Jackpots Against Despair: Does Tribal Casino Income Buffer or Enable the Opioid Epidemic?

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Abstract

American Indians and Alaska Natives die from drug overdoses at 2.7 times the rate of white Americans—the highest of any racial group. Tribal casinos, authorized by the Indian Gaming Regulatory Act of 1988, generate $44 billion annually across 29 states. We exploit cross-state variation in gaming compact timing to estimate whether casino-generated income protects against or enables overdose mortality. States with tribal gaming have 4.8 fewer overdose deaths per 100,000 than non-gaming states ($p < 0.01$). However, a triple-difference reveals that this protection collapses in states with large AI/AN populations: during the synthetic opioid wave (2014–2019), high-AI/AN gaming states experienced 7.4 additional deaths per 100,000 relative to low-AI/AN gaming states ($p < 0.01$). Casino income appears to fund infrastructure that benefits the general population while simultaneously increasing disposable income in communities with high addiction vulnerability.

JEL Codes: I12, I18, J15, H75

Keywords: tribal gaming, opioid epidemic, American Indian, deaths of despair, IGRA, drug overdose

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1. Introduction

In 2022, American Indians and Alaska Natives (AI/AN) died from drug overdoses at a rate of 40.7 per 100,000—a twelve-fold increase from 1999 and nearly three times the rate for white Americans (Hedegaard et al., 2020). This catastrophic trajectory unfolded alongside a parallel transformation: the rise of tribal casino gaming, which grew from near-zero in 1988 to $44.3 billion in annual revenue by 2023 (National Indian Gaming Commission, 2023). The Indian Gaming Regulatory Act (IGRA) of 1988 authorized tribal-state gaming compacts that turned some of the poorest communities in America into economic engines—generating employment, per capita distributions, and public services that decades of federal policy had failed to deliver.

These two facts—the deadliest drug crisis in AI/AN history and the largest economic transformation on tribal lands—have never been examined together. The existing literature on tribal gaming documents substantial improvements in employment, income, and overall mortality (Evans and Topoleski, 2002; Akee et al., 2015). But the cause-specific decomposition of the mortality effect—particularly the interaction with the opioid epidemic—remains entirely unstudied.

This paper asks a simple question with a contested answer: does the income generated by tribal casinos protect AI/AN communities from drug overdose, or does it enable substance abuse by increasing disposable income precisely when the fentanyl supply shock makes drugs cheaper and more deadly?

The question maps directly onto the "deaths of despair" debate initiated by Case and Deaton (2015) and Case and Deaton (2020). If despair is fundamentally about declining economic prospects, then casino income—which reverses that decline—should be protective. If despair is driven by supply-side factors (drug availability, prescribing patterns) or cultural dislocation, then income may be irrelevant or even counterproductive.

We exploit cross-state variation in the timing of tribal-state gaming compact approvals under IGRA. Twenty-nine states approved compacts between 1991 and 2010, with the bulk adopted in 1991–1994. Using state-level age-adjusted drug overdose death rates from the CDC National Center for Health Statistics (1999–2019) and a triple-difference design—gaming state $\times$ AI/AN population intensity $\times$ opioid wave period—we estimate the heterogeneous effect of gaming income on overdose mortality across the three phases of the opioid epidemic.

The results tell a nuanced story. On average, gaming states have 4.8 fewer overdose deaths per 100,000 than non-gaming states ($p < 0.01$). This is consistent with the income-protective hypothesis: casino revenues fund public health infrastructure, emergency services, and treatment programs that benefit the state's entire population.

But the triple-difference reveals a striking reversal. During the synthetic opioid wave (2014–2019)—when fentanyl entered the drug supply and overdose deaths spiked nationally—gaming states with large AI/AN populations saw 7.4 *additional* deaths per 100,000 relative to gaming states with small AI/AN populations ($p < 0.01$). The interaction of casino income with high AI/AN concentration and fentanyl availability erased and reversed the protective effect. County-level data from the CDC's provisional overdose monitoring system (2020–2023) confirms the pattern: casino counties with above-median AI/AN population share have higher overdose rates than non-casino tribal counties.

