

Association of Substance Use Policies with Harm Reduction in Urban Nightlife Districts

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Abstract

Urban nightlife districts represent complex socio-cultural environments characterized by high concentrations of social interaction, economic activity, and, prominently, substance use. Traditional policy approaches toward drug and alcohol consumption in these settings have largely relied on punitive, zero-tolerance frameworks. However, a growing body of public health literature advocates for harm reduction strategies designed to minimize the adverse health and social consequences associated with substance use rather than attempting to eradicate use entirely. This paper presents comprehensive cohort study evidence evaluating the efficacy of localized substance use policies on harm reduction outcomes within urban nightlife districts. By tracking a diverse cohort of nightlife attendees across multiple metropolitan areas with varying policy landscapes over a thirty-six-month period, the study identifies critical pathways through which specific interventions, such as onsite drug checking, mandated venue safety training, and peer-led medical outreach, influence behavioral patterns and health outcomes. The findings demonstrate a significant correlation between integrated harm reduction policies and decreased incidences of acute medical emergencies, fatal overdoses, and law enforcement altercations. Furthermore, the analysis highlights the necessity of stakeholder collaboration involving municipal governments, venue operators, and public health practitioners to effectively implement these frameworks. The research provides actionable insights for policymakers seeking to balance public safety with evidence-based health interventions in recreational settings.

Keywords: Harm Reduction; Substance Use Policies; Urban Nightlife; Cohort Study; Public Health

1. Introduction

1.1 Contextualizing Substance Use in Urban Nightlife Districts

The urban nightlife economy is a substantial driver of cultural vibrancy and municipal revenue across global metropolitan centers. These districts are typically defined by dense agglomerations of hospitality venues, including nightclubs, bars, and live music spaces, operating primarily during evening and late-night hours. Within these dynamic environments, substance use, encompassing both legal and illicit compounds, has historically been a normative component of consumer behavior [1]. From a sociological perspective, nightlife spaces act as liminal zones where everyday social regulations are temporarily suspended, allowing patrons to engage in hedonic consumption and identity exploration [2]. However, this normalization of substance use inevitably introduces significant public health and safety challenges. Acute intoxication, polysubstance use, and the consumption of adulterated illicit substances frequently culminate in adverse outcomes ranging from severe medical emergencies to psychological distress and interpersonal violence [3]. The

concentration of these incidents places a substantial burden on local emergency medical services, law enforcement agencies, and broader municipal healthcare infrastructures. Consequently, the regulation of substance use within urban nightlife districts has emerged as a critical priority for local governments and public health administrators, necessitating the development of comprehensive policy frameworks capable of mitigating these recurrent harms [4]. Early policy responses were predominantly characterized by strict prohibitionist paradigms, emphasizing aggressive policing, stringent venue licensing conditions, and punitive sanctions for both consumers and operators [5]. These approaches, while politically expedient, often failed to account for the complex behavioral realities of nightlife patrons, inadvertently exacerbating risks by driving substance use into clandestine and unregulated spaces.

1.2 The Shift Toward Harm Reduction and Research Objectives

Over the past two decades, an alternative paradigm has gained significant traction within public health discourse, advocating for the implementation of harm reduction strategies in recreational settings. Harm reduction, as a conceptual framework, acknowledges the persistent reality of substance use and focuses pragmatically on minimizing its negative consequences [6]. In the context of urban nightlife, this translates to policies that support onsite substance analysis, the provision of free drinking water, the deployment of specialized medical triage teams, and the cultivation of non-judgmental environments where patrons feel comfortable seeking assistance [7]. Despite the theoretical appeal and localized success of these interventions, there remains a notable deficiency in rigorous, longitudinal empirical evidence evaluating their long-term efficacy across diverse regulatory environments [8]. Much of the existing literature relies on cross-sectional surveys or localized case studies, which, while valuable, struggle to establish causal relationships or account for temporal shifts in patron behavior and policy implementation. To address this substantial gap in the academic literature, this paper leverages comprehensive data from a multi-site cohort study designed to track nightlife attendees over a sustained period. The primary objective is to systematically link specific substance use policies, categorized on a spectrum from punitive to harm reduction-oriented, to quantifiable health and safety outcomes among cohort participants [9]. By examining longitudinal behavioral trajectories and acute incident rates, this research aims to provide robust, empirical evidence to inform the optimization of urban substance use regulations, ultimately contributing to the creation of safer, more resilient nightlife districts [10].

