Supplemental Table S1: International Classification of Disease 9th Revision (ICD-9) Codes for the study cohort.

ICD-9 Diagnosis and Procedure Codes	
Cervical cancer	180
Uterine cancer	179, 182
Vaginal cancer	1840
Vulvar cancer	1841, 1842, 1843, 1844
Lymphadenectomy	400, 401, 4024, 4029, 403, 4052, 4053, 4054, 4059, 409
Colostomy	460, 461, 462, 463, 464, 466
Urinary diversion	565, 566, 567
Vaginal reconstruction	706
Transverse rectus myocutaneous flap	8572, 8573
History of chemotherapy	V5811, V672, V8741
History of other malignancy	See codes for CC14
History of metastatic disease	See codes for CC16
Obesity	27800, 27801
Postoperative Complications	
Bladder injury	8670, 8671
Urethral injury	8672, 8673
Intestinal injury	8632, 8633, 8634, 8635, 8628
Vascular injury	9020, 9021, 9022, 9023, 9024, 9025, 9028, 9029, 9049
Postoperative hemorrhage	99811, 9582, 2851
Postoperative shock	9980, 9954
Wound complications	9583, 99812, 99813, 9983, 9985, 99883
Venous Thromboembolism/Pulmonary	452, 453, 4151, 4162
Cerebrovascular Accident	4329, 433, 434, 435, 436, 437
Myocardial Infarction	410
Pneumonia	480, 481, 482, 483, 484, 485, 486
Respiratory Failure	5184, 5185, 5188
Systemic Inflammatory Response	9959
Ileus/Small Bowel Obstruction	5601, 5603, 5608, 5609
Heart failure	39891, 40201, 40211, 40291, 40401, 40403, 40411, 40413, 40491, 40493, 4280, 4281, 42820, 42821, 42822, 42823, 42830, 42831, 42832, 42833, 42840, 42841, 42842, 42843, 4289
Pyelonephritis	590
Intestinal perforation	56983
Abscess	56722, 56731, 56738, 5695
Fistula	5651, 56981, 59382, 5961, 5962, 5991, 619
AKI	584
Charlson Comorbidity Index	
CC1: Myocardial Infarction	410, 411, 412
CC2: Congestive Heart Failure	39891, 40201, 40211, 40291, 40401, 40403, 40411, 40413, 40491, 40493, 4254, 4255, 4357, 4258, 4259, 428

CC3: Peripheral Vascular Disease	0930, 4373, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 451, 452, 453, 454, 455, 456
CC4: Cerebrovascular Disease	3623, 430, 431, 432, 433, 434, 435, 436, 437, 438
CC5: Dementia	290, 294, 331
CC6: Chronic Pulmonary Disease	415, 416, 490, 491, 492, 493, 494, 495, 496, 500, 501, 502, 503, 504, 505, 506, 507, 508, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519
CC7: Connective Tissue Disease	710, 711, 712, 713, 714, 715, 716
CC8: Peptic Ulcer Disease	531, 532, 533, 534, 535
CC9: Mild Liver Disease	0701, 0703, 0705, 07070, 0709, 5710, 5713, 5714, 5716, 5718, 5719, 5731, 5732, 5733, 5738, 5739
CC10: Diabetes without complications	2490, 2500
CC11: Diabetes with complications	2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509
CC12: Paraplegia and hemiplegia	3341, 342, 343, 344
CC13: Renal disease	403, 404, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593
CC14: Cancer	140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 170, 171, 172, 173, 174, 175, 176, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209
CC15: Moderate or Severe Liver Disease	4560, 4561, 4562, 570, 5711, 5712, 5715, 572, 5730, 5734, 5735, V427, 99682
CC16: Metastatic Carcinoma	196, 197, 198, 199
CC17: HIV/AIDS	042, 07953, 79571, V08

Supplemental Table S2. Medical inflation rate for total charge.

Year	Annual inflation rate (%)	Percent change to 2015
2001	3.59	63.79
2002	3.50	56.43
2003	3.46	50.37
2004	3.37	44.05
2005	3.29	38.21
2006	3.21	32.88
2007	3.06	27.26
2008	2.97	22.71
2009	2.93	18.94
2010	2.84	15.01
2011	2.79	11.62
2012	2.49	7.67
2013	2.51	5.08
2014	2.63	2.63

Medical inflation rate at the time of surgery was corrected for interval percent change to 2015 value.

Supplemental Table S3. Patient demographics (cervical cancer).

