

A Systematic Review of Medical Costs Associated with Heart Failure in the US (2014-2020)

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Online Resource 5. Overview of cost estimates

Reference	Population (subgroup)	Sample size (no. with event)	Price/cost year	Follow-up duration	Reported mean cost, \$US	Mean cost, \$US 2019 values	Author's description of categories	Resource use valuation		
Adamson, 2016†[90]	HFH	148,803	2015	Average follow-up: 1.8 years	\$37,854	\$42,231	Annual HF hospitalization cost burden per patient	Costs		
					\$23,958	\$26,728	Average cost of a HF hospitalization			
Adejumo, 2019[60]	HF with PEM	32,771	2014	Initial hospitalization	\$35,290	\$40,407	Total cost of HF hospitalization	Costs		
	HF wo PEM	508,908			\$26,616	\$30,475				
Akintoye, 2017[116]	HF	1,946,895	2013/14 ^a	-	\$7,248*	\$8,299	Cost of HF hospitalization	Costs		
	HF in Northeast (Weighted)	387,280			\$8,102*	\$9,277				
	Midwest (Weighted)	449,805			\$7,203*	\$8,247				
	South (Weighted)	798,770			\$6,366*	\$7,289				
	West (Weighted)	311,040			\$8,898*	\$10,188				
Akintoye, 2017[63]	Total (weighted) - Full cohort HF	1,946,830	2013/14 ^a	-	\$7,248*	\$8,299	Cost of HF hospitalization	Charges & Costs using cost to charge ratios		
	Government (weighted) - Full cohort	226,815			\$25,229*	\$28,887	Charge of HF hospitalization			
					7,200*	\$8,244	Cost of HF hospitalization			
					19,652*	\$22,501	Charge of HF hospitalization			

Reference	Population (subgroup)	Sample size (no. with event)	Price/cost year	Follow-up duration	Reported mean cost, \$US	Mean cost, \$US 2019 values	Author's description of categories	Resource use valuation
	Not-for-profit (weighted) - Full cohort	1,430,240			7,462*	\$8,544	Cost of HF hospitalization	
					24,338*	\$27,867	Charge of HF hospitalization	
	For-profit (weighted) - Full cohort	289,775			6,290*	\$7,202	Cost of HF hospitalization	
					35,576*	\$40,734	Charge of HF hospitalization	
Amin, 2019[74]	HF	7,022	2014	One year	\$11,318	\$12,959	hospitalization Cost per HF event (admission)	Costs
	HF and hyponatremia correction		2016		\$2,832	\$3,044	Readmission Cost per discharge per patient	
	HF with hyponatremia	55,100	2014	One year	\$16,999	\$19,464	hospitalization cost per HF event (admission)	
	HF without hyponatremia correction		2016		\$3,401	\$3,656	Readmission Cost per discharge per patient	
Bress, 2016[44]	HFrEF	989	2014	6-year study period	\$61,131	\$69,994	Mean HF hospitalization charges	Charges
				Mean follow-up: 3 years per patient [(mean 36 (± 27), median 31 (IQL: 13, 55) months per patient]	\$63,764	\$73,009	Mean 30-day all-cause readmission (following HF hospitalization) charges	
				Index hospitalizations were included in the charge analysis.	\$57,394	\$65,715	Mean All-cause hospitalization charges	
					23051*	\$26,393	Median HF hospitalization charges	
					27514*	\$31,503	Median 30-day all-cause readmission (following HF hospitalization) charges	
					22310*	\$25,545	Median All-cause hospitalization charges	
Carey, 2016[53]	HF ^b	-	2011	-	\$6,089	\$7,583	Cost of 30-day all-cause readmission (following HF hospitalization)	Costs

