

BACKGROUND

- 42,249 opioid overdose deaths nationwide in 2016, a five-fold increase since 1999
- Physicians who receive industry payments prescribe generic drugs at a lower rate
- Industry payments for a drug to a region are associated with higher market share of that drug in that region
- 1 in 12 of all physicians and 1 in 5 family practice physicians in the US received an opioid-related industry payment between 2013 and 2014
- 93% of opioid-related payments were for food/beverages between 2013 and 2014
- \$46 million spent on opioid related payments to physicians between 2013 and 2014
- Opioid-related payments one year predict higher opioid prescribing the next year

METHODS

- Merged 2015 Medicare Part D and Open Payments Data from PA
- Examined association between number of opioid-related payments received by individual physicians and their opioid prescribing rate (opioid claims/total claims)
- Physician specialties grouped into primary care, other specialty, pain management
- Aggregated prescribing and payment data to Pennsylvania Dartmouth Hospital Atlas of Health Care Hospital Service Areas (HSAs), N=128
- Analyzed relationship between HSA average opioid-related payments and HSA average days of opioid filled per physician

Individual Analysis: Binomial Regression Model

$$\ln\left(\frac{\text{Opioid Claims}}{\text{Total Claims}}\right) = \beta_0 + \beta_1 \text{Pain} + \beta_2 \text{Other Specialty} + \beta_3 \text{Payment Number}$$

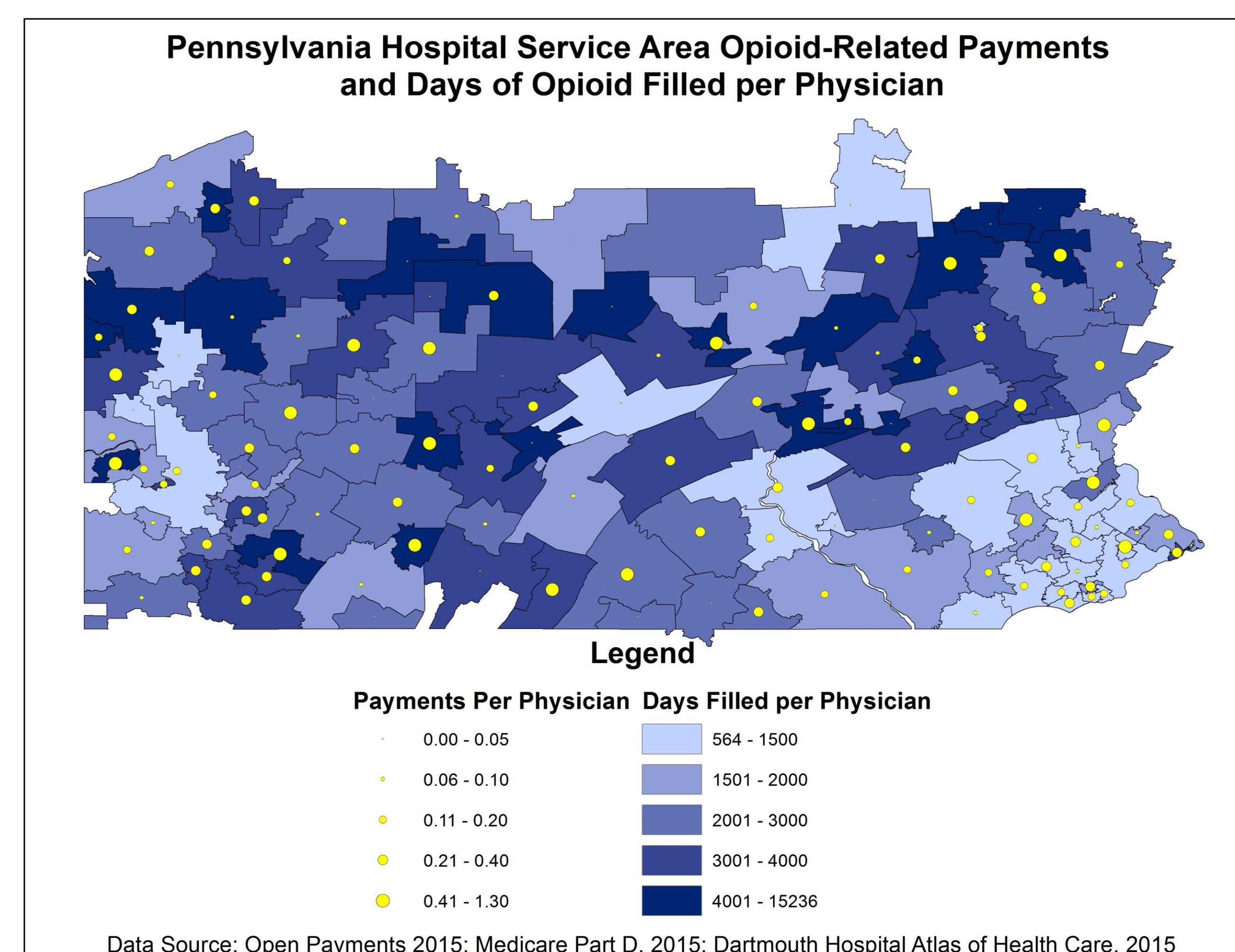
Ecological Analysis: Log-Linear Model

$$\ln(\text{avg HSA Provider Days Filled}) = \beta_0 + \beta_1 (\text{avg HSA Provider Opioid Payments})$$