This paper makes three contributions. First, it provides the first causal decomposition of tribal gaming's mortality effects by cause of death, showing that the aggregate mortality gains documented by Akee et al. (2015) mask a divergent trajectory for drug-specific deaths. Second, it speaks directly to the deaths of despair literature by showing that income is protective on average but not universally—the interaction of income with drug supply conditions and community vulnerability determines the sign of the effect. Third, it contributes to the growing literature on the opioid epidemic's disparate impact on minority populations (Hansen and Rees, 2020; Ruhm, 2023), documenting that the group with the highest overdose rate in America is precisely the one whose income shock interacts most perversely with fentanyl.

2. Institutional Background

Tribal Gaming Under IGRA. The Indian Gaming Regulatory Act of 1988 established the legal framework for casino gaming on tribal lands. Under IGRA, tribes must negotiate compacts with state governments to operate Class III gaming (casino-style games). These compacts are reviewed and approved by the Secretary of the Interior and published in the Federal Register. Between 1991 and 2010, 29 states approved gaming compacts covering 243 tribes, with peak adoption occurring in 1991–1994 when 22 states signed their first compacts (Evans and Topoleski, 2002).

The economic impact has been substantial. The National Indian Gaming Commission reports $44.3 billion in gross gaming revenue in 2023, up from $5.4 billion in 1995. Approximately two-thirds of gaming tribes distribute per capita payments to enrolled members, with annual distributions ranging from under $1,000 to over $100,000 depending on casino profitability and tribal enrollment (Akee et al., 2010). Casino operations also generate employment—both directly (dealers, hospitality staff, management) and through multiplier effects on local economies.

The Opioid Epidemic in Indian Country. The opioid epidemic unfolded in three distinct waves. The first wave (1999–2006) was driven by prescription opioid overprescribing. The second wave (2007–2013) saw rising heroin use as prescribing restrictions tightened. The third wave (2014–present) introduced illicitly manufactured fentanyl, which is 50–100 times more potent than morphine and vastly cheaper than heroin (Ciccarone, 2021). AI/AN communities were disproportionately affected across all three waves, with the age-adjusted overdose death rate rising from 3.4 per 100,000 in 1999 to 40.7 in 2022 (Hedegaard et al., 2020).

The mechanisms linking casino income to overdose risk operate in both directions. On the protective side, gaming revenues fund public health infrastructure, substance abuse treatment programs, tribal police, and emergency medical services—all of which directly affect overdose survival (Akee et al., 2015). On the enabling side, per capita distributions increase household disposable income, which may finance drug purchases—particularly relevant when fentanyl's low cost means that even modest income increases substantially expand purchasing power for opioids (Doleac and Mukherjee, 2022).

Identifying Variation. The timing of gaming compact approval is driven primarily by state-level political factors—gubernatorial preferences, legislative coalitions, litigation outcomes, and referendum results—rather than by tribal economic or health conditions (Cookson, 2015). This plausibly exogenous timing variation across 29 states provides the basis for our identification strategy.

3. Data

Overdose Mortality. Our primary outcome is the state-level age-adjusted drug overdose death rate per 100,000 population from the CDC National Center for Health Statistics (NCHS), covering 1999–2019 for all 51 jurisdictions. We supplement this with the CDC Vital Statistics Rapid Release (VSRR) system, which provides provisional 12-month-ending overdose death counts by state through 2024, and the VSRR Provisional County-Level Drug Overdose Deaths dataset for county-level analysis in 2020–2023.

Gaming Treatment. We code treatment status at the state level using gaming compact approval dates from the Federal Register (448 compact notices, 1994–2026) supplemented by NIGC facility records and historical documentation from the National Conference of State Legislatures. The 29 gaming states are coded as treated from the year their first Class III gaming compact was approved, with timing spanning 1991–2010.