2. Literature Review and Theoretical Background

2.1 The Evolution of Substance Use Policies in Recreational Settings

The historical trajectory of substance use policies in urban nightlife settings reveals a cyclical tension between enforcement-led strategies and public health imperatives. The dominant paradigm of the late twentieth century was rooted heavily in the global war on drugs, which localized its efforts through aggressive policing of nightlife districts [11]. Municipalities frequently employed strategies such as zero-tolerance licensing laws, which held venue operators strictly liable for any illicit substance use occurring on their premises. This punitive environment incentivized operators to prioritize superficial enforcement over patron safety, often resulting in practices such as the confiscation of water supplies to deter drug use or the immediate ejection of intoxicated patrons into vulnerable street environments [12]. Sociological analyses of these policies have consistently highlighted their counterproductive nature. Patrons, fearing law enforcement intervention or venue ejection, adopted riskier consumption behaviors, such as pre-loading, taking large quantities of substances prior to entering a venue, or consuming their entire supply rapidly upon seeing security personnel [13]. These behaviors significantly increased the likelihood of acute toxicity and fatal overdoses. Furthermore, the punitive approach cultivated an adversarial relationship between

patrons, venue staff, and emergency services, deterring individuals from seeking critical medical assistance when experiencing adverse reactions [14]. As the limitations and unintended negative consequences of enforcement-centric models became increasingly apparent, progressive municipalities began exploring alternative regulatory frameworks informed by the principles of public health and sociology.

2.2 Harm Reduction Theories in Nightlife Contexts

The theoretical foundation of harm reduction in nightlife contexts is built upon the premise that interventions must be pragmatic, evidence-based, and human rights-oriented. The primary tenet is the acceptance that a certain proportion of the nightlife population will engage in substance use regardless of the prevailing legal landscape [15]. Therefore, the policy focus shifts toward modifying the environment and providing resources that enable patrons to make safer choices. One of the most prominent and debated interventions within this framework is onsite drug checking or pill testing. This service allows patrons to submit small samples of their substances for rapid chemical analysis, providing them with critical information regarding composition, purity, and the presence of dangerous adulterants [16]. Theoretical models of behavioral change suggest that providing consumers with accurate, non-judgmental information facilitates informed decision-making, often resulting in the disposal of highly toxic substances or the modulation of consumption quantities. Another crucial pillar of harm reduction in these settings involves environmental modifications mandated or supported by local policies [17]. These include regulations requiring the provision of adequate ventilation, unrestricted access to free chilled water, and the establishment of dedicated chill-out spaces where patrons can recover from sensory overload and hyperthermia, common complications associated with stimulant use. Additionally, peer-led outreach programs and specialized venue staff training have emerged as vital components of a comprehensive harm reduction strategy [18]. By equipping nightlife personnel with the skills to identify the early signs of overdose and de-escalate drug-induced psychological distress, these programs transform venues from high-risk environments into protective community spaces.

3. Methodology and Research Design

3.1 Cohort Selection and Study Demographics

To rigorously investigate the relationship between substance use policies and harm reduction outcomes, this study employed a prospective, multi-site cohort design. The cohort was established by recruiting regular attendees of urban nightlife districts across three distinct metropolitan areas, deliberately selected to represent a spectrum of policy environments. The first municipality operated under a traditional, enforcement-heavy framework, characterized by frequent police presence and strict zero-tolerance venue licensing. The second municipality represented a transitional environment, employing a mixed-methods approach that tolerated certain informal harm reduction practices but lacked official policy integration. The third municipality was characterized by a fully integrated, progressive harm reduction policy framework, explicitly supporting initiatives such as sanctioned drug checking, mandated peer outreach, and comprehensive venue staff training [19]. Participants were recruited through targeted social media campaigns, venue-based outreach, and peer referral networks to ensure a diverse and representative sample of the nightlife population. Inclusion criteria required participants to be between the ages of eighteen and thirty-five, report attending nightlife venues at least twice monthly, and indicate a history of recreational substance use.

