

Do Not Resuscitate Orders and Outcomes for Patients with Pancreatic Cancer

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Abstract

Background: The impact of do-not-resuscitate (DNR) order on patients with pancreatic cancer remains uncertain. In this study, we evaluated whether DNR status was associated with in-hospital mortality and costs for the inpatient stay among patients hospitalized with pancreatic cancer.

Methods: Data were from the National Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCUP), and included 40,246 pancreatic cancer admissions between 2011 and 2016. Mortality was modeled using a logistic regression model; costs for the inpatient stay were modeled using a multivariable generalized linear regression model.

Results: The sample included 6,041 (15%) patients with a documented DNR. After controlling for covariates, patients with a DNR order had approximately 6 times greater odds of mortality compared to patients without a DNR order (OR 5.90, $p < 0.0001$). Compared to patients without a DNR order who survived during the hospital stay, patients with a DNR order who died during the hospital stay had significantly lower costs (-US\$983; $p = 0.0270$), and patients without a DNR order who died during the hospital stay had significantly higher costs (US\$5,638; $p < 0.0001$). Patients with a DNR order who survived had costs that were not significantly different from patients without a DNR order who survived.

Conclusions: The presence of a DNR order among patients with pancreatic cancer was significantly associated with higher mortality risk, as well as lower costs for the patients who died during the hospital stay. However, DNR status was not significantly associated with costs for patients with pancreatic cancer who were discharged alive.

Introduction

Documenting end-of-life (EOL) care preferences is important for patients with serious illnesses. Engaging in advance care planning—having discussions with family, caregivers, and clinicians about their preferences for EOL care—has been shown to improve quality of life for patients and their families [1-3]. Do-not-resuscitate (DNR) orders provide a mechanism to preserve patient autonomy by documenting a preference to withhold cardiopulmonary resuscitation (CPR) in the event of cardiopulmonary arrest, and can be an essential part of an advance care plan [3-7]. Importantly, a DNR order has no effect on any curative treatment besides CPR [5, 6].

Some previous studies have reported that DNR orders are associated with higher mortality but better reported quality of life [7-10]. Less was known about trends in the use of DNR orders and the relationship between DNR orders and outcomes among patients with high mortality conditions such as pancreatic cancer, which was the fourth leading cause of cancer mortality in both men and women in the United States (U.S.) in 2020 [11-15]. According to the American Cancer Society, all stages combined overall 5-year relative survival rate for pancreatic cancer is approximately 10% [15, 16]. Yet, almost half of these patients are not diagnosed until late in the course of the illness, which leads to a worse prognosis and a 5-year relative survival rate of only 4% [15-19]. Therefore, DNR orders may be especially important for

patients with a pancreatic cancer diagnosis. Even though previous studies have shown DNR orders appear to lower hospitalization costs in the last week of life among patients with advanced cancer, there may be differences in cost savings across cancer sites [9, 20, 21]. Furthermore, high healthcare costs accompany advanced cancer throughout the entire inpatient stay. Thus, total hospitalization costs of an inpatient stay potentially provide a better understanding of the association with DNR orders than costs in just the last week of life.

Our primary objective was to use national data to examine whether DNR status has a significant association with in-hospital mortality and costs for the inpatient stay among hospitalized patients with pancreatic cancer. In this study, we estimate trends in DNR utilization among patients with pancreatic cancer, and we report the preoperative characteristics in patients with a DNR order, as well as their mortality and costs compared with those of patients without a DNR order. We hypothesized that the proportion of patients with a DNR order would increase annually, and that DNR orders among patients with pancreatic cancer would be associated with significantly higher mortality risk, together with significantly lower costs for the inpatient stay for the patients who died during the hospital stay.

Methods

Data Sources

Data for this study were from the 2011-2016 National Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and Quality (AHRQ) [22]. The dataset, which includes more than 1,000 hospitals, approximates a 20 percent stratified sample of all discharges from U.S. community hospitals, and is the largest publicly available, all-payer inpatient health care database in the U.S. [22].

Cohort

This study examined a cohort of patients hospitalized with a principal diagnosis of pancreatic cancer. Pancreatic cancer was identified using principal International Classification of Diseases, 9th or 10th Revision, Clinical Modification (ICD-9-CM or ICD-10-CM) diagnosis codes for pancreatic cancer (ICD-9-CM: 157.X and ICD-10-CM: C25.X). We initially identified included 44,268 pancreatic cancer patients admitted between 2011 and 2016 in the NIS data. We focused on adults and excluded 4,022 patients with missing covariates. After all exclusion criteria were applied, the final study sample included 40,246 patients (Figure 1).