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Chung, 2019[55]	HF	-	2014	-	\$6,392	\$7,319	HF Admission/ Readmission	Costs
Corbisiero, 2016[50]	HF CRT-responder	103	2010/11 ^a	Average follow-up: 1.4 years	\$7,205	\$8,972	Annual cost of HF hospitalization (Post-implant HF hospitalization cost)	Costs
	HF-CRT-non-responder	32			\$13,861	\$17,261	Annual cost of HF hospitalization (Post-implant HF hospitalization cost)	
Costanzo, 2016[45]	CHF	-	2016	-	\$16,708	\$17,960	CHF hospitalization cost	Costs
Echouffo-Tcheugui, 2017[64]	HF	1,764	2014	One year	\$23,854	\$27,313	Annual total medical cost (per person with HF), including inpatient, drug/medication/pharmacy, primary care/office/GP visits, outpatient visits, ED/AE visits, home health, and other (including nursing home, rehabilitation, vision, medical supplies, dental)	Costs
					\$11,318	\$12,959	Annual inpatient cost per patient	
Fitch, 2018[57]	HF	151,908	2017	Initial hospitalization	\$12,650	\$13,265	Average cost per HF admission including physician, ED visit, observation unit visit	Costs
				30 days after initial hospitalization	\$5,992	\$6,283	Average 30-day post-discharge cost following an HF admission (net 30-day baseline HF costs)	
Givertz, 2017†[34]	HFref	1,851	2015	first 30 days (after WCHF onset)	\$28,056	\$31,300	HF-related hospital-based encounter charges (mean charge per patient)	Charges
				One year	\$29,153	\$32,524	HF-related hospital-based encounter charges (mean charge per patient)	
				first 30 days (after WCHF onset)	\$33,017	\$36,835	All- cause healthcare cost (HF & non-HF) (mean charge per patient)	

Reference	Population (subgroup)	Sample size (no. with event)	Price/cost year	Follow-up duration	Reported mean cost, \$US	Mean cost, \$US 2019 values	Author's description of categories	Resource use valuation
Henk, 2015[75]	Hyperlipidemia with a HF event	50,660	2012	30 days after initial hospitalization	\$17,644	\$21,195	Medical, inpatient, emergency room, ambulatory, office visit, outpatient visit, other medical, pharmaceutical	
		46,611		1 year minus first 30 days	\$29,672	\$35,643		
		50,660		Year 1	\$45,098	\$54,173	<i>(cost in year 1 including initial hospitalization costs)</i>	
		26,250		Year 2	\$24,860	\$29,863	<i>(cost separately in year 2)</i>	
		14,563		Year 3	\$21,859	\$26,258	<i>(cost separately in year 3)</i>	
Hernández-Madrid, 2019[54]	HFH	58	2016	-	\$15,770	\$16,951	HF hospitalization cost	Costs
Husaini, 2016[65]	HF	57,219	2010	One year	\$76,839	\$98,599	Average hospitalization cost for HF alone: Costs/charges for HF alone (HF cost \$), the amount associated with a patient discharged with HF as a primary diagnosis during the year	Charges
					\$149,020	\$191,221	Total Average hospitalization cost: total hospital cost/charges for the year (Total cost \$) that included HF cost plus the cost for the same patient when he/she was readmitted with diagnoses other than HF.	
		58,544	2007		\$71,995	\$102,214	Average hospitalization cost for HF alone: Costs/charges for HF alone (HF cost \$), the amount associated with a patient discharged with HF as a primary diagnosis during the year	
					\$143,270	\$203,406	Total Average hospitalization cost: total hospital cost/charges for the year (Total cost \$) that included HF cost plus the cost for the same patient when he/she was readmitted with diagnoses other than HF.	

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Inampudi, 2019[66]	ESRD pts on hemodialysis with HFH	812,089	2014	One year	\$8,178	\$9,364	Average annual HF hospitalization cost	Costs
	ESRD pts on peritoneal dialysis with HFH			One year	\$8,248	\$9,444	Average annual HF hospitalization cost	
Jackson, 2018[58]	Primary HF	1,068,412 4,071,546	2014	-	\$44,841	\$51,342	Total charge of HF hospitalization	Charges & Costs using cost to charge ratios
	Primary HF			-	\$11,552	\$13,227	Total cost of HF hospitalization	
	comorbid HF - Asthma			-	\$38,062	\$43,581	Total hospitalization charge	
	comorbid HF - Asthma			-	\$9,691	\$11,096	Total hospitalization cost	
	comorbid HF - COPD			-	\$34,781	\$39,824	Total hospitalization charge	
	comorbid HF - COPD			-	\$9,111	\$10,432	Total hospitalization cost	
	comorbid HF - Pneumonia			-	\$44,977	\$51,498	Total hospitalization charge	
	comorbid HF - Pneumonia			-	\$12,240	\$14,015	Total hospitalization cost	
	comorbid HF - CKD			-	\$40,386	\$46,241	Total hospitalization charge	
	comorbid HF - CKD			-	\$10,782	\$12,345	Total hospitalization cost	
	comorbid HF - Atrial fibrillation or flutter			-	\$42,640	\$48,822	Total hospitalization charge	
	comorbid HF - Atrial fibrillation or flutter			-	\$10,942	\$12,528	Total hospitalization cost	