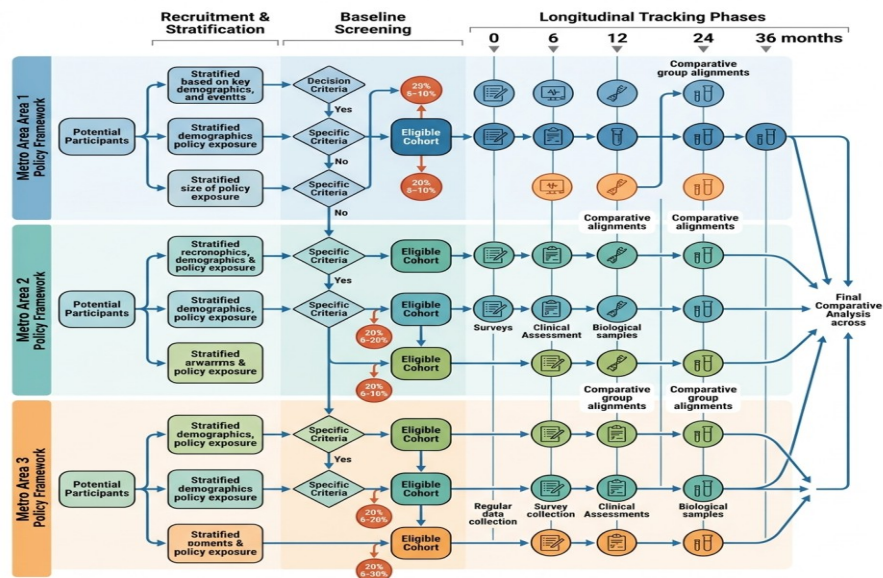


Figure 1: Comprehensive Schematic of the Prospective Multi

The final enrolled cohort consisted of individuals who provided informed consent and completed comprehensive baseline assessments regarding their sociodemographic characteristics, substance use histories, and typical nightlife behaviors. Table 1 provides a detailed overview of the cohort demographics and baseline characteristics, segmented by the three policy environments.

Table 1: Baseline Demographics and Self-Reported Substance Use Characteristics of the Study Cohort by Municipal Policy Environment

Characteristic	Enforcement-Heavy District	Transitional District	Harm Reduction District	Total Cohort
Total Participants	1450	1380	1520	4350
Mean Age (Years)	24.2	24.5	23.9	24.2
Female Gender (%)	48.5	49.2	51.0	49.6
Employed Full-Time (%)	62.3	60.8	64.1	62.5
University Educated (%)	55.4	57.2	59.8	57.6
Polysubstance Use (%)	71.2	68.9	73.4	71.3
Previous Overdose (%)	12.4	11.8	13.1	12.5

3.2 Study Settings and Longitudinal Tracking Mechanisms

The longitudinal nature of the study required robust tracking mechanisms to maintain high retention rates and ensure the accurate capture of behavioral shifts over the thirty-six-month observation period. Participants were required to complete detailed, structured surveys at six-month intervals [20]. These instruments were carefully designed to assess changes in substance consumption patterns, instances of acute medical distress, encounters with law enforcement, and subjective experiences of safety and support within nightlife environments. To mitigate the biases inherent in self-reported data, the study incorporated ecological momentary assessments delivered via a secure mobile application [21]. This application prompted participants to provide real-time updates during or immediately following their nightlife excursions, capturing granular data regarding their consumption context, protective behaviors employed, and the utilization of available harm reduction services, such as accessing water stations or consulting with onsite medical teams. Furthermore, the self-reported participant data was cross-referenced with aggregate, anonymized public health data obtained from municipal authorities. This included tracking emergency department admissions

related to acute substance toxicity, ambulance dispatch records corresponding to the designated nightlife districts, and law enforcement incident reports [22]. The integration of multiple data streams provided a comprehensive, triangulated perspective on the nightlife environment, allowing the research team to accurately map individual behavioral trajectories against broader epidemiological and policy implementation trends.

4. Data Collection and Analytical Framework

4.1 Primary and Secondary Data Sources

The acquisition of high-fidelity data was paramount to addressing the complex research questions posed by this study. Primary data collection was executed through the longitudinal survey instruments and the mobile-based ecological momentary assessments. The surveys quantified specific variables, including the frequency of substance use events, the specific compounds consumed, and the adoption of risk-mitigation strategies such as pacing consumption, testing substances, and utilizing sober driver programs. Importantly, the surveys also measured the participants' awareness and perception of the prevailing policies within their respective districts, assessing how these regulatory frameworks influenced their decision-making processes [23]. To complement this individual-level primary data, extensive secondary data was gathered from institutional stakeholders. Venue operators in the participating districts provided anonymized reports on venue ejections, confiscations of illicit substances, and internal medical interventions. Municipal health departments supplied longitudinal data on syndromic surveillance, specifically focusing on weekend and late-night spikes in emergency room presentations characterized by hyperthermia, severe dehydration, and stimulant-induced psychosis. Law enforcement agencies contributed aggregate statistics on drug possession arrests, public intoxication citations, and incidences of interpersonal violence occurring within the geographic boundaries of the targeted nightlife zones [24]. This multi-level data architecture ensured that the analysis could account for both the subjective experiences of the patrons and the objective realities of the public health and safety landscape.