Outcomes

This study examined two outcomes: in-hospital mortality and costs. Mortality was defined as death during hospitalization prior to discharge. Costs represented the total hospitalization costs for the inpatient stay from admission to discharge or death. Costs were estimated using hospital specific cost-to-charge ratio (CCR) methodology that estimated costs as a percentage of hospital charges and sum all

departmental costs [23]. In addition, costs were inflated to 2018 U.S. dollars using the medical care component of the Consumer Price Index [24].

Covariates

The primary covariate of interest was an indicator of whether the patient had a DNR order. DNR was identified using ICD-9-CM code V49.86 or ICD-10-CM code Z66 [25, 26]. We controlled for several other covariates in the study, including demographic characteristics (age, sex, and race/ethnicity), the Charlson comorbidity index (CCI) (score of 0-2, 3-5, 6-8, and ≥ 9), location of tumor (head, body, tail, other specified sites, and part unspecified), primary payer (Medicare, Medicaid, commercial, and other), admission type (elective or non-elective), teaching hospital status (rural non-teaching, urban non-teaching, and urban teaching), region of the country (Northeast, Midwest, South, and West), an indicator for surgery during the admission, and indicators for year of admission (2011 to 2016) to control for other secular trends.

Statistical Analysis

The statistical analysis was designed to determine whether there was a significant association between DNR status and in-hospital mortality or in-hospital costs among patients diagnosed with pancreatic cancer. Comparisons of demographics and other patient and disease characteristics were made between patients with and without a DNR order using t-tests for continuous variables and chi-squared tests for categorical variables. A logistic regression model was used to estimate the association between DNR status and in-hospital mortality, after controlling for all the aforementioned covariates. Odds ratios were reported from the logistic regression model. Costs were modeled using a multivariable generalized linear regression model that assumed a gamma family of distributions and a log link function [27, 28]. This model was chosen to account for the skewness in cost data following the health care cost literature. All statistical analyses were performed using Stata (version 16, StataCorp LLP, College Station, TX, USA). Statistical significance for all analyses was defined by p values < 0.05 .

Results

Descriptive Statistics

Of the 40,246 hospitalized pancreatic cancer patients included in this study, 6,041 (15%) had a DNR order. Patients with a DNR order had an unadjusted 25.2% in-hospital mortality versus 4.5% for patients without a DNR order. The mean unadjusted costs for patients with a DNR order were \$15,217 and \$22,622 for patients without a DNR order.

Patient characteristics stratified by DNR status are shown in Table 1. Across all factors, we found significant differences between patients with a DNR order and those without. Patients with a DNR order were significantly older than patients without a DNR order (72.5 versus 67.4 years, $p < 0.0001$) and more likely to be female (52.7% versus 49.3%, $p < 0.0001$). Patients with a DNR order had a higher comorbidity burden as measured by a higher CCI score (7.27 versus 6.04, $p < 0.0001$). They were also more likely to

have Medicare as a primary payer (64.3% versus 56.3%, $p < 0.0001$) and more likely to be treated in a rural non-teaching hospital (6.4% versus 4.5%, $p < 0.0001$) or urban non-teaching hospital (28.3% versus 23.5%, $p < 0.0001$). Notably, the proportion of patients with a DNR order increased annually from 12.9% in 2011 to 21.1% in 2016 ($p < 0.0001$), as shown in Figure 2.