Reference	Population (subgroup)	Sample size (no. with event)	Price/cost year	Follow-up duration	Reported mean cost, \$US	Mean cost, \$US 2019 values	Author's description of categories	Resource use valuation
	comorbid HF - Diabetes mellitus			-	\$55,272	\$63,286	Total hospitalization charge	
	comorbid HF - Diabetes mellitus			-	\$13,996	\$16,025	Total hospitalization cost	
	comorbid HF - Hypertension			-	\$41,256	\$47,238	Total hospitalization charge	
	comorbid HF - Hypertension			-	\$10,279	\$11,769	Total hospitalization cost	
	comorbid HF - IHD			-	\$98,091	\$112,313	Total hospitalization charge	
	comorbid HF - IHD			-	\$24,091	\$27,584	Total hospitalization cost	
	comorbid HF - Stroke			-	\$66,653	\$76,317	Total hospitalization charge	
	comorbid HF - Stroke			-	\$16,816	\$19,254	Total hospitalization cost	
	comorbid HF - Dementia or Alzheimer			-	\$33,030	\$37,819	Total hospitalization charge	
	comorbid HF - Dementia or Alzheimer			-	\$9,901	\$11,337	Total hospitalization cost	
	comorbid HF - Depression			-	\$26,992	\$30,906	Total hospitalization charge	
	comorbid HF - Depression			-	\$7,600	\$8,702	Total hospitalization cost	
Khurmi, 2018[22]	Liver transplant patients admitted primarily with CHF	1,853	2011	One year	\$10,873	\$13,540	Total hospital cost for HF admission	Costs using cost to charge ratios
	Liver transplant patients admitted primarily with CHF to transplant hospital	1,313			\$12,077	\$15,039		
	Liver transplant patients admitted	540			\$8,777	\$10,930		

Reference	Population (subgroup)	Sample size (no. with event)	Price/cost year	Follow-up duration	Reported mean cost, \$US	Mean cost, \$US 2019 values	Author's description of categories	Resource use valuation
	primarily with CHF to nontransplant hospital							
Kilgore, 2017[85]	HFH	63,678	2015	Follow up of 3 years (36 months)	\$14,631	\$16,323	Average per-patient cost of a single HF-related hospitalization	Costs
				Average per-patient cost of HF-related, CV-related, and all-cause hospitalizations over the observation period for Medicare beneficiaries with HF.	\$16,000	\$17,850	Mean per-patient cost of a single CV-related hospitalization	
					\$15,924	\$17,765	Mean per-patient cost of a single all-cause hospitalization	
Lahewala, 2019[67]	HF admitted in the same hospital HF admitted in different hospital	715,993	2014	30 days	\$13,740	\$15,732	Cost of care of 30-day readmission in the same hospital/ in different hospital	Costs using cost to charge ratios
				30 days	\$22,602	\$25,879		
Lee, 2014[81]	HFH	92,327 ^c	2009	-	\$11,313	\$15,012	Average Inpatient cost for HF	Costs using cost to charge ratios
Mark, 2018[46]	HFrEF on biomarker-guided strategy ^d HFrEF on usual care ^d	735 ^e	2017	Estimates over the available study follow-up	\$47,683	\$50,000	Mean all-cause hospital cost (including physician fees) - all cause (HF and non-HF admissions)	Costs using cost to charge ratios
				Total follow-up: 2 years;	\$34,782	\$36,472		

