

# A Retrospective Analysis of Illicit Drug Toxicity Deaths in New Brunswick, 2006-2016

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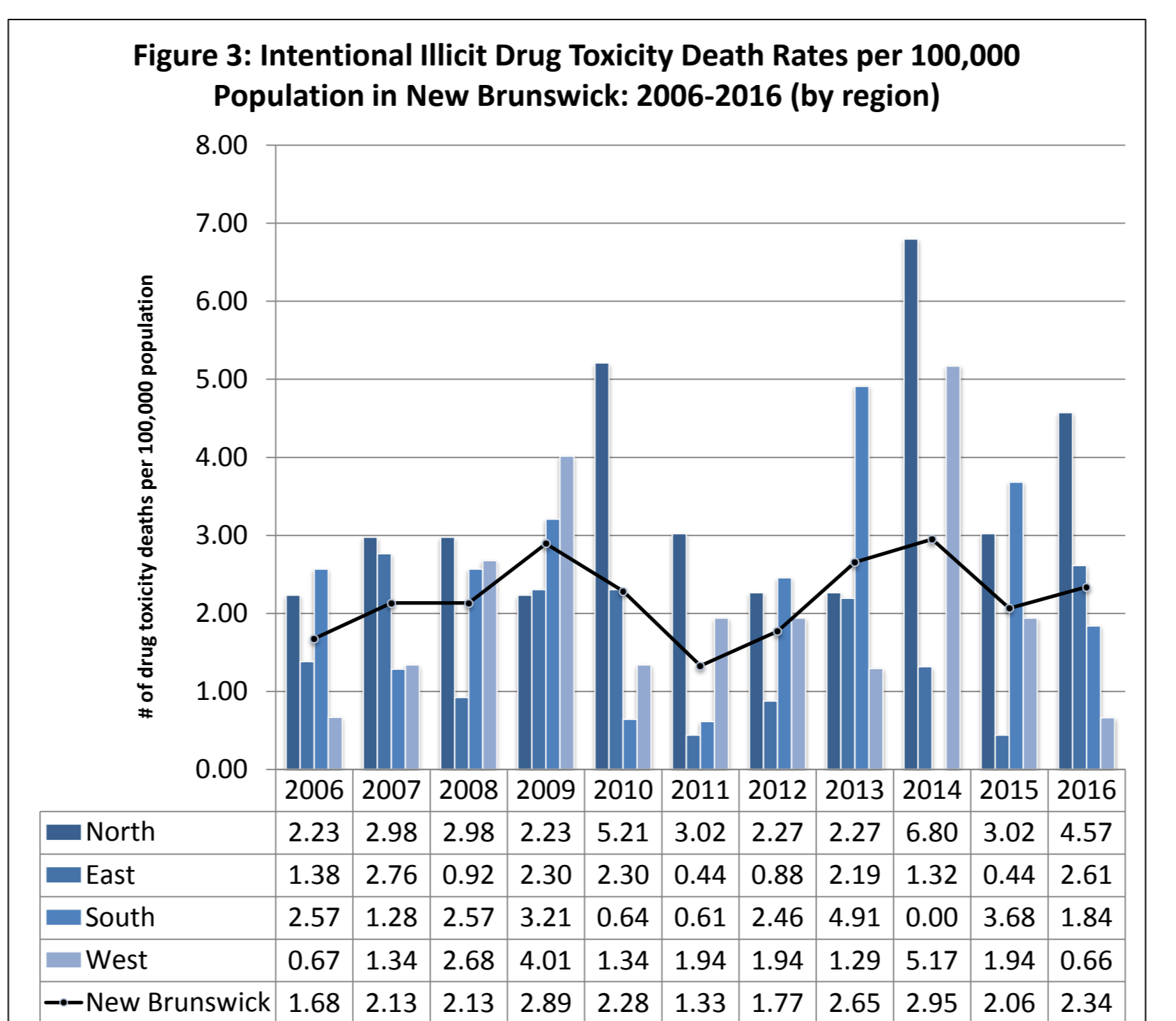