Association Between DNR and Mortality

The results of the logistic regression model of in-hospital mortality are presented in Table 2. After controlling for all covariates, patients with a DNR order had approximately 6 times greater odds of mortality compared to patients without a DNR order (OR 5.90, 95% CI 5.41-6.42, $p < 0.0001$). In addition, several other patient characteristics were associated with mortality based on logistic regression model with all covariates included. Women had a significantly lower risk of mortality compared to men (OR 0.79, 95% CI 0.73-0.86, $p < 0.0001$). Patients who were non-Hispanic Black had significantly higher odds of mortality compared to non-Hispanic white (OR 1.24, 95% CI 1.10-1.39, $p < 0.0001$) patients. Additionally, patients who had a CCI of 6-8 or 9 or greater had significantly greater risk of mortality (OR 1.35, 95% CI 1.18-1.54, $p < 0.0001$ and OR 1.46, 95% CI 1.29-1.66, $p < 0.0001$, respectively). Tumor of tail and other sites of the pancreas had significantly higher odds of mortality compared to tumor of head of pancreas (OR 1.27, 95% CI 1.07-1.51, $p = 0.0060$ and OR 1.63, 95% CI 1.40-1.90, $p < 0.0001$, respectively). Medicare was associated with a significantly lower risk mortality ($p < 0.0001$). Patients treated at rural (OR 2.38, 95% CI 2.06-2.74, $p < 0.0001$) and urban nonteaching hospitals (OR 1.27, 95% CI 1.16-1.39, $p < 0.0001$) had significantly higher risk of mortality than patients treated at urban teaching hospitals.

Association Between DNR and Costs for the Inpatient Stay

Results from the generalized linear model estimates of costs are presented in Table 3. The model captured the interaction between DNR orders and mortality and showed that patients with a DNR order who died in the hospital had significantly lower costs (-US\$983; 95% CI -1,855 to -111; $p = 0.0270$) compared to patients with no DNR who survived. Conversely, compared to patients with no DNR who survived, patients without a DNR order who died had significantly higher costs (US\$5,638; 95% CI 4,479-6,797; $p < 0.0001$). Patients with a DNR order who survived had costs that were not significantly different from patients without a DNR order who survived. There were several other covariates that were associated with costs. Patients over 60 years of age had significantly lower costs relative to those of younger age, and this difference increased with age. Women had a significantly lower costs relative to men (-US\$622; 95% CI -970 to -274; $p < 0.0001$). Race/ethnicity was significantly associated with costs with all racial/ethnic groups experiencing higher costs relative to non-Hispanic white patients including: non-Hispanic Black patients (US\$1,187; 95% CI 1,322-2,451; $p < 0.0001$), Hispanic patients (US\$954; 95% CI 265-1,643; $p = 0.0070$), Asian patients (US\$2,120; 95% CI 1,016-3,225; $p < 0.0001$), and other race/ethnicity (US\$2,444; 95% CI 1,314-3,574; $p < 0.0001$) groups had significantly higher costs compared to non-Hispanic White patients. Location of tumor was significantly associated with costs; patients with a tumor in the body or tail of the pancreas had significantly lower costs of US\$2,967 and US\$4,099, respectively, compared to patients with tumors on the head of the pancreas, both $p < 0.0001$. Commercially

insured patients had lower costs than Medicare patients (-US\$1,234; 95% CI -1,717 to -750; $p < 0.0001$). Patients that had a surgery during admission had significantly higher costs of US\$23,874 compared to patients who did not have a surgery (95% CI 22,926-24,822, $p < 0.0001$).

Discussion

This study showed that, between 2011 and 2016, approximately 15 percent of patients with pancreatic cancer had a DNR order documented with an ICD-9 or ICD-10 diagnosis code in the discharge data, and that the proportion of patients with a DNR order grew steadily from 2011 to 2016. We also showed that the presence of a DNR order among patients with pancreatic cancer was significantly associated with higher in-hospital mortality risk, as well as lower costs for the inpatient stay for the patients who died during the hospital stay. However, DNR status was not significantly associated with costs for patients with pancreatic cancer who were discharged alive. Importantly, we provide the first estimates using nationally representative data and that includes the recent, sharp increase in use of DNR orders.

To our knowledge, this is the first observational study using national, administrative discharge data to evaluate the association between DNR orders and outcomes among patients with pancreatic cancer. In our study, patients with a DNR had 6 times higher odds of mortality relative to those who did not have a documented DNR order. This finding is consistent with previous studies, which have shown that risk of mortality for patients with a DNR order was higher than patients without a DNR order [3, 7, 29-31]. Hanson et al. performed a consecutive prospective cohort study on patients with stage IV cancer and concluded that patients with a DNR order had a 4 times higher risk of mortality than patients without a DNR order in a single site study [29]. In addition, Walsh et al. conducted a retrospective analysis and found patients with a DNR order had 2.5 times greater odds of incidence of postoperative mortality compared to patients without a DNR order albeit with data restricted to surgeries and with older data that does not capture the large increase in DNR orders in the latter parts of our data [7]. Furthermore, a retrospective review performed by Marcia et al. reported DNR orders were associated with higher than 9 times mortality among advanced cancer patients using single site data [3].

