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Drug Abuse and Substance Use in Newark, USA: A Neighbourhood-Level Public Health Analysis

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Research Article

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Abstract

Substance use disorders continue to be a significant urban public health issue in the United States and are a major contributor to preventable morbidity and mortality and growing health inequities. The opioid epidemic has also had a disproportionate effect on large metropolitan areas, particularly with the emergence of illicit synthetic opioids such as fentanyl. This study investigates the trends of drug abuse and substance use in Newark, New Jersey, within a neighborhood-level public health context. A descriptive analysis was performed on publicly available secondary data from state and national surveillance systems, treatment admission reports, overdose mortality statistics, and peer-reviewed literature. The use of substances was analyzed by wards in the city, taking into consideration social determinants of health and service distribution. Opioids, particularly heroin and fentanyl, contributed the most to substance-related morbidity and mortality, followed by alcohol and cocaine. There was a distinct geographic inequality in treatment admissions and overdose, with the Central and South wards having a higher burden than other parts of the city. Neighborhoods with higher levels of poverty, housing instability, and service concentration were most affected.

Background

Substance abuse disorders are one of the most prominent causes of preventable disease around the world and are particularly difficult to address in urban areas. The evolution of the opioid epidemic in the U.S. has gone through numerous phases from the misuse of prescription opioids to the increasing prevalence of heroin, to more recently the widespread use of illicitly produced synthetic opioids like fentanyl being the most prevalent. These shifting patterns have resulted in record levels of overdose deaths, particularly in large urban areas with socioeconomic disparities and systemic disadvantages.[9][8][13][14]

Urban public health research shows that use of drugs/alcohol is connected to the environment, individuals economic status and social circumstances they find themselves in. The factors that contribute to any individual’s risk of drug/alcohol abuse include poverty, lack of employment, homeless/unstable housing, exposure to violence and lack of access to health care. All these factors interact to create barriers that prevent someone from using drugs/alcohol and also to create barriers that prevent someone from recovering from their substance use.[5][6][7]

These determinants are not spread evenly across cities resulting in geographic areas at risk for poor health similar to the same patterns of social inequality.[11][4] Newark, NJ, is representative of these overall trends. Newark, NJ is the largest city in New Jersey and a major transportation, health care and social service center. There are many differences in Newark's neighbourhoods with respect to income level, housing situation and service access. Although considerable capital has been expended on healthcare infrastructure and community development to continue to reduce the city's rate of substance abuse treatment admissions and overdose deaths compared to surrounding communities.[12] the city's drug and drug treatment issues are not uniform but develop in certain neighbourhoods (i.e., wards).

These neighbourhood-level analyses are essential for identifying and understanding substance use patterns. Compared to conducting only individual-level analyses, neighbourhood-level analyses help understand how structural characteristics affect people's access to drugs, healthcare and recovery.[5][6][7] Analyzing Newark from this neighbourhood-based perspective will help identify spatial inequities that lead to public health interventions that can be focused and equitable.

Statement of the Problem

Substance abuse and drug use are a large, ongoing public health issue in Newark, and have an important impact on the health of a population, the health care system, and the overall health of a community. Nationally, there have been consistently very high levels of drug overdose death and overdose death related to opioids, and more recently, synthetic opioids.[10][13] Newark continues to have disproportionately high rates of substance abuse disorder (SUD) treatment admissions, opioid-related overdose deaths, and polysubstance disorders, in comparison to many municipalities across the state of New Jersey, despite significant local, state, and national efforts to address the problem of substance-related harms.[12] Newark's drug use issues are compounded by the high level of social disadvantage and inequitable structural conditions that affect people's exposure to drugs, access to care, and success in recovery from drug use.[4][11]

When it comes to substance-related harm, the problems in Newark are not equally distributed throughout the city’s neighbourhoods. The rise in the use of heroin and fentanyl manufactured illegally, along with the drop in the use of prescription opioids, will lead to an increase in overdose deaths in many of Newark’s vulnerable urban communities. The differences that exist in Newark’s neighbourhoods with regard to substance-related harm are similar to the differences between them with regard to socioeconomic status, housing instability, unemployment, and access to integrated health or social services. Yet, the majority of studies and data used to measure substance-related harm are aggregated to the city or county level, which hides the neighbourhood specific patterns, and makes it very difficult for policymakers and public health practitioners develop targeted, place based interventions.