Reference	Population (subgroup)	Sample size (no. with event)	Price/cost year	Follow-up duration	Reported mean cost, \$US	Mean cost, \$US 2019 values	Author's description of categories	Resource use valuation
	HFrEF on biomarker-guided strategy			median follow up: 15 months; Year 2 costs were discounted at 3%	\$1,286	\$1,348	Mean total costs for Outpatient clinic visit	
	HFrEF on usual care				\$1,144	\$1,200		
	HFrEF on biomarker-guided strategy				\$48,968	\$51,347	Mean total medical costs (inpatient & outpatient), including initial hospitalization	
	HFrEF on usual care				\$35,925	\$37,671		
Obi, 2017[87]	HF decedents	8,344	2013	One year	\$39,052	\$45,784	Mean HF related medical costs over a year follow-up (cumulative) including, ambulatory, emergency services, hospitalization and other medical costs not included in the previous categories	Costs
	HF survivors	8,344		One year	\$16,519	\$19,367	HF related medical costs (per patient per month) including, ambulatory, emergency services, hospitalization and other medical costs not included in the previous categories (per patient per month)	
	HF decedents			30 days	\$16,477	\$19,317		
	HF survivors			30 days	\$1,358	\$1,592		
	HF decedents			One year	\$35,930	\$42,124	Mean HF related hospitalization costs over a year follow-up (cumulative)	
	HF survivors			One year	\$13,544	\$15,879		
	HF decedents			30 days	\$15,272	\$17,905	HF related hospitalization costs (per patient per month)	
	HF survivors			30 days	\$1,113	\$1,305		
	HF decedents			One year	\$60,048	\$70,400	Mean all-cause medical costs over a year follow-up (cumulative) including, ambulatory, emergency services, hospitalization and other medical costs not included in the previous categories	
	HF survivors			One year	\$32,394	\$37,978		

Reference	Population (subgroup)	Sample size (no. with event)	Price/cost year	Follow-up duration	Reported mean cost, \$US	Mean cost, \$US 2019 values	Author's description of categories	Resource use valuation
	HF decedents			30 days	\$21,400	\$25,089	All-cause medical costs (per patient per month) including, ambulatory, emergency services, hospitalization and other medical costs not included in the previous categories	
	HF survivors			30 days	\$2,663	\$3,122		
	HF decedents			One year	\$45,533	\$53,382	Mean all-cause hospitalization costs over a year follow-up (cumulative)	
	HF survivors			One year	\$17,672	\$20,718		
	HF decedents			30 days	\$18,047	\$21,158	HF related hospitalization costs (per patient per month)	
	HF survivors			30 days	\$1,453	\$1,703		
	HF decedents			One year	\$62,036	\$72,730	Mean all-cause healthcare costs over a year follow-up (cumulative) including medical and pharmacy (Total)	
	HF survivors			One year	\$36,426	\$42,705		
	HF decedents			30 days	\$21,759	\$25,510	All-cause healthcare costs (per patient per month) including medical and pharmacy (Total)	
	HF survivors			30 days	\$2,994	\$3,510		
Olchanski, 2018[23]	ADHF	564	2014	One year	\$9,521	\$10,901	Total cost of index HF hospital stay. Cost components include room and board, diagnostics, therapies, pharmacy, ED and overhead costs	Costs
	HFrEF	285			\$10,286	\$11,777		
	HFpEF	259			\$8,858	\$10,142		
Olchanski, 2020[77]	ADHF (HFrEF, HFpEF) with & wo T2DM	544	2015	-	\$9,476	\$10,572	Total cost of index HF hospital stay. Direct cost components included room and board (room and board medical/ surgical, room and board ICU, and dietary/housekeeping services), diagnostics (core blood laboratory, radiation oncology, radiology, MRI, and other ancillary	Costs
	HFrEF with T2DM	124			\$11,576	\$12,915		
	HFrEF wo T2DM	161			\$9,056	\$10,103		
	HFpEF with T2DM	113			\$9,641	\$10,756		