We also found pancreatic cancer patients who died with a DNR order had significantly lower costs for the inpatient stay of US\$983 compared to patients without a DNR order who survived to discharge. There are very few studies that have measured the association between DNR orders and costs [10]. Maksud et al. performed a retrospective chart review that ascertained the rates of DNR orders and their associated costs, which yielded similar results with us although their results are from nearly 30 years ago [10]. They found patients with a DNR order obtained in hospital have significantly lower total hospital charges than patients without a DNR order [10]. Recent studies were more likely to report costs of care in the week or the month before death as the main outcome to exam the association between DNR orders and costs [9, 20, 21, 32]. A comprehensive evaluation conducted by Garrido and colleagues had estimated healthcare costs among advanced cancer patients and DNR status and did not find a significant difference between DNR orders and costs of care received in the week before death [9]. However, it was relatively small, single-site study, and their conclusion may have limited generalizability [9]. Patel et al. conducted a

retrospective analysis in a single Veterans Affairs health care system site among patients with stage III or IV or recurrent cancer and found that advanced cancer patients who died with a stated EOL preference document had significantly lower total health-care costs within 30 days of death, compared to patients who died without a stated EOL preference document [20, 21]. However, this difference was not significant if the window was extended to total health-care costs within fifteen months [20, 21]. The strength of our finding of cost savings associated with DNR in pancreatic cancer may in part be explained by the relatively late stage at diagnosis for many patients, the fact that surgery is often not curative, and the general poor prognosis for these patients relative to other types of advanced cancer [15-17]. Therefore, a DNR effect may be more pronounced in our population relative to earlier studies focused on other cancer sites.

Finally, the “failure to rescue” phenomenon has been previously discussed that a DNR order may have negative effects on other curative treatments [5]. Our analysis confirmed that patients with a DNR who survived to discharge had no significant differences in costs compared to patients who did not have a DNR order and survived to discharge. A study by Brovman et al. also provided evidence that there was no significant difference in the incidence of 30-day complications between patients with and without a DNR order [5].

This study has a variety of limitations. First, tumor stage was not available in the data set, therefore we could not restrict to only patients with the most advanced disease. However, pancreatic cancer is usually diagnosed at later and more difficult-to-treat stages, and it has a poor prognosis so there tends to be limited heterogeneity in severity among pancreatic cancer patients, at least relative to many other cancer types [12-14, 33-37]. Second, our measure of costs included only one inpatient stay. This may underestimate all cost savings that may be potentially attributable to DNR orders because costs of patients with hospital transitions or multiple visits cannot be fully estimated using this dataset. However, patients with pancreatic cancer likely have limited rates of transition because of the illness severity. Third, there may be other unmeasured confounders not available in the data set that could partially explain the differences between DNR orders and costs such as education level and income. Fourth, our DNR orders were measured by ICD 9 or ICD 10 diagnosis code, which might not fully capture the range of patient and family preferences, as well as other types of DNR (on-admission or postadmission). However, the presence of a DNR order in the medical record suggested that it is recorded and therefore providers are likely aware of it.

Despite these limitations, our study fills important gaps in understanding the use of DNR orders among patients with pancreatic cancer. We identified DNR orders in discharge data which allows for other population-level studies, extending the generalizability of results. In addition, the total costs in this study reflect the value of the resources used by health care providers. Therefore, the dataset allows for a reasonable way to examine the association between DNR orders and costs among pancreatic cancer patients. No previous study that we could find had this association on a specific cancer site using national data.

Conclusions

This study demonstrates that, among patients hospitalized with pancreatic cancer, a DNR order was associated with higher mortality and lower costs, but DNR status had no significant association with costs for patients who survived to discharge. In addition to assuring that patients with pancreatic cancer receive the care they prefer, DNR orders result in lower resource utilization. Results of this study should inform policymakers, administrators, and healthcare providers to consider providing specific guidelines for having advance care planning discussions, including discussions about DNR orders, with patients with pancreatic cancer. Future research is needed to examine the impact of tumor stage as a moderating variable, and to extend the time horizon of costs beyond a single inpatient episode. In addition, DNR orders associated with costs could vary across cancer sites and other diseases; future research could examine the effect of the DNR orders on other advanced cancers or terminal chronic diseases.