Characteristic	All	2001-2005	2006-2010	2011-2015	P-value
Number	n=1,194	n=347	n=437	n=410	
Age (yr)	50 (IQR 42-56)	48 (IQR 39-56)	51 (IQR 43-56)	51 (IQR 40-58)	0.109
<50	584 (48.9%)	194 (55.9%)	197 (45.0%)	193 (47.2%)	
50-69	553 (46.3%)	130 (37.5%)	226 (51.6%)	197 (48.2%)	
≥70	57 (4.8%)	23 (6.6%)	15 (3.4%)	19 (4.6%)	
Race/ethnicity					**<0.001**
White	669 (56.0%)	199 (57.3%)	238 (54.5%)	232 (56.6%)	
Black	134 (11.2%)	23 (6.6%)	48 (11.0%)	63 (15.4%)	
Hispanic	159 (13.3%)	22 (6.3%)	71 (16.2%)	66 (16.1%)	
Others	59 (4.9%)	15 (4.3%)	19 (4.3%)	25 (6.1%)	
Missing	173 (14.5%)	88 (25.4%)	61 (14.0%)	24 (5.9%)	
Obesity					**
No	1,083 (90.7%)	338 (97.4%)	399 (91.3%)	346 (84.4%)	
Yes	111 (9.3%)	*	38 (8.7%)	64 (15.6%)	
Charlson Index					**<0.001**
0	536 (44.9%)	175 (50.4%)	202 (46.2%)	159 (38.8%)	
1	232 (19.4%)	91 (26.2%)	56 (12.8%)	85 (20.7%)	
2	138 (11.6%)	19 (5.5%)	81 (18.5%)	38 (9.3%)	
3-5	116 (9.7%)	14 (4.0%)	28 (6.4%)	74 (18.0%)	
≥6	172 (14.4%)	48 (13.8%)	70 (16.0%)	54 (13.2%)	
Median household income					**<0.001**
≤$38,999	290 (24.3%)	60 (17.2%)	137 (31.4%)	93 (22.7%)	
$39,000-$47,999	330 (27.6%)	100 (28.7%)	123 (28.2%)	107 (26.1%)	
$48,000-$62,999	308 (25.8%)	94 (27.0%)	95 (21.8%)	119 (29.0%)	
≥$63,000	209 (17.5%)	81 (23.3%)	62 (14.2%)	66 (16.1%)	
Missing	57 (4.8%)	13 (3.7%)	19 (4.4%)	25 (6.1%)	
Primary expected payer					**
Medicare	137 (11.5%)	35 (10.1%)	33 (7.6%)	69 (16.8%)	
Medicaid	411 (34.4%)	97 (27.9%)	171 (39.2%)	143 (34.9%)	
Private including HMO	555 (46.5%)	198 (56.9%)	169 (38.8%)	188 (45.9%)	
Others/missing	91 (7.6%)	18 (5.2%)	63 (14.4%)	*	
Hospital bedsize					0.560
Small	91 (7.7%)	24 (6.9%)	32 (7.3%)	35 (8.7%)	
Medium	197 (16.6%)	52 (14.9%)	81 (18.5%)	64 (15.8%)	
Large	901 (75.8%)	272 (78.2%)	324 (74.1%)	305 (75.5%)	
Hospital teaching status					**
Rural	*	*	*	*	
Urban Non-Teaching	119 (10.0%)	48 (13.8%)	32 (7.3%)	39 (9.7%)	
Urban Teaching	1,063 (89.6%)	294 (84.7%)	404 (92.7%)	365 (90.3%)	
Hospital region					**<0.001**
Northeast	153 (12.8%)	37 (10.7%)	47 (10.8%)	69 (16.9%)	
Midwest	218 (18.3%)	80 (23.1%)	67 (15.3%)	71 (17.4%)	
South	525 (44.0%)	173 (49.9%)	205 (46.9%)	147 (35.9%)	
West	297 (24.9%)	57 (16.4%)	118 (27.0%)	122 (29.8%)	

Median (IQR) or number (percent per column) is shown. Kruskal-Wallis *H* test or chi-square test for *P*-values. Significant *P*-values are emboldened. *indicated number of ≤10, required to suppress per the Healthcare Cost and Utilization Project. **not assessed due to suppressed number.

Supplemental Table S4. Surgical performance and perioperative outcome of pelvic exenteration (cervical cancer).