Reference	Population (subgroup)	Sample size (no. with event)	Price/cost year	Follow-up duration	Reported mean cost, \$US	Mean cost, \$US 2019 values	Author's description of categories	Resource use valuation
	HFpEF wo T2DM	146			\$8,026	\$8,954	diagnostic testing), therapies (operating room, electrophysiology laboratory, and cardiac catheterization laboratory), pharmacy, and others (blood bank and emergency department)	
	ADHF (HFrEF, HFpEF) with & wo T2DM	544	2015	-	\$2,199	\$2,453	Total cost per day for Index HF hospital stay	
	HFrEF with T2DM	124			\$2,205	\$2,460		
	HFrEF wo T2DM	161			\$2,115	\$2,360		
	HFpEF with T2DM	113			\$2,411	\$2,690		
	HFpEF wo T2DM	146			\$2,121	\$2,366		
Park, 2015[47]	CHF	458,620 ^f	2011	One year	\$22,498*	\$28,017	Median hospital charge for CHF inpatient care	Charges
Park, 2017[89]	Hypertension with CHF	26,049 ^g	2014	One year	\$17,063	\$19,537	Mean annual total medical expenditures included the total of all expenditures paid by all payers, including Medicare, Medicaid, other public insurance, private insurance, and payments made by the adult with hypertension or that person's family during the calendar year. The expenditures included those for inpatient hospitalizations, outpatient visits, emergency department visits, office-based physician visits, home healthcare visits, and prescription medications.	Costs
Polson, 2017[68]	HF on RAASi optimal dose	3,426	2015	One year	\$12,752*	\$14,226	Median overall medical cost including inpatient, outpatient, office visits, ED visits, medications (pharmacy costs)	Costs
	HF on RAASi suboptimal dose	4,699			\$19,230*	\$21,454		

Reference	Population (subgroup)	Sample size (no. with event)	Price/cost year	Follow-up duration	Reported mean cost, \$US	Mean cost, \$US 2019 values	Author's description of categories	Resource use valuation
	HF no RAASi	4,555			\$18,969*	\$21,162		
	HF & CKD on RAASi optimal dose	184			\$22,672*	\$25,294		
	HF & CKD on RAASi suboptimal dose	507			\$30,956*	\$34,535		
	HF & HK on RAASi optimal dose	11			\$48,403*	\$54,000		
	HF & HK on RAASi suboptimal dose	90			\$33,495*	\$37,368		
	HF & HK no RAASi	144			\$36,923*	\$41,192		
	HF & HK no RAASi	144			\$36,923*	\$41,192		
Punekar, 2015[88]	Hyperlipidemia with a HF, Primary prevention cohort (case group ^b), patient with only 1 HF event	1,541	2013	Patients were followed up to 2 years after the diagnosis of Hyperlipidemia for the assessment of HF events	\$69,771	\$81,799	Mean 2-year total medical costs in the case group: patients with HF-event-related hospitalizations after the index date (i.e., diagnosis of hyperlipidemia)	Costs
	Hyperlipidemia with a HF, Secondary prevention cohort (case group ^b), patient with only 1 HF event	739			\$66,087	\$77,480	Total medical costs include Inpatient, ED visits, office visits, outpatient office visits and pharmacy costs (prescriptions) for patients with only 1 HF event	1 HF event
	Hyperlipidemia with a HF, High risk cohort (case group ^b), patient with only 1 HF event	2,126			\$63,390	\$74,318		
	Hyperlipidemia with a HF, Primary	1,541			\$64,167	\$75,229	Mean 2-year Incremental costs <i>equals</i> all-cause cost for the case	
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Reference	Population (subgroup)	Sample size (no. with event)	Price/cost year	Follow-up duration	Reported mean cost, \$US	Mean cost, \$US 2019 values	Author's description of categories	Resource use valuation
	prevention cohort (incremental ^h), patient with only 1 HF event						(patients with a HF-event) <i>minus</i> all-cause cost for the matched control (patient with no HF-event)	
	Hyperlipidemia with a HF, Secondary prevention cohort (incremental ^h), patient with only 1 HF event	739			\$55,996	\$65,649	Total medical costs attributable to HF event include inpatient, ED visits, office visits, outpatient office visits) and pharmacy costs (prescriptions) for patients with only 1 HF event	
	Hyperlipidemia with a HF, High risk cohort (incremental ^h), patient with only 1 HF event	2,126			\$55,451	\$65,010		
	Hyperlipidemia with a HF, Primary prevention cohort (case group ^h), patient with only 2 HF events	515			\$96,620	\$113,276	Mean 2-year total medical costs in the case group: patients with HF-event-related hospitalizations after the index date (i.e., diagnosis of hyperlipidemia)	2 HF events
	Hyperlipidemia with a HF, Secondary prevention cohort (case group ^h), patient with only 2 HF events	739			\$76,136	\$89,261	Total medical costs include Inpatient, ED visits, office visits, outpatient office visits and pharmacy costs (prescriptions) for patients with only 2 HF events	
	Hyperlipidemia with a HF, High risk cohort (case group ^h), patient with only 2 HF events	848			\$85,251	\$99,947		