Abbreviations

EOL: end-of-life; DNR: Do-not-resuscitate; CPR: Cardiopulmonary resuscitation; HCUP: Healthcare Cost and Utilization Project; AHRQ: Agency for Healthcare Research and Quality; CCR: Cost-to-charge ratio; CCI: Charlson comorbidity index; OR: odds ratio; CI: Confidence Interval.

Declarations

Acknowledgements:

Not applicable.

Authors' contributions:

Qiang Hao, Joel E. Segel, Niraj J. Gussani, and Christopher S. Hollenbeak conceived and designed the study. Qiang Hao and Christopher S. Hollenbeak wrote the manuscript and arranged the figures and tables. Joel E. Segel, Niraj J. Gussani, and Christopher S. Hollenbeak contributed to reviewing and editing the paper. All authors read and approved the final manuscript.

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Availability of data and materials:

The data that support the findings of this study are available from the 2011-2016 National Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and

Quality (AHRQ).

Ethics approval and consent to participate:

This study was deemed exempt by the Pennsylvania State University institutional review board (IRB).

Consent for publication:

Not applicable.

Competing interests:

None.

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Tables

Tables 1. Patient characteristics based on DNR status

	DNR	No DNR	
Variable	(N=6,041)	(N=34,205)	<i>p</i> value
Age	72.5	67.4	<0.0001
19-59	16.5%	25.6%	
60-69	23.0%	30.5%	
70-79	27.0%	27.1%	
≥80	33.5%	16.8%	
Sex			<0.0001
Female	52.7%	49.3%	
Male	47.3%	50.7%	
Race/Ethnicity			0.2400
White Non-Hispanic	72.8%	72.0%	
Black Non-Hispanic	13.4%	13.5%	
Hispanic	7.5%	8.2%	
Asian	3.5%	3.2%	
Other	2.8%	3.1%	
CCI Score	7.27	6.04	<0.0001
0-2	11.4%	20.0%	
3-5	20.5%	28.0%	
6-8	26.5%	23.0%	
≥9	41.6%	29.0%	
Location of Tumor			<0.0001
Head	27.9%	45.3%	
Body	4.6%	6.8%	
Tail	7.4%	8.1%	
Other specified sites	7.7%	9.7%	

Part unspecified	53.7%	31.7%	
Payer			<0.0001
Medicare	64.3%	56.3%	
Medicaid	7.0%	8.7%	
Commercial	21.2%	29.0%	
Other	7.6%	6.1%	
Admission Type			<0.0001
Elective	13.8%	36.4%	
No Elective	86.2%	63.6%	
Teaching Hospital			<0.0001
Rural	6.4%	4.5%	
Urban nonteaching	28.3%	23.5%	
Urban teaching	65.3%	72.0%	
Region			<0.0001
Northeast	22.5%	21.9%	
Midwest	20.0%	19.7%	
South	37.4%	41.4%	
West	20.0%	17.0%	
Surgery			<0.0001
No	98.2%	73.6%	
Yes	1.8%	26.4%	

Table 2. Results of logistic regression model of effect of DNR on mortality, controlling for other covariates

Variable	Odds Ratio	95% Confidence Interval		<i>p</i> value
		Lower	Upper	
DNR	5.90	5.41	6.42	<0.0001
Age				
19-59	Reference			
60-69	1.23	1.09	1.38	0.0010
70-79	1.57	1.37	1.79	<0.0001
≥80	1.45	1.25	1.67	<0.0001
Sex				
Male	Reference			
Female	0.79	0.73	0.85	<0.0001
Race/Ethnicity				
White Non-Hispanic	Reference			
Black Non-Hispanic	1.24	1.10	1.39	<0.0001
Hispanic	1.10	0.95	1.28	0.2000
Asian	1.24	1.00	1.55	0.0510
Other	1.30	1.04	1.62	0.0210
CCI Score				
0-2	Reference			
3-5	1.01	0.88	1.16	0.8660
6-8	1.35	1.18	1.54	<0.0001
≥9	1.46	1.29	1.66	<0.0001
Location of Tumor				
Head	Reference			
Body	1.09	0.89	1.34	0.3890
Tail	1.27	1.07	1.51	0.0060
Other specified sites	1.63	1.40	1.90	<0.0001
Part unspecified	2.54	2.30	2.80	<0.0001
Payer				