Historically, the public health response to substance use in Newark has primarily focused on treating individuals and has often not taken into consideration how the neighbourhood context and larger social determinants of health influence a person’s substance use. While there are evidence-based interventions to treat the substance use disorder like MAT and the use of buprenorphine in primary care, there are still great disparities in access to them across socioeconomically disadvantaged communities. The continuation of high overdose deaths supports the need for a more nuanced, neighbourhood informed public health response.

Mental health is a significant factor in the prevalence of substance use-related morbidity and mortality, with people who have mental health problems being at increased risk for suicide and co-occurring psychiatric disorders. In addition to the increased likelihood of psychiatric problems, the community-level burden of mental illness and substance use can be exacerbated by the relationship between these

two conditions.[1][2] Therefore, the focus area of this research is on determining the extent to which comprehensive, neighbourhood-based public health analyses exist for drug abuse and substance use in Newark that will incorporate analyses of both the epidemiological patterns of substance use and the social and structural determinants of health. Absent these types of analyses, public health planners run the risk of not adequately responding to the local community's needs and thus perpetuating disparities in health; therefore, the objective of this research study will be to fill this gap by conducting neighbourhood-level public health analyses on the patterns of substance use across Newark. The results of these neighbourhood-level analyses will provide information to inform the development of equitable, targeted, and context-sensitive public health strategies.

Methods

Study Design

This research study has a descriptive design that relies mainly on secondary data from publicly available sources to carry out the analysis of substance use patterns in Newark. The purpose of the study was to provide a detailed overview of substance use patterns and to examine the variation in these patterns across neighbourhoods. This study does not attempt to establish any causal relationships, but provides a synthesis of existing epidemiological information to describe and contextualise the neighbourhood-level public health framework.

We believe the use of a descriptive design is particularly appropriate in urban public health research, where complex social and structural factors work together to impact health outcomes.[1] [2] By combining data from several different surveillance and reporting systems, a descriptive study approach can support the identification of patterns of spatial inequities, dominant substance use patterns or trends, and populations that are most impacted by substance-related harms.

By using secondary data, this study is able to access large population-level datasets, while avoiding many of the ethical and logistical difficulties associated with collecting primary data. Most importantly, a descriptive research design produces the evidence needed to support public health planning and decision-making regarding place-based interventions, resource allocation and policy development.

The analysis utilizes a public health framework based on the socio-ecological model of drug abuse and substance use through an analysis of the multiple dynamic, interacting influences that operate at multiple societal levels. It does not limit the examination of substance usage to individual behaviour and choices but also recognises that there are greater social, environmental, and structural contexts (e.g., low income, lack of health care access) influencing initiation, continuation, and recovery from substance abuse.[5] [13] This approach is appropriate for examining substance use in urban areas (e.g., Newark) because of the significant neighbourhood disparities (inequalities) and commitments to structural disadvantage that exist and contribute to health and well-being.

On an individual basis, substance use is influenced by biological vulnerability, mental health problems or concerns, trauma, and the behaviours of individuals. Coexisting (or co-occurring) mental health problems (conditions) and experiencing adversity during early life contribute to an individual's developing a substance use disorder.[12]

At the interpersonal level, instability in the family unit, exposure to substance use within the family and household, and exposure or supportive peer group norms increase risk for developing a substance use disorder whereas supportive relationships can facilitate recovery from substance abuse. These interpersonal dynamics are frequently shaped or influenced by the greater structural social/environmental context (e.g., neighbourhood violence, economic hardship) in which they exist.[10]

The characteristics of a neighbourhood affect risk of substance addiction and recovery at the level of the community. For instance, concentrated levels of poverty in the neighbourhood, housing instability, ability to access the drug market, and ability to access treatment greatly influence risk or resilience to addiction.[1] [2]

At the level of structure, societal and historical disinvestment through housing and employment inequalities and drug policy framework create influence over how communities are exposed/ access supportive care.[9] [5]