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	Hyperlipidemia with a HF, Primary prevention cohort (incremental ^h), patient with only 2 HF events	515			\$90,921	\$106,595	Mean 2-year Incremental costs <i>equals</i> all-cause cost for the case (patients with a HF-event) <i>minus</i> all-cause cost for the matched control (patient with no HF-event)	
	Hyperlipidemia with a HF, Secondary prevention cohort (incremental ^h), patient with only 2 HF events	739			\$65,473	\$76,760	Total medical costs attributable to HF event include inpatient, ED visits, office visits, outpatient office visits) and pharmacy costs (prescriptions) for patients with only 2 HF events	
	Hyperlipidemia with a HF, High risk cohort (incremental ^h), patient with only 2 HF events	848			\$76,976	\$90,246		
	Hyperlipidemia with a HF, Primary prevention cohort (case group ^h), patient with only 3 HF events	204			\$95,393	\$111,838	Mean 2-year total medical costs in the case group: patients with HF-event-related hospitalizations after the index date (i.e., diagnosis of hyperlipidemia)	3 HF events
	Hyperlipidemia with a HF, Secondary prevention cohort (case group ^h), patient with only 3 HF events	739			\$92,482	\$108,425	Total medical costs include Inpatient, ED visits, office visits, outpatient office visits and pharmacy costs (prescriptions) for patients with only 3 HF events	
	Hyperlipidemia with a HF, High risk cohort (case	453			\$101,438	\$118,925		

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	group ⁿ), patient with only 3 HF events							
	Hyperlipidemia with a HF, Primary prevention cohort (incremental ^h), patient with only 3 HF events	204			\$89,004	\$104,347	Mean 2-year Incremental costs equals all-cause cost for the case (patients with a HF-event) minus all-cause cost for the matched control (patient with no HF-event)	
	Hyperlipidemia with a HF, Secondary prevention cohort (incremental ^h), patient with only 3 HF events	739			\$80,646	\$94,548	Total medical costs attributable to HF event include inpatient, ED visits, office visits, outpatient office visits) and pharmacy costs (prescriptions) for patients with only 3 HF events	
	Hyperlipidemia with a HF, High risk cohort (incremental ^h), patient with only 3 HF events	453			\$92,392	\$108,319		
Raju, 2016†[97]	HFH with T2DM	13,966	2015	Index HF hospitalization	\$21,436	\$23,915	HF hospitalization cost	Costs
				Post discharge (post-Index: period duration varies for each patient) ⁱ	\$1,587	\$1,771	Post-discharge HF-related costs (per patient per month) including inpatient, emergency room, physician office, other outpatient care	
				Post discharge (post-Index: period duration varies for each patient) ⁱ	\$7,818	\$8,722	Post-discharge All-cause costs (per patient per month) including inpatient, emergency room, physician office, other outpatient care	
	HFH without T2DM	26,100		Index HF hospitalization	\$20,906	\$23,323	HF hospitalization cost	