Medicare	Reference			
Medicaid	1.45	1.22	1.72	<0.0001
Commercial	1.93	1.73	2.15	<0.0001
Other	2.99	2.58	3.45	<0.0001
Admission Type				
Elective	Reference			
No Elective	0.71	0.64	0.78	<0.0001
Teaching Hospital				
Urban teaching	Reference			
Rural	2.38	2.06	2.74	<0.0001
Urban nonteaching	1.27	1.16	1.39	<0.0001
Region				
Northeast	Reference			
Midwest	0.76	0.67	0.86	<0.0001
South	0.77	0.69	0.86	<0.0001
West	0.71	0.62	0.81	<0.0001
Surgery				
No	Reference			
Yes	0.57	0.48	0.67	<0.0001
Year				
2011	Reference			
2012	0.87	0.76	0.99	0.0360
2013	0.87	0.76	1.00	0.0430
2014	0.80	0.70	0.92	0.0010
2015	0.69	0.60	0.79	<0.0001
2016	0.66	0.58	0.76	<0.0001

Table 3. Results of generalized linear model of effect of DNR on costs, controlling for other covariates

Variable	Marginal Effect	95% Confidence Interval		<i>p</i> value
		Lower	Upper	
No DNR / Survived	Reference			
No DNR / Died	\$5,638	\$4,479	\$6,797	<0.0001
DNR / Survived	-\$456	-\$1,017	\$104	0.1100
DNR / Died	-\$983	-\$1,855	-\$111	0.0270
Age				
19-59	Reference			
60-69	-\$528	-\$1,030	-\$27	0.0390
70-79	-\$1,178	-\$1,766	-\$589	<0.0001
≥80	-\$2,795	-\$3,399	-\$2,191	<0.0001
Sex				
Male	Reference			
Female	-\$622	-\$970	-\$274	<0.0001
Race/Ethnicity				
White Non-Hispanic	Reference			
Black Non-Hispanic	\$1,887	\$1,322	\$2,451	<0.0001
Hispanic	\$954	\$265	\$1,643	0.0070
Asian	\$2,120	\$1,016	\$3,225	<0.0001
Other	\$2,444	\$1,314	\$3,574	<0.0001
CCI Score				
0-2	Reference			
3-5	\$2,428	\$1,873	\$2,983	<0.0001
6-8	\$2,545	\$1,962	\$3,128	<0.0001
≥9	\$4,231	\$3,660	\$4,801	<0.0001
Location of Tumor				
Head	Reference			
Body	-\$2,967	-\$3,589	-\$2,344	<0.0001

Tail	-\$4,099	-\$4,643	-\$3,556	<0.0001
Other specified sites	-\$643	-\$1,246	-\$39	0.0370
Part unspecified	-\$5,527	-\$5,907	-\$5,147	<0.0001
Payer				
Medicare	Reference			
Medicaid	\$93	-\$648	\$834	0.8050
Commercial	-\$1,234	-\$1,717	-\$750	<0.0001
Other	-\$2,942	-\$3,623	-\$2,262	<0.0001
Admission Type				
Elective	Reference			
No Elective	-\$88	-\$542	\$365	0.7030
Teaching Hospital				
Urban teaching	Reference			
Rural	-\$5,468	-\$6,082	-\$4,855	<0.0001
Urban nonteaching	-\$2,719	-\$3,117	-\$2,322	<0.0001
Region				
Northeast	Reference			
Midwest	-\$2,411	-\$2,909	-\$1,912	<0.0001
South	-\$2,231	-\$2,687	-\$1,775	<0.0001
West	\$3,981	\$3,324	\$4,638	<0.0001
Surgery				
No	Reference			
Yes	\$23,874	\$22,926	\$24,822	<0.0001
Year				
2011	Reference			
2012	-\$946	-\$1,521	-\$370	0.0010
2013	-\$1,278	-\$1,848	-\$707	<0.0001
2014	-\$1,565	-\$2,131	-\$1,000	<0.0001
2015	-\$1,890	-\$2,447	-\$1,333	<0.0001