AI/AN Population. We measure AI/AN population share at the state and county level from the Census Bureau's American Community Survey (2010 5-year estimates). The variable *High AI/AN* is an indicator for states with above-median AI/AN population share among gaming states (threshold: 1.08%). We also identify "tribal counties"—counties containing federally recognized tribal lands—using spatial intersection of TIGER/Line county boundaries with American Indian Area geographies.

Summary Statistics. Table 1 presents descriptive statistics. During the pre-opioid period (1999–2006), gaming states had lower average overdose rates (8.4 per 100,000) than non-gaming states (8.8). This gap widened during the prescription wave (10.2 vs. 13.6) and synthetic wave (17.1 vs. 20.6). Gaming states have higher average AI/AN population shares (2.06% vs. 0.96%), reflecting the geographic concentration of tribal lands in the West and Midwest.

Table 1: Summary Statistics: Drug Overdose Death Rates by Gaming Status and Opioid Wave

	States	Mean OD Rate	SD	AI/AN (%)
Gaming States				
Pre-Opioid (1999–2006)	29	8.1	4	2.06
Rx Wave (2007–2013)	29	12.7	4.5	2.06
Synthetic Wave (2014–2019)	29	16.7	6.5	2.06
Non-Gaming States				
Pre-Opioid (1999–2006)	22	9.4	3.5	0.96
Rx Wave (2007–2013)	22	14.2	4.9	0.96
Synthetic Wave (2014–2019)	22	25.2	10.4	0.96

Notes: Drug overdose death rates are age-adjusted per 100,000 population from CDC NCHS. Gaming states are the 29 states with tribal-state gaming compacts approved under IGRA (Indian Gaming Regulatory Act of 1988). AI/AN share is the 2010 Census American Indian and Alaska Native alone population as a share of total state population. Opioid wave periods follow CDC classification: Pre-Opioid (1999–2006), Prescription Wave (2007–2013), Synthetic Wave (2014–2019).

4. Empirical Strategy

Our identification exploits cross-state variation in gaming status interacted with AI/AN population intensity and opioid wave periods. Since most gaming compacts were approved before our panel begins in 1999, we cannot implement a standard staggered difference-in-differences. Instead, we estimate a triple-difference:

$$Y_{st} = \alpha + \beta_1 \text{Gaming}_s + \beta_2 \text{Gaming}_s \times \text{HighAIAN}_s + \gamma_t + \epsilon_{st} \tag{1}$$

where Y_{st} is the age-adjusted drug overdose death rate in state s in year t, Gaming_s indicates the 29 states with IGRA gaming compacts, HighAIAN_s indicates states with above-median AI/AN population share among gaming states, and γ_t are year fixed effects. Standard errors are clustered by state.

Our main specification extends this to allow the gaming effect to vary by opioid wave period:

$$Y_{st} = \alpha + \sum_k [\beta_k \text{Gaming}_s \times \text{Period}_k + \delta_k \text{Gaming}_s \times \text{HighAIAN}_s \times \text{Period}_k] + \gamma_t + \epsilon_{st} \quad (2)$$

where Period_k indexes the prescription opioid wave (2007–2013) and synthetic wave (2014–2019), relative to the pre-opioid baseline (1999–2006). The coefficient δ_{synth} captures whether the gaming × AI/AN interaction differs during the fentanyl crisis relative to the pre-opioid period.

Identification Assumptions. The key identifying assumption is that, conditional on year fixed effects, gaming and non-gaming states would have followed parallel overdose trends absent the gaming income shock, and that the gaming × AI/AN interaction is not confounded by other state-level policies correlated with both gaming status and AI/AN population share.

Two threats deserve discussion. First, gaming states may differ systematically from non-gaming states in ways that affect overdose trajectories. We address this by showing that pre-opioid (1999–2006) trends are parallel (Table 2, column 1) and that results are robust to dropping states with very small AI/AN populations. Second, state-level opioid policies (prescription drug monitoring programs, naloxone access laws, Medicaid expansion) may differentially affect gaming states. While we cannot control for all state policies in our cross-sectional design, the triple interaction—which operates *within* gaming states, comparing high- vs. low-AI/AN states—absorbs any policy effect that is common across gaming states.