Evidence-based treatment modalities of supporting the ongoing recovery to substance addiction as well as evidence-based treatment modalities for the ongoing recovery to substance use in a primary care setting through medication assisted treatment and buprenorphine have been shown to decrease mortality from substance addiction in an equitable manner through availability of structural supports.[8] [16]

Results

Citywide Substance Use Patterns

Throughout Newark, opioids predominated as the leading classes of substances responsible for those admitted to treatment and those who died from overdose. The vast majority of the harm from opioids was caused by heroin and fentanyl, which parallels the national picture of how synthetic opioids have become embedded in urban drug distribution systems.[6] [9] [14] In addition, national surveillance data supports the ongoing trend of increased contributions of synthetic opioid use to overdose deaths.[1] [7]

Alcohol use due to misuse remains a large and persistent contributor to treatment admissions and frequently co-occurs with illicit drug use. Evidence shows the harms of misusing alcohol often have a correlation with the broader social and economic factors impacting substance use.[10] [15]

Cocaine continues to be associated with morbidities, especially when combined with opioids or alcohol. While cannabis has a lower risk of immediate fatal overdose compared to opioids or alcohol, it is part of broader patterns of poly-substance use within urban communities.[10] [13]

There is a high prevalence of polysubstance use throughout the entire city; specifically, the combination of opioid and alcohol use has a worrying prevalence, and poses a very high risk of respiratory depression and fatal overdose.[12] [14] and provides a challenge to service delivery and clinical management of these individuals, thus highlighting the need for coordinated and integrated multi-substance public health strategies including increased access to medication assisted treatment and coordinated primary care based interventions.[8] [16]

Neighbourhood-Level Substance Use Patterns

Clear spatial variation was observed across Newark's neighbourhoods.

Table 1
Substance Use Burden by Newark Neighbourhood

Neighbourhood (Ward)	Dominant Substances	Public Health Characteristics
Central Ward	Heroin, fentanyl, alcohol	Highest treatment admissions; high poverty; service concentration
South Ward	Heroin, cocaine, alcohol	Elevated overdose risk; housing instability
West Ward	Alcohol, opioids	Moderate treatment utilisation
North Ward	Alcohol, cannabis	Lower overdose rates; greater residential stability
East Ward (Ironbound)	Alcohol, cocaine	Lower opioid burden; strong social networks

| **East Ward (Ironbound)** | Alcohol, cocaine | Lower opioid burden; strong social networks |

The Central Ward consistently exhibited the highest concentration of treatment admissions and overdose events. This pattern likely reflects the cumulative effects of socioeconomic disadvantage, housing instability, and concentrated structural inequities that shape health risk.[5] [10] In addition, neighbourhood-level clustering of emergency departments, harm reduction programmes, and social services may increase both the visibility of substance use and the likelihood that overdoses are documented in this ward.[13]

The South Ward also demonstrated elevated substance-related harm, particularly involving opioids and stimulants. The continued dominance of heroin and synthetic opioids in urban overdose patterns, combined with social and economic stressors, may amplify vulnerability in this area.[6] [9] Housing instability, unemployment, and limited continuity of outpatient treatment services are structural risk factors associated with heightened overdose risk.[10] [13]

In comparison, North and East Wards are likely to experience lower levels of opioid-related deaths than the other Wards. There is general evidence that higher levels of residential stability, social cohesion, and lower degrees of concentrated disadvantage are associated with lower overall rates of drug-related problems.[11] [13] As a result, neighbourhood-based socioeconomic variables and informal social support systems may act as protective factors against overdose risk and enhance treatment access.

Source of Data: Newark municipal ward classifications and publicly available government planning documents.[12] Map made by the author for descriptive purposes.

This diagrammatic map shows key neighbourhoods (wards) in Newark that were included in the analysis. It is provided as a support tool for interpretation of neighbourhood-level finding results. This figure illustrates the relative spatial location of Central, South, West, North, and East (Ironbound) Wards. The figure is provided for descriptive and illustrative purposes only and should not be interpreted to show exact geographic boundaries or scale.

Overdose Mortality

While there has been a modest decline in overdose mortality statewide over the last several years, urban centres such as Newark continue to have a significantly higher rate of drug overdose deaths.[14] [9] In Newark, the area with the highest rate of drug overdoses is the Central and South Wards, which reflects larger patterns of social and economic inequality, structural disadvantage and the spatial concentration of risk.[5] [10] [13] The results of this study highlight the need for neighbourhood-specific public health interventions that both prevent immediate overdose and address the social determinants of health.