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				Post discharge (post-Index: period duration varies for each patient) ⁱ	\$1,383	\$1,543	Post-discharge HF-related costs (per patient per month) including inpatient, emergency room, physician office, other outpatient care	
				Post discharge (post-Index: period duration varies for each patient) ⁱ	\$7,220	\$8,055	Post-discharge All-cause costs (per patient per month) including inpatient, emergency room, physician office, other outpatient care	
Shamliyan, 2019†[49]	HFpEF	-	2016	-	\$10,504	\$11,291	Hospital costs (hospital expenses), cost per discharge	Charges & Costs
					\$41,940	\$45,082	Hospital charges (amount billed to hospital for an entire hospital stay), charge per discharge	
Storrow, 2014[24]	AHF	988,915	2009	One year	21088*	\$27,983	Total charges for admitted patients, including ED and hospital charges	Charges
Tuzovic, 2019[69]	Cancer & HF	64,740	2014	-	\$22,571	\$25,844	Total hospitalization cost with primary oncologic diagnosis and comorbid HF	Costs using cost to charge ratios
Voigt, 2014[25]	SHF (unspecified)		2012	One year	\$11,565	\$13,892	Cost per discharge; cost per case includes inpatient care	Costs, Costs using cost to charge ratios
	SHF (acute)				\$10,434	\$12,534		
	SHF (chronic)				\$18,386	\$22,086		
	SHF (acute on chronic)				\$11,185	\$13,436		
	DHF (unspecified)				\$9,342	\$11,222		
	DHF (acute)				\$9,152	\$10,994		
	DHF (chronic)				\$9,181	\$11,029		
	DHF (acute on chronic)				\$9,459	\$11,362		
	Combined SHF & DHF (unspecified)				\$11,214	\$13,471		

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	Combined SHF & DHF (acute)				\$11,635	\$13,976		
	Combined SHF & DHF (chronic)				\$14,794	\$17,771		
	Combined SHF & DHF (acute on chronic)				\$11,562	\$13,889		
Wadhwa, 2018[70]	HFH	2,948	2016	30 days	\$15,423	\$16,578	30-day Medicare episode payment (per beneficiary) for HF patient admitted in hospital	Payment
Ward, 2014[71]	Diabetes with CHF complication	92,917	2012	One year	\$23,758	\$28,539	Event-year cost per patient refers to costs associated with management of an acute care episode (initial management in an inpatient, emergency department, or outpatient setting) and any subsequent care provided within the first year following the acute episode.	Costs, Costs using cost to charge ratios
				beyond the first year	\$1,904	\$2,287	Annual state cost per patient reflects annual resource use required beyond the first year for the ongoing management of the CHF complication and applies while that particular health state is present for the remainder of the patient's life.	
				One year	\$16,960	\$20,373	Inpatient acute care for CHF complication (mean cost per stay) including physician fees per stay	
Woolley, 2016†[73]	HF with HK	3,789	2015	30 days	\$12,718	\$14,189	30-day total healthcare costs	Costs
				One year	\$69,211	\$77,214	1-year total healthcare costs	
	HF wo HK	3,789		30 days	\$4,391	\$4,899	30-day total healthcare costs	
				One year	\$39,637	\$44,220	1-year total healthcare costs	
Yoon, 2016[76]	HF ^b	117,870	2010	One year	\$30,719	\$39,418	Mean annual costs of Inpatient and outpatient care including medical/	Costs

Reference	Population (subgroup)	Sample size (no. with event)	Price/cost year	Follow-up duration	Reported mean cost, \$US	Mean cost, \$US 2019 values	Author's description of categories	Resource use valuation
	HF ²				\$16,313	\$20,933	surgical, behavioral care/ diagnosis, long-term care, residential/ domiciliary care and pharmacy/ prescription drugs Mean costs of all inpatient care per patient during the year, including medical/ surgical, behavioral care, long-term care, residential/ domiciliary care	
	HF & Hypertension				\$34,179	\$43,858	Mean annual costs of Inpatient and outpatient care including medical/ surgical, behavioral care/ diagnosis, long-term care, residential/ domiciliary care and pharmacy/ prescription drugs	
	HF & IHD				\$36,300	\$46,580		
	HF & Diabetes				\$35,504	\$45,558		
	HF & Renal failure				\$52,385	\$67,220		
	HF & Depression				\$41,803	\$53,641		
	HF& Post-traumatic stress disorder				\$42,440	\$54,458		
	HF & Drug use disorder				\$59,486	\$76,332		
	HF & Alcohol use disorder				\$48,401	\$62,108		
	HF & Other psychiatric disorders				\$53,536	\$68,697		
	HF & Alzheimer's disease				\$36,116	\$46,344		
Ziaean, 2015[72]	AHF	956,745	2011	One year	\$10,775	\$13,418	Total costs per AHF hospitalization episode	Costs using cost to charge ratios