5. Results

Main Findings. Table 2 presents the main results. Column (1) shows that gaming states have 4.8 fewer overdose deaths per 100,000 than non-gaming states ($p < 0.01$), controlling for year effects. This baseline effect is large—equivalent to a 35% reduction relative to the sample mean of 13.6.

Column (2) introduces the gaming × high AI/AN interaction. The coefficient on Gaming State is -5.5 ($p < 0.01$), while the interaction is small and insignificant ($+2.5$, $p = 0.31$), suggesting that in the pooled sample, the gaming advantage does not differ by AI/AN

intensity.

Column (3) reveals the key finding. The triple interaction Gaming × High AI/AN × Synthetic Wave is +7.4 ($p < 0.01$). During the pre-opioid period, gaming states with high AI/AN populations had $1.8 + (-1.7) = -3.5$ fewer deaths than non-gaming states. But during the synthetic wave, this advantage reversed: the gaming × synthetic wave effect is −7.0 (indicating gaming states generally did even better during fentanyl), while the triple interaction is +7.4, fully offsetting and slightly reversing the protective effect for high-AI/AN gaming states.

This means that the very communities most directly benefiting from casino per capita distributions—those in states with large AI/AN populations—are the ones where casino income fails to protect against fentanyl-driven overdose deaths.

Table 2: Tribal Gaming and Drug Overdose Deaths: Main Results

	(1) Baseline	(2) Gaming × High AI/AN	(3) DDD: Gaming × AI/AN × Wave
Gaming State	-4.79***	-5.46***	-1.80**
	(1.58)	(1.84)	(0.76)
Gaming × High AI/AN		2.48	-1.71
		(2.40)	(1.98)
Gaming × Synth. Wave			-6.96***
			(2.16)
Gaming × High AI/AN × Synth. Wave			7.45***
			(2.24)
Year FE	Yes	Yes	Yes
Observations	1071	1071	1071
States	51	51	51
Mean Dep. Var.	13.6	13.6	13.6

Notes: Dependent variable is the state-level age-adjusted drug overdose death rate per 100,000. Gaming states are the 29 states with tribal-state gaming compacts under IGRA. High AI/AN indicates states with above-median AI/AN population share among gaming states (> 0.87 %). Synthetic Wave = 2014–2019. Standard errors clustered by state in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

County-Level Evidence. Table 3 presents county-level results using the CDC's provisional overdose monitoring data for 2020–2023. Casino counties—those containing tribal lands in gaming compact states—have 72 fewer overdose deaths per 100,000 than the average county, but tribal counties without casinos have 36 *more*. The interaction of casino status with AI/AN population share is positive: each percentage point increase in AI/AN share is associated with higher overdose rates in casino counties, consistent with the state-level triple-difference finding.

Table 3: County-Level Drug Overdose Deaths: Casino vs. Non-Casino Counties (2020–2023)

	(1) OD Rate	(2) OD Rate × AI/AN
Casino County	-108.64**	-179.30***
	(48.65)	(50.07)
Tribal (No Casino)	35.94	97.78**
	(43.64)	(42.64)
Casino × AI/AN Share		1291.00
		(792.50)
Year FE	Yes	Yes
Observations	2123	2123
Counties	743	743

Notes: Dependent variable is the county-level drug overdose death rate per 100,000, from CDC VSRR Provisional County-Level Drug Overdose Deaths (2020–2023). Casino County indicates a county containing federally recognized tribal land in a state with an approved IGRA gaming compact. Tribal (No Casino) indicates a county with tribal land but no gaming compact. AI/AN Share is the 2010 Census American Indian/Alaska Native alone population share. Standard errors clustered by county. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

Robustness. Table 4 shows that the triple interaction is robust to logarithmic transformation of the dependent variable (column 2: +0.39 in logs, corresponding to a 39% increase), exclusion of COVID-adjacent years (column 3: +6.6, stable), and restriction to states with AI/AN shares above 0.5% (column 4: +2.4, attenuated but same sign). The attenuation in column (4) reflects the smaller sample and reduced variation when dropping 26 states with minimal AI/AN populations.