Data source: New Jersey Department of Health overdose surveillance reports and publicly available state mortality data.[1] [12] Values represent relative comparisons across wards rather than absolute mortality counts.

Relative to each other, Central and South Wards have much higher rates of opioid overdose compared to West, North, and East Wards. This disparity highlights both large differences in terms of neighbourhood-level overdose burden throughout Newark and that the majority of people who are suffering from opioid-related harm reside in areas that are characterized by socioeconomic disadvantage and housing instability.[5] [10] The intent of this illustration is to depict only relative differences between Wards and not total counts of mortality.

Discussion

The analysis presented in this study focuses on the analysis of drug and substance use/abuse in Newark neighborhoods as not only a significant public concern but is also representative of the larger issues at hand in their area. Drug abuse and substance use in Newark are not a random occurrence; they are a reflection of the social, economic and structural elements of our city.[10] [13] The data collected demonstrates that drug or substance abuse harms; specifically morbidity and mortality as a result of the

opioid epidemic, occurs predominantly within the same neighborhoods due to the established social inequalities that exist historically and as such, are not simply isolated to the individual behaviors of an individual.[9] [12] The results from this analysis demonstrate that public health initiatives concerning drug use should have a place-based public health approach when determining how to reduce substance use in large cities.[9] [13] [14]

The study observed a significantly larger drug burden to be present in Central and South Wards, and is a result of cumulative experiences of poverty, unstable housing and high levels of service concentration.[5] [10] The neighborhoods that are most economically marginalized are the same neighborhoods that have higher levels of drug market activity, a more extensive and aggressive level of policing, and act as hubs for emergency and social services.[9] [10] This convergence may create a greater awareness of substance use, as well as an increased probability of receiving treatment; however, all of these factors do not guarantee that the treatment will result in long-term recovery.[12] [15]

The trend of increasing opioid-related injury or death, especially deaths involving fentanyl, supports national data showing synthetic opioids have significantly changed overdose risk profiles within urban environments.[6] [9] [14] [16] The unique characteristics of fentanyl, including its great potency, spontaneous nature of creating variability within its existence, and its wider availability in non-opioid based drug supplies all increase the risk of overdose, especially in neighbourhoods that provide limited access to harm reduction services.[8] [16] The rise in Newark's overdose death rates of the most vulnerable population is indicative that the existing intervention strategies are either not implemented in sufficient depth to achieve maximal effectability or lack the necessary adaptations to be more relevant to the specific neighbourhood-level situation in which they are implemented.[9] [13]

Current mortality data shows that although opioids account for the majority of overdose deaths, alcohol exploitation is a very important and often not well recognized contributor to the morbidity that is associated with substance use disorders.[10] [15] As alcohol is commonly used at the same time as both opioids and/or stimulant drugs creates potential risk for overdose, as well as complicates paths for effective substance dependence treatment.[12] These findings raise the question of whether we need additional public health initiatives that look at polysubstance usage rather than just concentrating on opioids alone.[8] [16]

The North and East Wards communities had lower rates of opioid addiction and fatal overdoses than other neighbourhoods. This suggests that there are protective factors in the North and East Wards communities that reduce the likelihood of death or morbidity associated with substance use. There is a connection between residential stability and strong social cohesion (e.g., teamwork) that are believed to contribute to higher rates of the mortality and morbidity in communities that are disadvantaged.[11] [13] These findings support the theory of collective efficacy and social cohesion, which assert the notion that communities with social bonds and shared norms are positioned to mitigate health risk.[11]

The findings of this study offer strong evidence to support the use of the socio-ecological framework. Substance use in Newark is a public health issue with structural roots that exist at multiple levels—

individual, interpersonal, community, and structural.[5] [10] Interventions that do not address all of these levels—particularly, structural determinants such as housing, employment and access to health care—are unlikely to result in sustainable decreases in substance-related harm.[9] [12]

Recommendations

There are a number of evidence-informed recommendations that can be introduced into policy and practice based on the results of the current study and in the context of advanced national and international data.