Characteristic	All	2001-2005	2006-2010	2011-2015	P-value
Number	n=1,194	n=347	n=437	n=410	
Lymphadenectomy					**0.026**
No	656 (54.9%)	175 (50.4%)	235 (53.8%)	246 (60.0%)	
Yes	538 (45.1%)	172 (49.6%)	202 (46.2%)	164 (40.0%)	
Colostomy					0.363
No	442 (37.0%)	128 (36.9%)	172 (39.4%)	142 (34.6%)	
Yes	752 (63.0%)	219 (63.1%)	265 (60.6%)	268 (65.4%)	
Urinary diversion					**0.020**
No	168 (14.1%)	62 (17.9%)	62 (14.2%)	44 (10.8%)	
Yes	1,025 (85.9%)	285 (82.1%)	375 (85.8%)	365 (89.2%)	
Vaginal reconstruction					0.235
No	892 (74.7%)	270 (77.6%)	326 (74.8%)	296 (72.2%)	
Yes	302 (25.3%)	78 (22.4%)	110 (25.2%)	114 (27.8%)	
Complication (any)					**<0.001**
0	536 (44.9%)	175 (50.4%)	202 (46.2%)	159 (38.8%)	
1	232 (19.4%)	91 (26.2%)	56 (12.8%)	85 (20.7%)	
2	138 (11.6%)	19 (5.5%)	81 (18.5%)	38 (9.3%)	
≥3	116 (9.7%)	14 (4.0%)	28 (6.4%)	74 (18.0%)	
Death					**
No	1,184 (99.2%)	347 (100%)	432 (98.9%)	405 (98.8%)	
Yes	*	*	*	*	
Length of stay (day)					**0.004**
<28	970 (81.2%)	291 (83.6%)	367 (84.2%)	312 (76.1%)	
≥28	224 (18.8%)	57 (16.4%)	69 (15.8%)	98 (23.9%)	
Total charge (crude)	$120,606 (IQR 73,399-210,837)	$79,870 (IQR 58,327-196,684)	$128,890 (IQR 87,003-210,503)	$170,334 (IQR 140,217-269,958)	**<0.001**
Total charge (corrected)†	$148,766 (IQR 95,708-262,592)	$119,062 (IQR 84,020-171,696)	$159,917 (IQR 106,761-242,592)	$178,987 (IQR 109,511-290,664)	**<0.001**

Median (IQR) or number (percent per column) is shown. Kruskal-Wallis H test or chi-square test for P-values. Significant P-values are emboldened. *indicated number of ≤10, required to suppress per the Healthcare Cost and Utilization Project. **not assessed due to suppressed number. †converted to 2015 value based on medical inflation rate (Table S2).

Supplemental Table S5. Salient demographics per cancer type (post-hoc analysis).