2016

-\$2,648

-\$3,187

-\$2,108

<0.0001

Figures

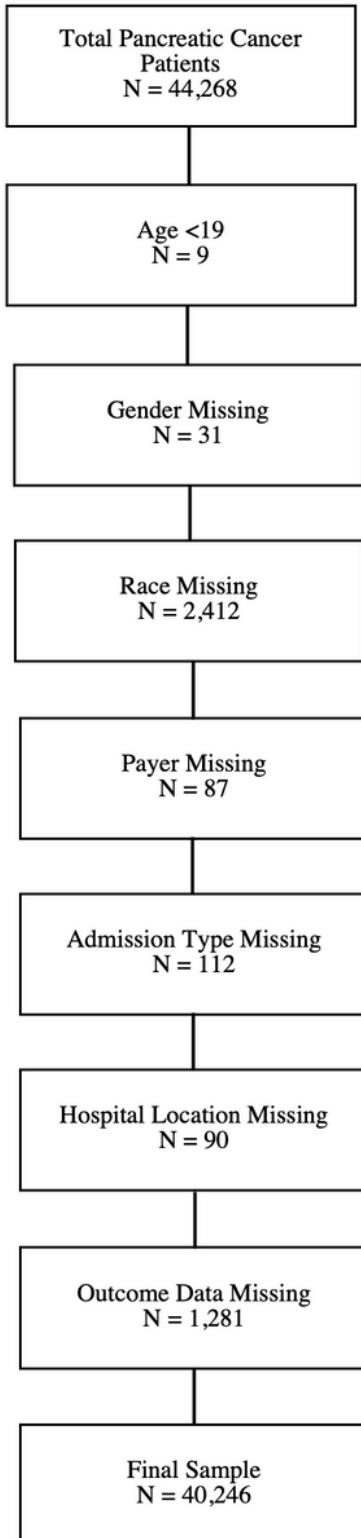


Figure 1

Determination of study cohort

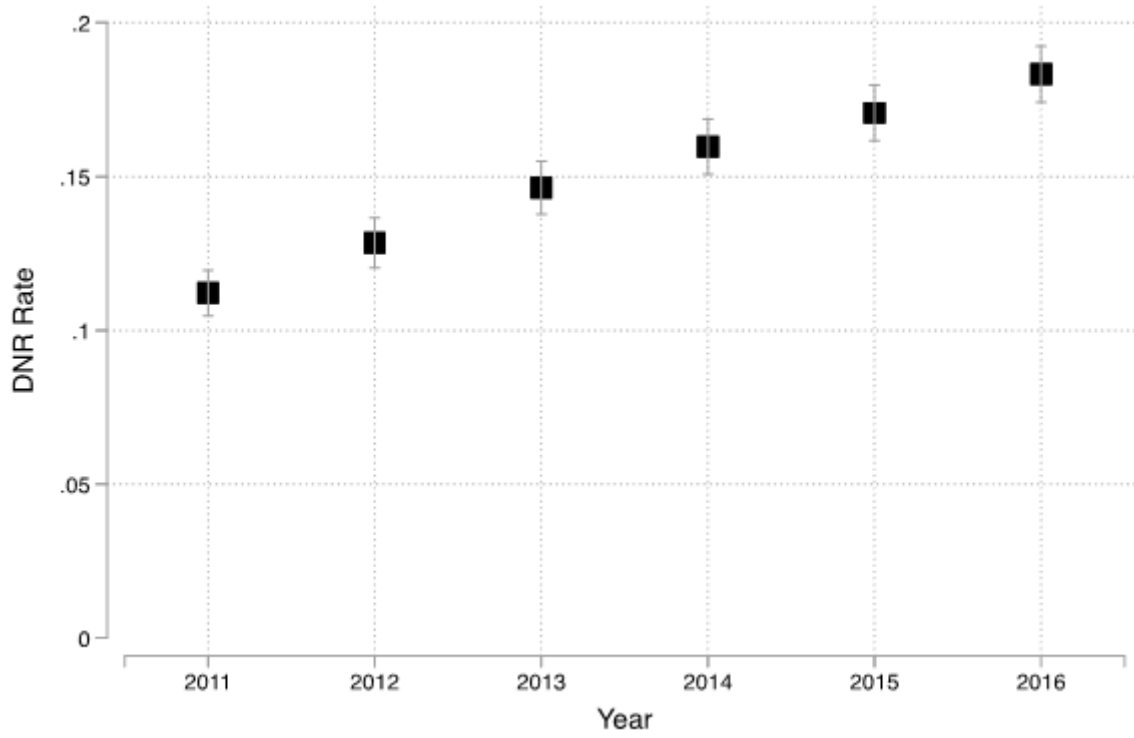


Figure 2

Proportion of patients with pancreatic cancer with a DNR order, stratified by year of admission.