RESULTS

- 40,390 total physicians in the sample, 1,675 received opioid-related payments
- 28,894 with unsuppressed opioid prescribing rate, 1,616 of those received payments
- Primary care physicians who received opioid-related payments prescribed approximately three times more of all drugs than the state average
- More than 50% of pain management physicians received an opioid-related payment
- One additional payment to a physician was associated with 4.2% higher opioid-prescribing rate, with pain management prescribing at the highest rate and primary care prescribing at the lowest rate
- One additional payment per physician in an HSA was associated with 79% more days of opioid filled on average by each HSA physician

RESULTS



HSA Level Association Between Opioid-Related Payments and Opioid Prescriber Rate

Parameter	e ^β	95% CI e ^β	Chi-Square	DF	p
Payments per HSA Physician	1.79	1.23-2.61	9.17	1	0.0025

Note: e^β = Exponentiated Beta Contrast Estimate, CI = Confidence Interval, DF = Degrees of Freedom

Association Between Opioid-Related Payments and Physician Opioid Prescriber Rate

	DF	Chi-Square	p			
Specialty	2	483191	<.0001			
Payment Number	1	131492	<.0001			
Specialty	e ^β	95% CI e ^β	SE	Wald	p	LS Means
Other Specialty	2.06	2.05 - 2.06	0.0013	310185	<.0001	8.08%
Pain	9.89	9.81-9.97	0.0042	300758	<.0001	29.70%
Primary Care	Ref	Ref	Ref	Ref	Ref	4.10%
	e ^β	95% CI e ^β	SE	Chi-Square	p	
Payment Number	1.0418	1.0416-1.0420	0.0001	122678	<.0001	

Note: DF = Degrees of Freedom, e^β = Exponentiated Beta, CI = Confidence Interval, SE = Standard Error of the Mean, LS Means = Least Square Means for the percent of all Part D claims accounted for by opioids. Chi-Square values differ slightly for the Payment Number variable between the top and bottom rows because the top reflects maximum likelihood estimates, the bottom Bayesian contrast estimates.

DISCUSSION & LIMITATIONS

- ❖ Opioid-related payments are associated with higher opioid prescribing rate at the individual level and the HSA level
- ❖ Certain physician specialties receive more payments at a higher monetary value than other specialties, and physicians who receive opioid-related payments prescribe a higher volume of all drugs
- ❖ Administrators and policy makers should consider revising rules related to pharmaceutical company marketing tactics
- **Limitations**
 - Suppression of low prescribing rates (derived from fewer than 11 beneficiaries) may underestimate the difference between those who did and did not receive industry payments due to greater missingness for unpaid physicians than paid physicians
 - Cross-sectional analysis: no temporality
 - HSAs cross state borders, but we only used PA payment and prescribing data (values from some border HSAs may be less reliable)
 - This data is derived from Medicare Part D claims, so it only reflects prescribing to the population of Pennsylvania Part D beneficiaries
 - Direction of association unknown: paid prescribers prescribe more or high volume prescribers targeted for marketing?

CORE COMPETENCIES

1A4/1B4/1C4 Uses information technology in accessing, collecting, analyzing, using, maintaining, and disseminating data and information, **1B1** Describes factors affecting the health of a community, **1B2** Identifies/Determines quantitative and qualitative data and information needed for assessing the health of a community, **1A5/1B5** Selects valid and reliable data/Analyzes the validity and reliability of data, **1A9** Describes public health applications of quantitative and qualitative data, **1B9** Analyzes quantitative and qualitative data, **1A10/1B10** Uses/Interprets qualitative and quantitative data, **1A14**: Describes how evidence (e.g., data, findings reported in peer-reviewed literature) is used in decision making, **3B2** Communicates in writing and orally with linguistic and cultural proficiency, **3B4** Suggests/Selects approaches for disseminating public health data and information, **3A5/3B5/3C5** Conveys data and information to professionals and the public using a variety of approaches, **6A5**: Recognizes limitations of evidence (e.g., validity, reliability, sample size, bias, generalizability), **6B6**: Determines limitations of evidence (e.g., validity, reliability, sample size, bias, generalizability), **6C6**: Explains limitations of evidence (e.g., validity, reliability, sample size, bias, generalizability), **6A8/6B9/6C9** Contributes to the public health evidence base

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