1. **Design and Implement Neighbourhood-Specific Intervention Strategies for Community Health**
   Rather than using a generic city-wide strategy for all, community health planners need to identify neighborhood-appropriate designs for their interventions. Research supports that when assessing social and structural determinants of substance abuse, concentrated disadvantage yields an increase in one's risk of exposure to substance abuse and a decrease in access to treatment.[10] [13] [5] For example, high burden wards such as Central Ward and South Ward require that significant investments be made in prevention, harm reduction, and treatment services tailored to the specific needs of the neighborhood. Spatially-targeted strategies provide an opportunity to allocate resources to where they will make the greatest difference by increasing efficiency and equity.[9]
2. **Improve Access to Low-Barrier and Integrated Treatment Opportunities**
   Increasing access to low-barrier substance use treatment, particularly medications for treating opioid use disorder (i.e., medication-assisted treatment [MAT]), is imperative. Research has demonstrated that providing buprenorphine or other medication-assisted treatment options reduces overdose deaths when access is not restricted.[8] [16] Increasing ease of access through minimising administrative requirements, providing same-day access to treatment, as well as integrating services into community settings will foster treatment engagement among populations that are consistently unstable. As such, treatment models should incorporate consideration of polysubstance use and co-occurring mental health disorders as there is a strong link between opioid use, increased risk of suicide and increased risk for co-occurring psychiatric disorders.[12]
3. **Strengthening Harm Reduction Infrastructure**
   There is an urgent need to expand harm reduction interventions (i.e., naloxone distribution, overdose prevention education, and community-based initiatives) in neighbourhoods where overdose is more likely to occur. Data gathered from the national surveillance system indicates that synthetic opioid overdose deaths continue to be common, particularly with regard to deaths related to fentanyl.[1] [7] Community-based harm reduction programs should be treated as primary public health interventions rather than as secondary or ancillary services, particularly in areas experiencing a high concentration of overdose deaths.[6] [14]
4. **Incorporate Substance Use, Mental Health, and Social Services**
   Due to the high number of people who have both a mental health disorder and a substance use disorder, it is important that we use integrated models of care. When services are delivered in a

fragmented way, patients do not receive consistent care, which negatively impacts long-term recovery.[15] By co-locating treatment for substance use disorder, mental health support, and social services, barriers can be removed and outcomes can be improved, especially for individuals who are experiencing homelessness or who are unemployed.[12] [13]

5. **Create Policies that will Address Structural Determinants Across Sectors**
   To continue reducing the harmful effects of substances, we need to implement policy changes at the upstream level that will improve housing stability, provide employment opportunities, and develop larger social safety nets. The literature on social determinants of health indicates that structural inequities lead to differences in how sick we become and how long we live.[5] [11] Therefore, public health agencies must work with the housing, labour, and criminal justice sectors to implement comprehensive strategies that reduce structural vulnerability and develop an environment conducive to recovery.[9] [10]

Conclusion

Substance and drug abuse are widespread, difficult challenges facing the city of Newark. This study highlights some of the specific wards affected by opioid-related harm and demonstrates that persons who suffer from addiction in those wards experience harms differently depending on their socio-economic status, among other factors.[6] [7]

In addition to existing evidence-based interventions (e.g., medication-assisted treatment and harm-reduction initiatives), other measures have proven less effective when implemented without consideration for local context or larger social determinants of health.[8] [16] Therefore, in order to meaningfully address substance-use problems in Newark, we need to shift away from an individual-focused model to a more neighbourhood-based, inequitable public health approach.[13] [5]

In order for us to address the issues of disparity brought about by the use of substances and to positively impact the health of our population, we must create a holistic system that combines interventions at all four levels, including prevention, harm reduction and treatment availability as well as structural interventions. This research has contextualized substance use according to both its social implications and the way these aspects play out spatially within the population which can help inform how to best implement local public health initiatives. This adds to the body of work already done in urban health showing the need for location-based solutions to public health crises.[10] [9]

Strengths and Limitations

Strengths

The strength of this study is that it takes place- or neighbourhood-level view of public health, which agrees with existing evidence that demonstrates the impact of area-level factors on health status.[1] [2] Since the study examined differences between Newark's wards, the data will allow local public health

officials to see where the geographic disparities exist, allowing them to better plan for their site's populations.