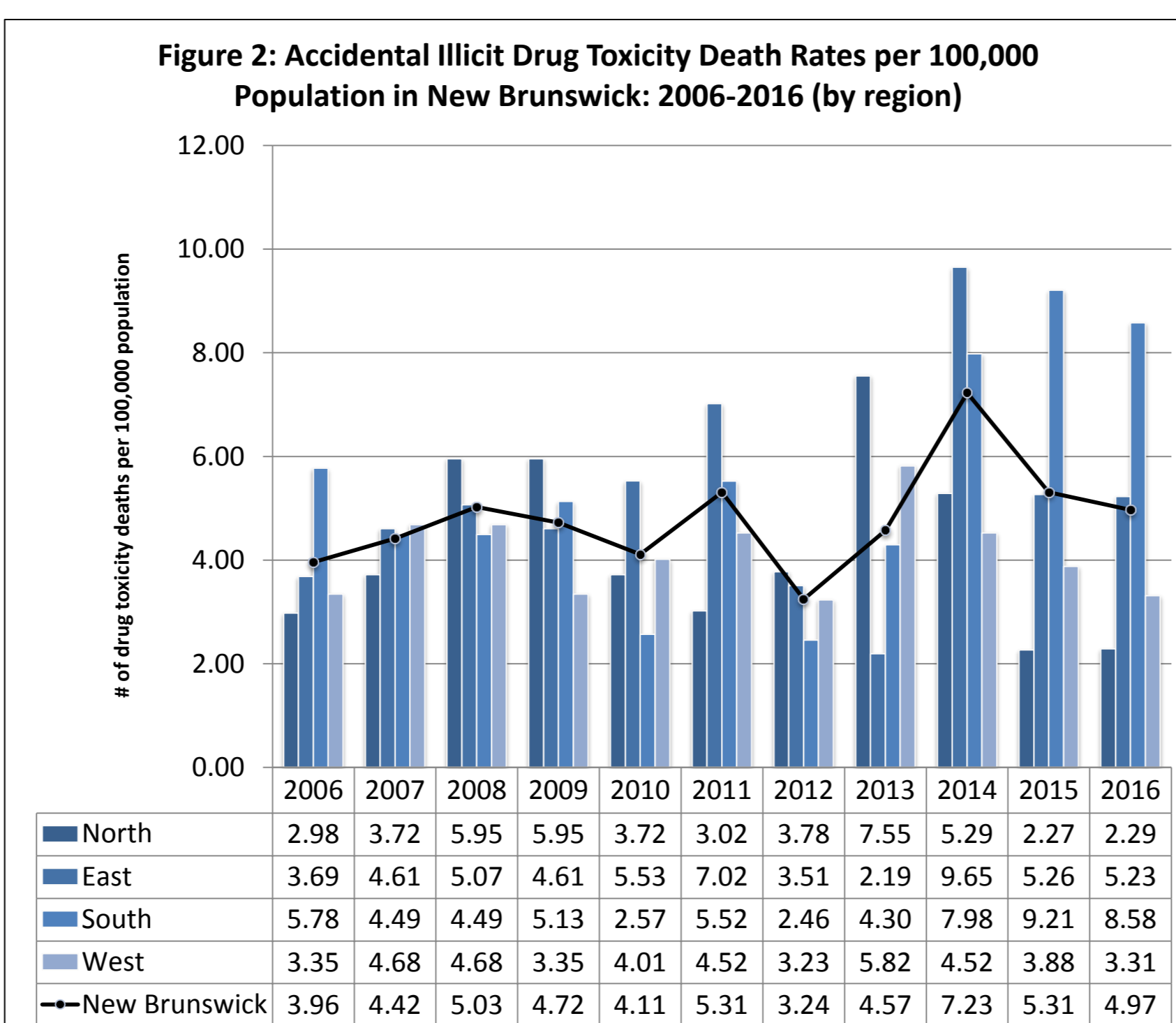
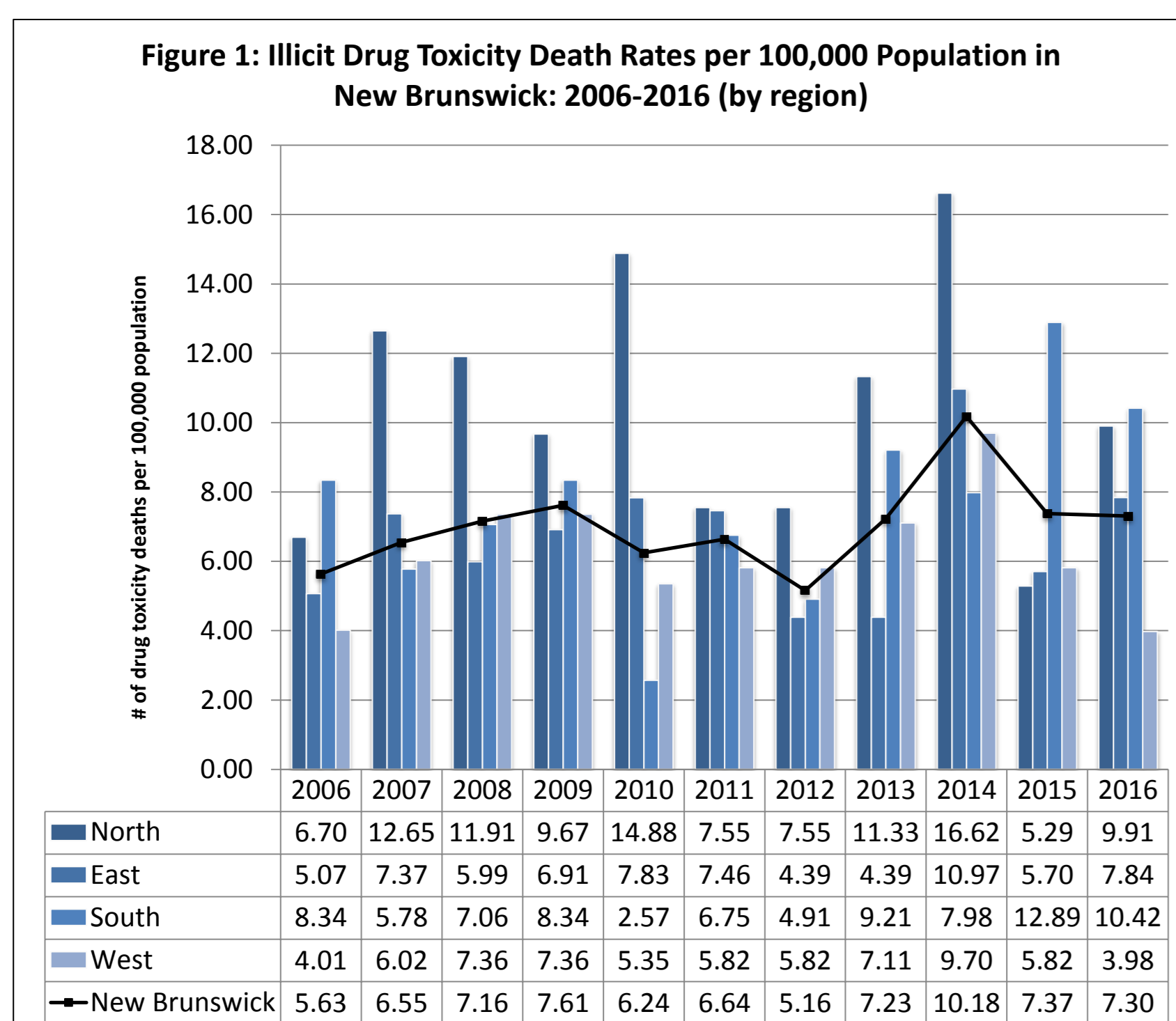
## BACKGROUND:

- Illicit use of both street and prescription drugs represents a significant problem in Canada and has become a major source of drug toxicity deaths and associated morbidity in Canada.<sup>1</sup>
- Growing numbers of individuals with substance use disorder are noted in New Brunswick, though detailed data are lacking with regards to the extent of illicit drug-related mortality in New Brunswick in comparison to other jurisdictions as well as regional comparisons between geographic areas in the province.
- Studies suggest an increasing trend for the combined use of multiple illicit substances, which suggests that the rate of accidental illicit drug deaths (IDDs) will likely continue to rise.<sup>2</sup>
- Data pertaining to drug toxicity mortality and the associated illicit drugs may help guide patient-centered prevention strategies.<sup>3</sup>

## METHODS:

A retrospective review of all accidental, intentional and undetermined illicit drug toxicity deaths which occurred between January 1, 2006 and December 31, 2016 was conducted in collaboration with the Coroner Services department in New Brunswick using final coroner reports issued on each death. A drug toxicity death was classified as illicit if it involved any drug produced, trafficked and/or consumed illicitly or in excess of prescribed quantities including opioids (e.g. morphine, heroin, methadone, fentanyl), other central nervous system depressants (e.g. barbiturates, nonbarbiturate depressants, benzodiazepines), central nervous system stimulants (e.g. cocaine, crack cocaine, amphetamines), and hallucinogens (e.g. LSD, PCP). Deaths were also captured if the monodrug toxicity death was caused by a drug found not to be prescribed to the individual.

Data was captured on each death including age, gender, location at the time of death, date of death, type of death (accidental, intentional or undetermined), prior medical conditions, contributing factors, prescribed medications at the time of death (if available), type of drug toxicity death (polydrug vs. monodrug), and toxicology results. Drugs found were categorized for analysis as listed in Table 1. For the purposes of comparison, New Brunswick was divided into 4 regions: north (Madawaska, Restigouche and Gloucester counties), east (Albert, Westmorland, Kent and Northumberland Counties), west (Victoria, Carleton, York, Sunbury and Queens Counties), and south (Kings, Saint John and Charlotte Counties). General descriptive statistics were presented as proportions, medians or means, as appropriate. Rates were calculated by year using the most recent Statistics Canada Census population numbers available for each year (e.g. Census 2006 numbers used for 2006-2010).