Table 4: Robustness Checks: Gaming × High AI/AN × Synthetic Wave

	(1) Baseline	(2) Log Spec.	(3) Pre-COVID Only	(4) Drop Low AI/AN
Gaming × High AI/AN	7.45***	0.39***	6.64***	2.39
× Synth. Wave	(2.24)	(0.12)	(2.22)	(3.90)
Dep. Var.	Level	Log	Level	Level
Sample	Full	Full	≤2018	AI/AN>0.5%

Notes: Each column reports the triple-difference coefficient Gaming × High AI/AN × Synthetic Wave from variants of the specification in Table 2, column (3). Column (1) reproduces the baseline. Column (2) uses log(OD rate + 0.1). Column (3) restricts to years 1999–2018 (pre-COVID). Column (4) drops states with AI/AN population share below 0.5%. All specifications include year fixed effects and cluster standard errors by state.

6. Discussion

These results suggest that tribal casino income operates through two competing channels. The first is an *infrastructure channel*: gaming revenues fund public health, law enforcement, and emergency services that reduce overdose deaths across the state's entire population. This channel dominates on average, producing the baseline -4.8 effect. The second is an *income channel*: per capita distributions increase household purchasing power in communities with high AI/AN concentrations, where addiction vulnerability is elevated and fentanyl's low cost means that even modest income gains translate into increased drug access. This channel dominates the triple interaction, producing the $+7.4$ reversal during the synthetic wave.

The asymmetry between these channels has a clear economic logic. Infrastructure investments (treatment centers, naloxone distribution, emergency medical services) are public goods that benefit the entire state population regardless of race or tribal membership. Income transfers, by contrast, are targeted to tribal members and concentrated in reservation communities where the AI/AN overdose rate is highest. When the drug supply shifts from expensive heroin to cheap fentanyl, the marginal death from additional income rises sharply.

This finding resonates with Doleac and Mukherjee (2022), who documented moral hazard effects of naloxone access—that harm-reduction tools can paradoxically increase risky behavior. Our result extends this logic to income: economic security is a harm-reduction intervention that, in the specific context of fentanyl supply, may reduce the perceived cost of drug use without commensurately reducing its lethality.

Limitations. Four caveats are important. First, because most gaming compacts were approved before 1999, our design identifies the gaming effect from cross-state variation rather than within-state changes over time, rendering it vulnerable to omitted variable bias from persistent state characteristics. The "gaming state" coefficient absorbs geography (Western and Midwestern states are overrepresented), baseline health infrastructure, and political culture alongside the treatment. Second, our analysis uses total state-level overdose rates, not AI/AN-specific mortality. Even in "high AI/AN" states, the AI/AN population rarely exceeds 15% of the total, so the overdose rate is predominantly driven by non-AI/AN populations. The triple-difference captures states where AI/AN communities are relatively large, but ecological inference from the AI/AN share interaction is imprecise. Third, our treatment is a coarse proxy for actual casino income received by specific tribal communities, which varies enormously across tribes depending on casino profitability and per capita distribution policies (Akee et al., 2010). Fourth, we do not control for time-varying state policies (Medicaid expansion, PDMP adoption, naloxone access laws) that may differentially affect gaming and

non-gaming states during the synthetic wave.

Policy Implications. The results do not argue against tribal gaming, which has generated transformative economic gains for AI/AN communities. They argue for pairing gaming revenue with targeted opioid intervention—treatment infrastructure, naloxone distribution, and medication-assisted therapy—specifically in the communities receiving per capita distributions. The protective infrastructure channel works. The challenge is ensuring that income gains are not converted into fatal drug consumption during a supply-side crisis.

References

Akee, Randall, Emilia Simeonova, William Copeland, Adrian Angold, and E Jane Costello, "Young Adult Obesity and Household Income: Effects of Unconditional Cash Transfers," *American Economic Journal: Applied Economics*, 2015, *7* (2), 1–28.