Secondly, the use of socio-ecological theory (or framework) strengthens the analytical approach of understanding how social determinants of health and the environment in which people live are integrally linked to one another. This is an emerging emphasis in public health research and practice, which identifies the effects of social policy on using substances and their effects in neighbourhoods.[5] [13]

Third, many credible data sources were utilized in the study, including state surveillance systems and national epidemiological reports from the CDC.[1] [12] This triangulation not only strengthens the study's credibility, but also establishes consistency between local studies and national trends for synthetic opioid involvement.[6] [14]

Lastly, an important strength of this research was how explicitly it ties findings to actionable policies. These findings support the recommended use of evidence-based treatments [e.g., medication-assisted treatment or integrated care model of treatment] in the area of public health.[8] [16]

Limitations

Limitations must be taken into account. First, to perform this analysis the authors depended on literature review (secondary) data for all variables, which means important aspects like: lived experience of using substances; informal social supports; and community perceptions, could not be derived from that literature.

Second, while the authors were able to find an association between neighbourhood characteristics and substance related harms, and these result are consistent with general public health theory.[5] [10] cause and effect could not be determined.

Third, the authors found that surveillance data regarding overdose (both non-fatal overdose and those using substances that would be less likely to receive emergency care) may not accurately reflect the number of overdoses due to issues like under-reporting and/or misclassification of the event. The authors also state that the differences in the number of available resources in the different wards may impact the way in which events are detected and reported, thereby impacting the identification of the geography of these events.[13]

Lastly, while the ward map is an illustrative representation of the wards in the city of Winnipeg, it is not a geographically accurate representation of the wards. Future research using advanced geospatial/longitudinal methods may provide a more accurate neighbourhood-based analyses and outcomes as they relate to the structural determinants of substance-related harm.

Despite the limitations, the study provides a substantial contribution to the understanding of how substance use can be addressed from a public health perspective, has merit as a theoretically based

policy document, and productive contribution to our understanding of substance use as a neighbourhood patterned public health concern in a metropolitan area.

Declarations

Ethics approval and consent to participate

Not applicable. This study utilised publicly available, de-identified secondary data.

Consent for publication

Not applicable.

Availability of data and materials

All data analysed in this study are publicly available from state and federal public health sources.

Competing interests

The author declares no competing interests.

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Authors' contributions

The author conceived the study, conducted the analysis, and drafted the manuscript.