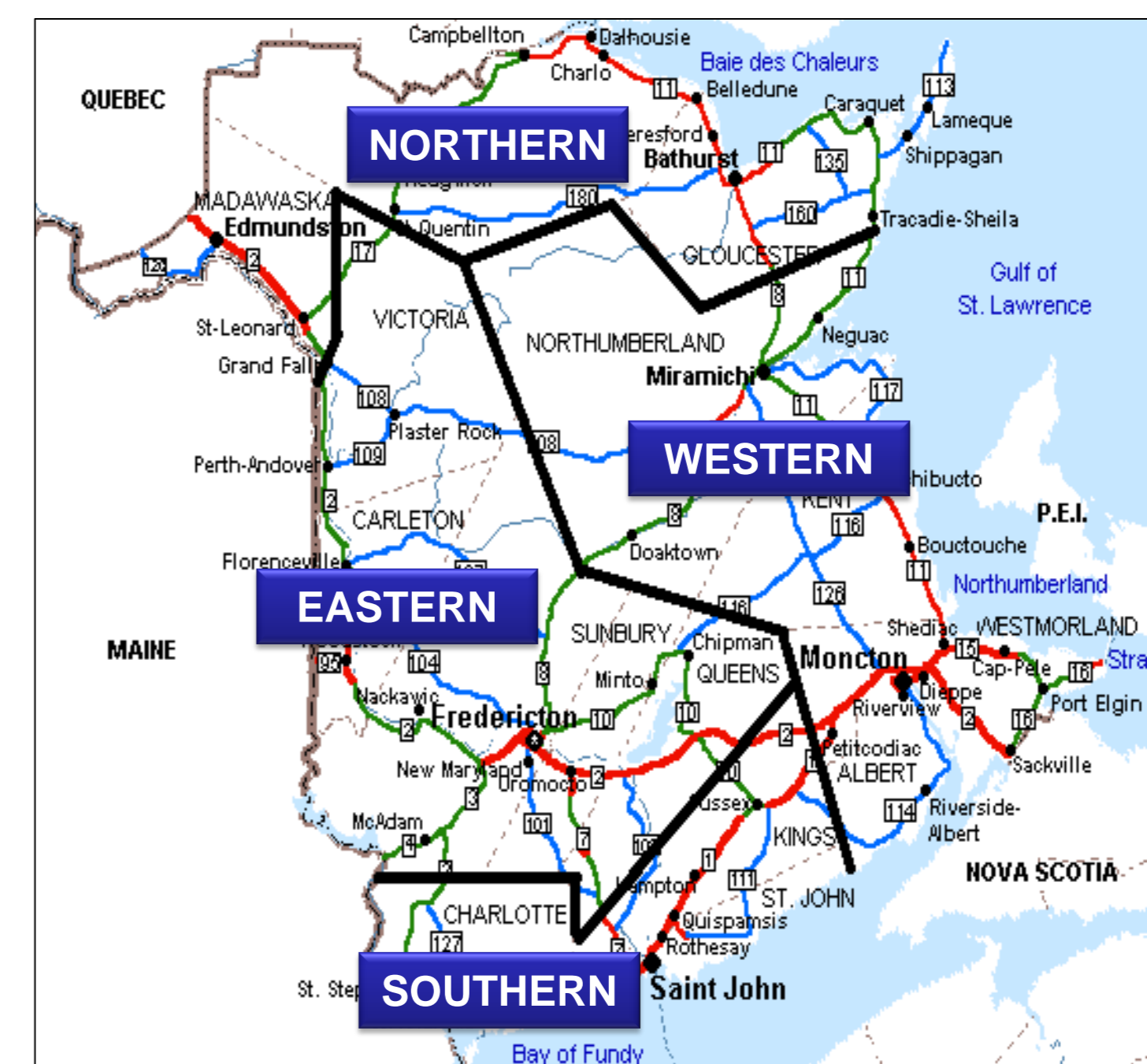


**Table 3: Top 3 counties with the highest average drug toxicity death rate (2006-2016)**

|             |                |
|-------------|----------------|
| Overall     | 1. Saint John  |
|             | 2. Restigouche |
| Accidental  | 1. Saint John  |
|             | 2. Victoria    |
| Intentional | 1. Restigouche |
|             | 2. Saint John  |
|             | 3. Gloucester  |

**TABLE 1: PRESCRIPTION AND TOXICOLOGICAL DRUG CATEGORIES CAPTURED**

|  |  |
|--|--|
| Benzodiazepines  | Opioids (excl. fentanyl, opiate substitution therapy (OST))  |
| Fentanyl   | OST (methadone, buprenorphine)   |
| Cocaine  | Methamphetamines   |
| Prescription sleep aids (e.g. zopiclone, trazodone)          | Prescription muscle relaxants (e.g. baclofen, cyclobenzaprine)   |
| Selective serotonin reuptake inhibitors (SSRIs)              | norepinephrine-dopamine reuptake inhibitors (NDRI)/noradrenergic and specific serotonergic antidepressants (NaSSA) |
| Other (tricyclic antidepressants, buspirone, antipsychotics) | Central nervous (CNS) system stimulants  |



**TABLE 2: CHARACTERISTICS OF ILLICIT DRUG OVERDOSE DEATHS**

|                                   | Overall (n=516) | Accidental (n=354) | Intentional (n=161) |
|-----------------------------------|-----------------|--------------------|---------------------|
| Mean age in years (SD)            | 45.6 (13.9)     | 44.1 (14.1)        | 49.1 (12.6)         |
| % female                          | 42.1            | 38.2               | 50.6                |
| % classified as monodrug toxicity | 35.0            | 33.8               | 37.7                |
| % with a noted history of:        |                 |                    |                     |
| Alcohol abuse                     | 22.5            | 23.1               | 21.1                |
| Drug abuse                        | 50.9            | 63.0               | 26.1                |
| Past overdose(s)                  | 6.3             | 6.1                | 6.9                 |
| Depression                        | 39.7            | 28.7               | 63.8                |
| Chronic pain                      | 20.2            | 21.1               | 18.1                |
| Suicide attempt(s)                | 17.3            | 5.4                | 43.5                |