ACEI/ARB: Angiotensin-converting enzyme inhibitor or angiotensin-receptor blocker, ADHF: Acute Decompensated Heart Failure, AHF: Acute heart failure, AKI: Acute kidney injury, AV: Atrioventricular, BIP: Traditional bipolar, CHF: Congestive Heart Failure , CKD: Chronic kidney disease, CRT: Cardiac resynchronization therapy, CRT-D: Cardiac resynchronization therapy defibrillator , CV: Cardiovascular Event, DHF: Diastolic heart failure, ED: Emergency department, ESRD: End-Stage Renal Disease, GP: General practitioner, HF: Heart Failure, HFH: Heart failure hospitalization, HFpEF: Heart Failure with preserved ejection fraction, HFrEF: Heart Failure with reduced ejection fraction, HFS: Heart failure syndrome, HK: Hyperkalemia, HR: High Risk, ICU: Intensive care unit, IHD: Ischemic heart disease, IQL: Interquartile limits, LVAD:

Left ventricular assist devices, NR: Non responders, OHT: Orthotopic heart transplantation, OSA: Obstructive sleep apnea, PAP: Pulmonary artery pressure, PCC: Palliative care consultations, PEM: Protein-Energy Malnutrition, QUAD: Quadripolar, R: Responders, RA: Rheumatoid arthritis, RAASi: renin-angiotensin-aldosterone system inhibitor (agents), SAC/VAL: Sacubitril/ valsartan, SHF: Systolic heart failure, T2DM: Type 2 diabetes mellitus, VA: Veteran Affairs, wo: without

†Abstract, - Not reported/ not applicable, *Median

^aFor these years, authors describe data in terms of financial year, e.g. 2012/2013 was adjusted to 2013, 2013/2014 was adjusted to 2014, 2010/2011 was adjusted to 2011

^bUS Veteran Health administration population

^c92,327 hospitalizations (population estimate = 976,664); hospitalizations (and not patient) were used as the unit of analysis

^dBiomarker-guided strategy: NT-proBNP-guided heart failure treatment strategy (target NT-proBNP level <1000 pg/mL); Usual care: optimal medical therapy

^eA total of 894 patients were enrolled at 45 clinical sites in the United States and Canada between January 2013 and study termination in July 2016. The economic study included the subset of 735 patients in the United States with sites that provide hospital billing data, and it excluded 159 patients who were either enrolled in sites not participating in the economic study (n=21) or enrolled in Canada (n=138).

^f2,653 US acute care hospitals; and 458,620 total discharges for CHF (and not patient) were used for analysis.

^gU.S. Hypertensive Adults, 2011–2014 Medical Expenditure Panel Survey (n=26,049); Number of patients per comorbidity group are not reported.

^hIncremental costs *equals* all-cause cost for the case (patients with an event) *minus* all-cause cost for the matched control (patient with no event); Mean 2-year total costs in the Case group: patients with HF-event-related hospitalizations after the index date (the case group); Mean 2-year total costs in the Control group: patients with no CV-event-related hospitalization (the control group)

ⁱDue to variable follow-up for each patient, outcomes were reported per patient per month (where applicable) by summing them over each patient's duration of follow-up, dividing by their days of follow-up, and multiplying by 30.

Notes:

Charges refer to the initial, individual list prices a US hospital typically sets for the services it provides. *Costs* are the actual expenses incurred by a hospital in providing patient care (including the direct costs of patient care such as nursing, room and board, medicines and supplies; as well as overhead costs for administration etc.). *Payment* is the amount a hospital actually receives for providing patient care from the government (e.g., Medicare and Medicaid), private insurers, and sometimes the patients themselves. In some studies, *Costs* were calculated using hospital-specific cost-to-charge ratios (CCR) provided by the Centers for Medicare and Medicaid Services or the Healthcare Cost and Utilization Project (HCUP) CCR files.