	90%	
Estimated health care cost savings (\$ PPPY)	\$14,227	\$14,567	\$14,951	\$15,517	\$15,907	\$16,221	\$16,679	\$17,364	\$17,578	
Estimated total health care cost savings (\$M)	\$0.5	\$177.8	\$574.2	\$1141.5	\$1811.9	\$2599.5	\$3480.9	\$4305.7	\$5002.4	
Net total health care cost savings from DAA use (\$M, nominal)	-\$3	-\$979	-\$1510	-\$344	\$367	\$1622	\$2574	\$3604	\$4375	
Net total health care cost savings from DAA use (\$M, 2017)	-\$3	-\$1070	-\$1606	-\$352	\$367	\$1590	\$2454	\$3301	\$3959	
Net total health care cost savings from DAA use (\$M, 2022)	-\$3	-\$1217	-\$1828	-\$401	\$417	\$1810	\$2794	\$3758	\$4507	
Cumulative net total health care cost savings from DAA use (\$M, 2017)	-\$3	-\$1072	-\$2679	-\$3031	-\$2664	-\$1074	\$1380	\$4681	\$8641	
Cumulative net total health care cost savings from DAA use (\$M, 2022)	-\$3	-\$1221	-\$3049	-\$3450	-\$3033	-\$1223	\$1571	\$5329	\$9835	

\$M, millions of dollars; DAA, direct-acting antiviral; HCV, hepatitis C virus; PPPY, per patient per year.

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**TABLE 2.** Impact of DAA Use on Health Care Costs in Medicaid, 2022-2026

	Year				
	2022	2023	2024	2025	2026
	Estimated				
DAA treatment costs					
Total amount reimbursed for DAAs (\$M)	\$1477	\$1477	\$1477	\$1477	\$1477
Estimated average rebate rate	53.3%	53.3%	53.3%	53.3%	53.3%
Estimated total net cost of DAAs (\$M)	\$690	\$690	\$690	\$690	\$690
Chronic HCV health care cost savings					
Estimated number of patients cured	40,275	40,275	40,275	40,275	40,275
Estimated cumulative number of patients cured	324,855	365,130	405,405	445,680	485,955
Burden of illness of chronic HCV (\$ PPPY)	\$20,117	\$20,721	\$21,343	\$21,983	\$22,642
Estimated percentage of burden saved if cured	90%	90%	90%	90%	90%
Estimated health care cost savings (\$ PPPY)	\$18,106	\$18,649	\$19,208	\$19,785	\$20,378
Estimated total health care cost savings (\$M)	\$5881.7	\$6809.2	\$7787.1	\$8817.6	\$9902.8
Net total health care cost savings from DAA use (\$M, nominal)	\$5192	\$6119	\$7097	\$8128	\$9213
Net total health care cost savings from DAA use (\$M, 2017)	\$4561	\$5220	\$5877	\$6535	\$7191
Net total health care cost savings from DAA use (\$M, 2022)	\$5192	\$5941	\$6690	\$7438	\$8186
Cumulative net total health care cost savings from DAA use (\$M, 2017)	\$13,202	\$18,422	\$24,299	\$30,834	\$38,025
Cumulative net total health care cost savings from DAA use (\$M, 2022)	\$15,027	\$20,968	\$27,658	\$35,096	\$43,282

\$M, millions of dollars; DAA, direct-acting antiviral; HCV, hepatitis C virus; PPPY, per patient per year.