**TABLE 4: DRUGS IDENTIFIED IN TOXICOLOGY AMONG ACCIDENTAL POLY-DRUG OVERDOSE DEATHS (OVERALL AND BY REGION)**

|               | Benzos | Opioids | Fentanyl | Cocaine | Meth-amphetamines | OST   | Sleep Aids |
|---------------|--------|---------|----------|---------|-------------------|-------|------------|
| North         | 61.1%  | 63.9%   | 2.8%     | 25.0%   | 8.3%              | 5.6%  | 2.8%       |
| East          | 54.8%  | 60.7%   | 6.0%     | 33.3%   | 17.9%             | 26.2% | 7.1%       |
| South         | 60.9%  | 56.3%   | 0.0%     | 26.6%   | 6.3%              | 23.4% | 20.3%      |
| West          | 55.3%  | 72.3%   | 0.0%     | 21.3%   | 6.4%              | 8.5%  | 10.6%      |
| New Brunswick | 57.6%  | 62.3%   | 2.6%     | 27.7%   | 10.8%             | 18.6% | 10.8%      |

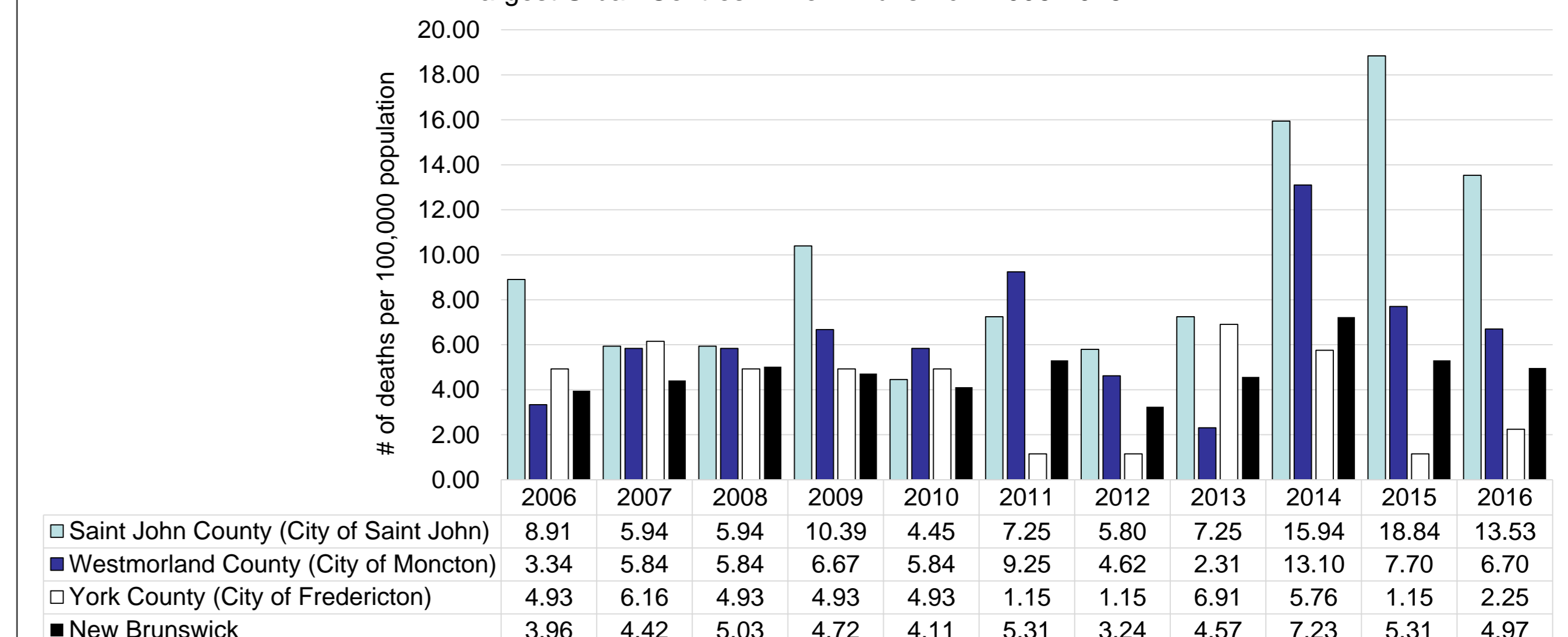
## RESULTS:

A total of 532 drug toxicity deaths occurred between 2006 and 2016 in New Brunswick, 516 of which met our definition for illicit drug toxicity. Accidental overdoses accounted for 68.6% of all deaths with baseline characteristics described in Table 2. As seen in Figure 1, Northern New Brunswick had the highest overall rates of illicit drug toxicity death in 8 of the 11 years analyzed. The highest rates in the most recent years (2015-2016) have been observed in Southern New Brunswick. This region of the province also had the highest rate of accidental overdoses during this same time period. Intentional drug toxicity rates tend to be much more variable by year though the northern part of the province did tend to have higher rates than other regions. Rates were also calculated by County [data not shown], with the highest rates in each category of drug toxicity outlined in Table 3.

Poly-drug accidental overdoses accounted for 45.8% (n=231) of all deaths and 65.3% of accidental drug toxicity deaths. In all regions, benzodiazepines and opioids (excluding fentanyl and OST) were found in the highest proportion of toxicology results among these deaths with a range of 54.8-61.1% and 56.3-72.3% of results positive for benzodiazepines and opioids, respectively. Prescription sleep aids are much more commonly found in Southern New Brunswick while the presence of methamphetamines is more common in Eastern New Brunswick. The presence of OST (i.e. methadone and/or buprenorphine) in accidental poly-drug toxicity deaths is much more likely in the Eastern and Southern regions of the province, though this may be due in part to greater availability of OST services in those areas. In 29.7% of accidental deaths (n=105), no opioids were found on toxicology.

Fentanyl accounted for very few deaths of the overall sample (1.9%, n=10), all of which were accidental. Sixty percent of fentanyl deaths (n=6) were classified as poly-drug and accidental. Fentanyl and cocaine (n=2) and fentanyl and benzodiazepines (n=2) were the most common drugs simultaneously present in the toxicology reports.

**Figure 4: Accidental Illicit Drug Overdose Deaths per 100,000 Population in Counties in the Three Largest Urban Centres in New Brunswick: 2006-2016**



## DISCUSSION & CONCLUSION:

In Canada, much of the presently available provincial and national drug toxicity death data reports solely on opioid-related deaths. While opioids are present in a significant proportion of illicit drug toxicity deaths, focusing solely on those deaths can result in a large number of illicit drug toxicity deaths not being captured. In the case of New Brunswick, this would exclude 105 cases, or nearly 30%, of all accidental illicit drug toxicity deaths.

Examination of the provincial rates by geographic region and county highlights the significant regional differences in the burden of fatal illicit drug overdoses. In consideration of the concerns surrounding accidental overdoses secondary to the risk of a fentanyl tainted drug supply, the accidental overdose rates at a regional level should be of particular interest when planning for appropriate allocation of additional harm reduction resources during preparedness planning. As seen in Figure 2, rates in the Northern and Western areas of the province have largely remained below the New Brunswick provincial rate in contrast to the eastern and southern areas whose rates, particularly since 2014 have met or far exceeded the provincial rate. Examining the counties containing the three largest urban centres in the province in Figure 4 further illustrates the troubling rise in rates since 2014 in Saint John County specifically.

Findings suggest that further analysis should be performed to understand population characteristics, comorbidities and demographic factors in southern N.B. and Saint John County, specifically to identify factors which may be contributing to these higher rates. Further analysis should also consider types of poly-substance use detected on toxicology reports, with particular emphasis on lethal drug combinations, such as opiates and/or methadone used concurrently with benzodiazepines. Ultimately, the goal of studies moving forward should be to consider effective policies for safe prescribing methods, and access to resources available to at-risk populations across the province, and in Saint John. The urgency is heightened by the anticipated increase in deaths as fentanyl becomes more prominent in the province.

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