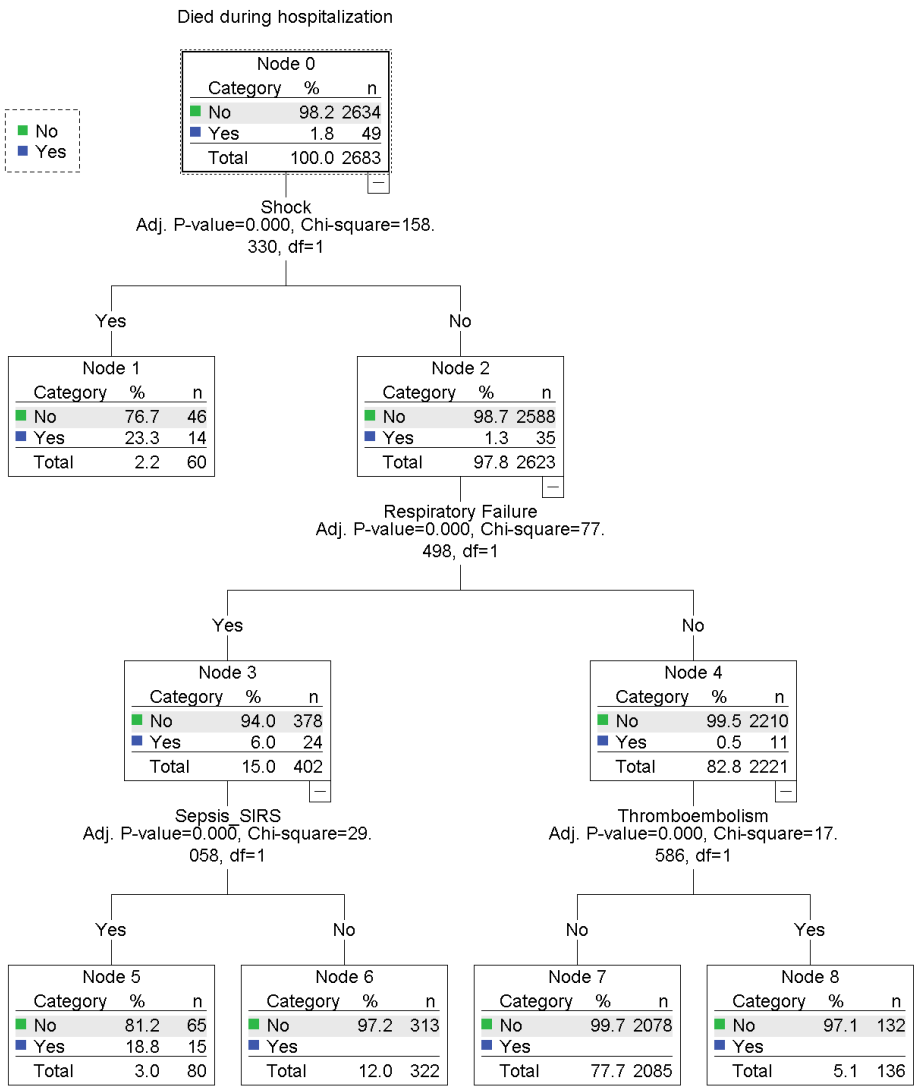| Characteristic	Cervical	Uterine	Vaginal	Vulvar	P-value
Age	50 (IQR 42-56)	64 (IQR 54-72)	61 (IQR 54-69)	65 (IQR 55-71)	**<0.001**
<50	583 (48.9%)	62 (15.7%)	118 (16.4%)	28 (8.5%)	
50-69	553 (46.4%)	222 (56.3%)	439 (60.2%)	196 (59.6%)	
≥70	57 (4.8%)	110 (27.9%)	172 (23.6%)	105 (31.9%)	
Obesity					**<0.001**
No	1,083 (90.7%)	333 (84.3%)	628 (86.1%)	298 (90.9%)	
Yes	111 (9.3%)	62 (15.7%)	101 (13.9%)	30 (9.1%)	
Charlson Index					**<0.001**
2	546 (45.8%)	144 (36.5%)	314 (43.0%)	95 (29.0%)	
3-4	359 (30.1%)	97 (24.6%)	247 (33.8%)	137 (41.8%)	
5-8	216 (18.1%)	87 (22.0%)	123 (16.8%)	53 (16.2%)	
9-15	72 (6.0%)	67 (17.0%)	46 (6.3%)	43 (13.1%)	

Median (IQR) or number (percent per column) is shown. Kruskal-Wallis *H* test or chi-square test for *P*-values. Significant *P*-values are emboldened. *indicated number of ≤10, required to suppress per the Healthcare Cost and Utilization Project. **not assessed due to suppressed number.

Supplemental Figure S1. Regression-tree model for death during index admission.

Died during hospitalization

Node 0		
Category	%	n
■ No	98.2	2634
■ Yes	1.8	49
Total	100.0	2683

Legend:
■ No
■ Yes

Shock
Adj. P-value=0.000, Chi-square=158.330, df=1

Yes

Node 1		
Category	%	n
■ No	76.7	46
■ Yes	23.3	14
Total	2.2	60

No

Node 2		
Category	%	n
■ No	98.7	2588
■ Yes	1.3	35
Total	97.8	2623

Respiratory Failure
Adj. P-value=0.000, Chi-square=77.498, df=1

Yes

Node 3		
Category	%	n
■ No	94.0	378
■ Yes	6.0	24
Total	15.0	402

No

Node 4		
Category	%	n
■ No	99.5	2210
■ Yes	0.5	11
Total	82.8	2221

Sepsis_SIRS
Adj. P-value=0.000, Chi-square=29.058, df=1

Thromboembolism
Adj. P-value=0.000, Chi-square=17.586, df=1

Yes

Node 5		
Category	%	n
■ No	81.2	65
■ Yes	18.8	15
Total	3.0	80

No

Node 6		
Category	%	n
■ No	97.2	313
■ Yes		
Total	12.0	322

No

Node 7		
Category	%	n
■ No	99.7	2078
■ Yes		
Total	77.7	2085

Yes

Node 8		
Category	%	n
■ No	97.1	132
■ Yes		
Total	5.1	136

Regression-tree models for death during the index admission are shown for complication types. Empty boxes indicated numbers of ≤10, required to suppress per the Healthcare Cost and Utilization Project.

Supplemental Figure S2. Box plots for crude total charge per year.