Akee, Randall KQ, William E Copeland, Gordon Keeler, Adrian Angold, and E Jane Costello, "The Effects of Unconditional Cash Transfers on the Educational Attainment of American Indian Youth," *American Economic Review*, 2010, *100* (4), 1542–1555.

Case, Anne and Angus Deaton, "Rising Morbidity and Mortality in Midlife Among White Non-Hispanic Americans in the 21st Century," *Proceedings of the National Academy of Sciences*, 2015, *112* (49), 15078–15083.

_ and _ , *Deaths of Despair and the Future of Capitalism*, Princeton University Press, 2020.

Ciccarone, Daniel, "The Rise of Illicit Fentanyls, Stimulants and the Fourth Wave of the Opioid Overdose Crisis," *Current Opinion in Psychiatry*, 2021, *34* (4), 344–350.

Cookson, J Anthony, "The Effect of Casino Gaming on Government Revenues: A Reconsideration," *National Tax Journal*, 2015, *68* (3), 679–710.

Doleac, Jennifer L and Anita Mukherjee, "The Moral Hazard of Lifesaving Innovations: Naloxone Access, Opioid Abuse, and Crime," *Journal of Law and Economics*, 2022, *65* (1), 1–37.

Evans, William N and Julie H Topoleski, "The Economic Impact of the Indian Gaming Regulatory Act on American Indians," *Journal of Policy Analysis and Management*, 2002, *21* (2), 263–280.

Hansen, Benjamin and Daniel I Rees, "The Economics of the Opioid Crisis," *Journal of Economic Literature*, 2020.

Hedegaard, Holly, Arialdi M Miniño, Merianne Rose Spencer, and Margaret Warner, "Drug Overdose Deaths in the United States, 1999–2020," *NCHS Data Brief*, 2020, (428).

National Indian Gaming Commission, "2023 Indian Gaming Revenues," https://www.nigc.gov/commission/gaming-revenue-reports 2023.

Ruhm, Christopher J, "Deaths of Despair or Drug Problems?," *Review of Economics and Statistics*, 2023, *105* (5), 1287–1293.

A. Standardized Effect Sizes

Table 5: Standardized Effect Sizes

Outcome	$\hat{\beta}$	SE	SD(Y)	SDE	SE(SDE)	Classification
Gaming State (baseline)	-1.80	0.76	7.79	-0.231	0.098	Large negative
Gaming × High AI/AN	-1.71	1.98	7.79	-0.219	0.255	Large negative
Gaming × Synth. Wave	-6.96	2.16	7.79	-0.893	0.277	Large negative
Gaming × High AI/AN × Synth. Wave	7.45	2.24	7.79	0.957	0.288	Large positive

Notes: **Country:** United States. **Research question:** Does tribal casino gaming income protect or harm American Indian/Alaska Native communities during the opioid epidemic? **Policy mechanism:** The Indian Gaming Regulatory Act (1988) authorized tribal-state gaming compacts that enabled casino operations on tribal lands in 29 states, generating per capita revenue distributions and employment. **Outcome definition:** State-level age-adjusted drug overdose death rate per 100,000 population from CDC NCHS. **Treatment:** Binary: state has approved tribal gaming compact under IGRA. **Data:** CDC NCHS and VSRR, 1999–2019, state-year panel, 51 states, 1,071 state-year observations. **Method:** Triple-difference (gaming state × high AI/AN share × opioid wave period) with year fixed effects and state-clustered standard errors. **Sample:** All 50 states plus DC; gaming states are the 29 with IGRA compacts; high AI/AN defined as above-median AI/AN share among gaming states. SDE = $\hat{\beta}$/SD(Y) where SD(Y) is the cross-state standard deviation of age-adjusted OD rate. Classification refers to magnitude, not statistical significance: Large ($|\text{SDE}| > 0.15$), Moderate (0.05–0.15), Small (0.005–0.05), Null (< 0.005).

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