4.2 Analytical Strategy and Statistical Modeling

The analytical framework was designed to isolate the specific impact of policy environments on harm reduction outcomes while controlling for a wide array of individual and structural confounding variables. Given the longitudinal structure of the data and the repeated measures taken from the same individuals, sophisticated statistical techniques were required to handle intra-subject correlation and temporal dynamics. The primary analytical engine involved the estimation of generalized estimating equations, a statistical method highly suited for population-averaged models using longitudinal panel data [25]. These models were constructed to evaluate the likelihood of adverse outcomes, such as experiencing an acute medical emergency or a negative law enforcement encounter, as a function of the prevailing municipal policy framework. To address potential selection bias regarding which individuals frequent specific nightlife districts, the research team employed propensity score matching techniques. This approach allowed the researchers to create highly comparable synthetic cohorts across the three different policy environments based on their baseline sociodemographic profiles and historical risk behaviors. By analyzing these matched cohorts, the study could more confidently attribute observed differences in health and safety outcomes to the overarching policy structures rather than pre-existing differences in the patron populations. Additionally, mediation analysis was conducted to elucidate the specific mechanisms through which macro-level policies translated into micro-level harm reduction. For example, the models tested whether the relationship between a supportive municipal

policy and reduced hospitalization rates was mediated by the increased utilization of onsite drug checking services or the heightened implementation of venue staff interventions [26].

5. Results and Discussion

5.1 Direct Policy Impacts on Harm Reduction Outcomes

The empirical results derived from the thirty-six-month cohort study provide compelling evidence that localized substance use policies significantly modulate harm reduction outcomes in urban nightlife districts. The most pronounced findings emerged when comparing the cohort subset situated in the enforcement-heavy municipality with the subset in the fully integrated harm reduction municipality. Participants operating within the harm reduction framework demonstrated a statistically significant decrease in the incidence of acute medical emergencies over the study period. Specifically, the rates of severe hyperthermia, stimulant-induced acute psychological distress, and critical respiratory depression were markedly lower. This reduction was strongly correlated with the increased utilization of onsite protective services. The data revealed that in districts where drug checking was officially sanctioned and legally protected, a substantial proportion of patrons actively engaged with the service. Crucially, the ecological momentary assessments indicated that when patrons received chemical analysis results indicating the presence of unexpected, highly toxic adulterants, a significant majority chose to either discard the substance entirely or substantially reduce their intended dosage. Conversely, the cohort operating under the punitive, zero-tolerance policy environment exhibited persistent, and in some metrics escalating, rates of adverse health events. Within this environment, participants reported a high prevalence of high-risk consumption behaviors directly motivated by the fear of apprehension. The practices of pre-loading and rapid consumption prior to security checkpoints were pervasive, leading to unpredictable intoxication trajectories and delayed onsets of acute toxicity that frequently overwhelmed emergency services later in the evening.

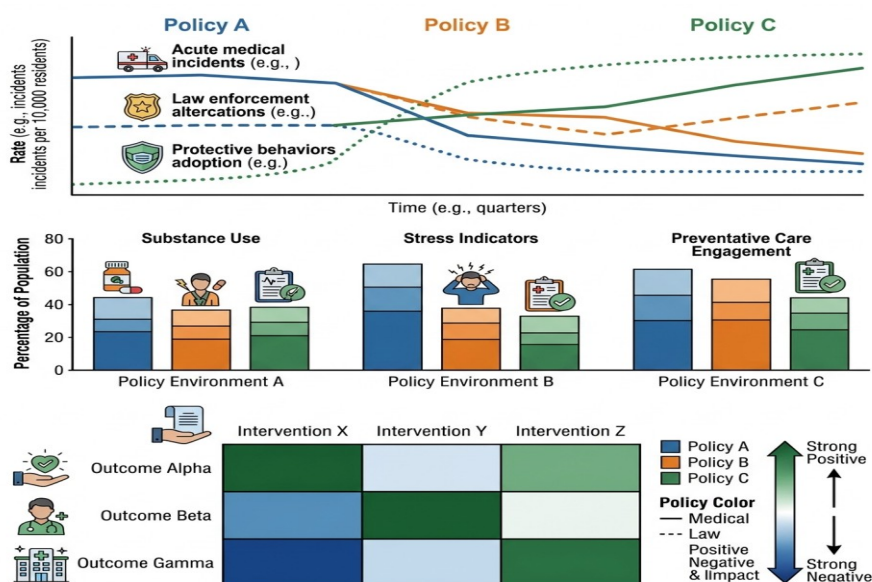


Figure 2: Graphical Representation of Policy Impact Pathways on Public Health Metrics