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Figures

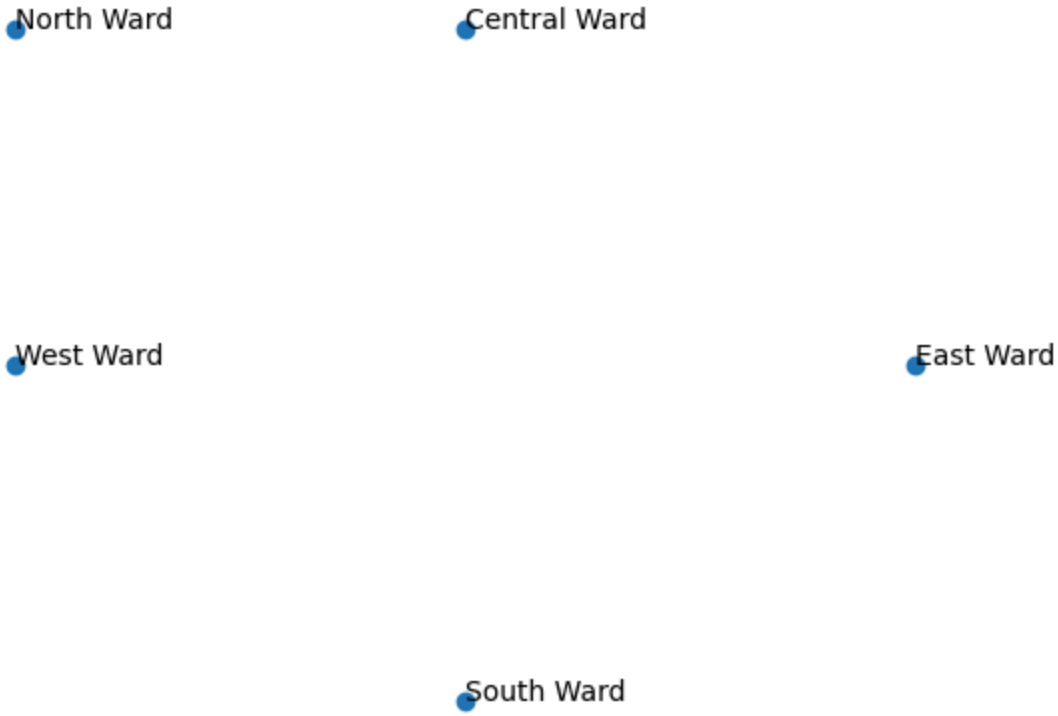


Figure 1

Diagrammatic Map of Newark Neighbourhood (Wards)

Source of Data: Newark municipal ward classifications and publicly available government planning documents.[12] Map made by the author for descriptive purposes.

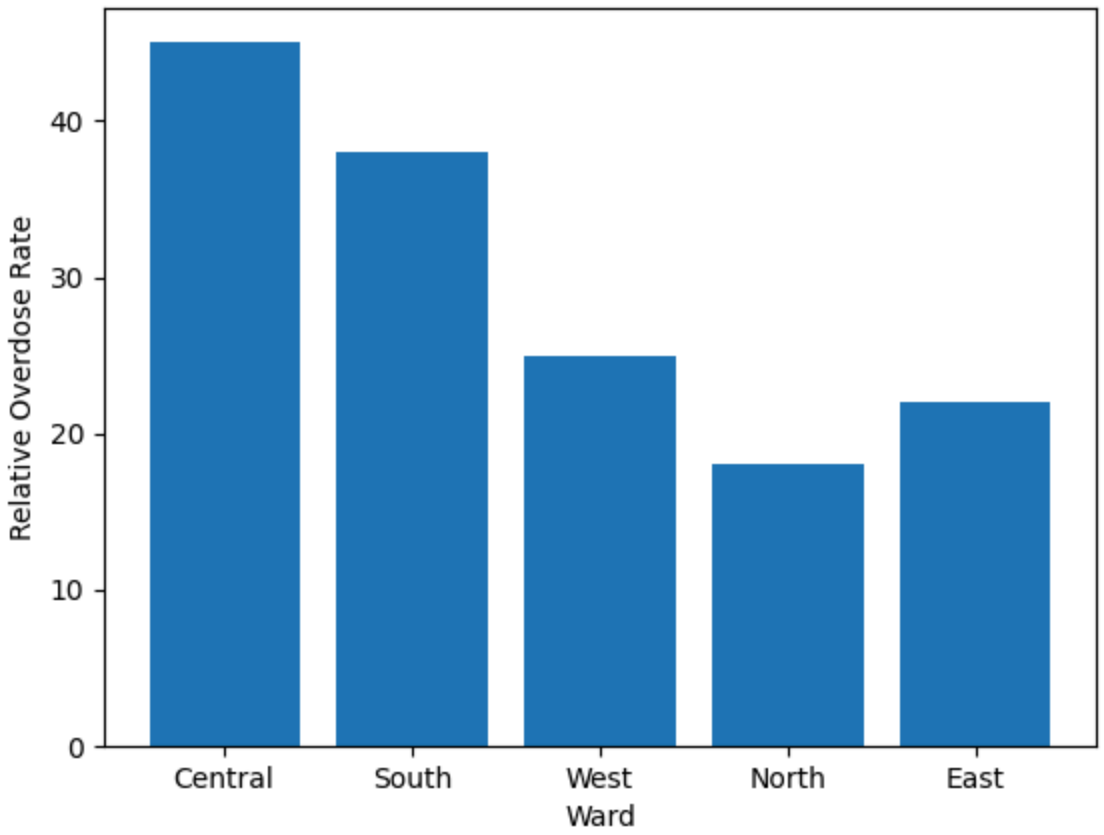


Figure 2

Opioid-related overdose mortality by Newark ward

Data source: New Jersey Department of Health overdose surveillance reports and publicly available state mortality data.[1] [12] Values represent relative comparisons across wards rather than absolute mortality counts.

Supplementary Files

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