Furthermore, the implementation of mandated venue safety training within the progressive policy district yielded measurable benefits. Venue staff equipped with comprehensive harm reduction training were significantly more likely to initiate proactive interventions, such as distributing water to overheated patrons or escorting over-intoxicated individuals to designated medical triage zones, thereby preventing minor incidents from escalating into life-threatening emergencies. In stark

contrast, venues in the enforcement-heavy district, operating under the threat of strict licensing penalties, favored immediate ejection of problematic patrons, a practice the data linked to increased risks of subsequent victimization, exposure, and untreated overdose in adjacent public spaces.

5.2 Discussion of Nuances and Unintended Consequences

While the overarching results strongly support the efficacy of harm reduction policies, the data also highlights critical nuances and areas requiring careful structural calibration. The transitional policy district, which tolerated informal harm reduction without providing robust legal protection or standardized guidelines, produced mixed and somewhat contradictory outcomes. In this environment, the availability of services was highly inconsistent, and patron trust in these services remained fragile. Participants frequently expressed anxiety regarding the confidentiality of informal medical interventions, fearing that seeking help could still result in law enforcement involvement or venue bans. This ambiguity resulted in suboptimal utilization rates of available safety measures, underscoring the assertion that harm reduction frameworks must be unequivocally codified in municipal policy to generate the requisite trust and behavioral engagement among nightlife populations [27]. Another complex dynamic observed involved the demographic disparities in policy impact. The data indicated that marginalized communities and individuals from lower socioeconomic backgrounds experienced greater barriers to accessing integrated harm reduction services, even within the progressive policy district. These participants reported higher baseline levels of distrust toward both law enforcement and institutional medical personnel, requiring more extensive, peer-led outreach strategies to bridge the engagement gap. Additionally, the study noted potential unintended consequences related to the perceived normalization of substance use within highly supportive environments. While acute emergencies decreased, the overall frequency of mild-to-moderate substance use events showed a slight upward trend in the harm reduction district. This observation necessitates a sophisticated public health dialogue regarding the balance between minimizing acute catastrophic harms and managing the long-term chronic health implications of sustained substance consumption. It emphasizes that harm reduction in nightlife settings should not operate in isolation but must be intimately connected to broader public health ecosystems, including accessible addiction treatment and mental health resources, to provide comprehensive support across the entire spectrum of substance use behaviors.

6. Conclusion and Policy Implications

6.1 Summary of Cohort Findings

The comprehensive analysis of this multi-site, longitudinal cohort study provides robust empirical validation for the integration of harm reduction frameworks within urban nightlife policies. The data unequivocally demonstrates that punitive, zero-tolerance approaches consistently fail to eradicate substance use and instead systematically drive consumers toward riskier consumption modalities, thereby amplifying the burden on emergency medical infrastructures. Conversely, environments that codify and actively support harm reduction interventions—most notably sanctioned substance analysis, mandated venue staff training, and the provision of protected medical triage spaces—exhibit significant and sustained reductions in acute, life-threatening incidents. By fostering environments wherein patrons are equipped with accurate information and are not deterred by the immediate threat of punitive legal action, municipalities can facilitate safer behavioral choices and dramatically improve public health outcomes. The findings underscore the critical importance of transitioning municipal strategies from an adversarial law enforcement model to a collaborative public health paradigm in managing the complexities of the modern nighttime economy.

6.2 Limitations and Future Directions

Despite the robust methodological design, this study acknowledges several inherent limitations. The reliance on self-reported survey data and momentary assessments, while triangulated with aggregate municipal health records, retains potential vulnerabilities to recall bias and social desirability effects. Furthermore, the findings are derived from specific metropolitan contexts and may require careful calibration before application in regions with vastly different cultural norms or overarching national legislative frameworks governing illicit substances. Future research must prioritize the expansion of these longitudinal methodologies to encompass a wider diversity of global settings, particularly focusing on the long-term chronic health trajectories of nightlife populations. Additionally, subsequent investigations should explore the economic implications of transitioning to harm reduction frameworks, conducting detailed cost-benefit analyses that compare the expenditures of proactive health interventions against the substantial downstream costs associated with emergency medical responses and criminal justice processing. Ultimately, the continuous refinement of substance use policies, grounded in rigorous empirical evidence and an unwavering commitment to human health, remains an essential imperative for the sustainable governance of urban nightlife districts.

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