

When cultural differences breed a separate toxicological ecosystem: the province of Québec (Canada) and the opioids crisis

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Aim

The opioids crisis has been developing for several years now on the North American continent, showing no signs of slowing down. In Canada, the opioids crisis unfurled from West to East, starting with the province of British Columbia and making its way towards the province of Québec and Maritime Provinces. For the first time in decades, the average life expectancy in British Columbia has decreased, due to a surge in opioids related deaths.

Nonetheless, partial data released by the Chief Public Health Officer of Canada in October 2018 seemed to indicate that the province of Québec was relatively spared by the phenomenon. To check whether the postmortem casework treated at the *Laboratoire de sciences judiciaires et de médecine légale* corroborate this assessment, a retrospective study of cases involving opioids was performed.

Method

All postmortem cases for which at least one traditional or novel synthetic opioid was detected between January 2013 and December 2018 were included in this retrospective analysis. The date and location (postal code) of the event, age and sex of the deceased, cause of death and complete

toxicological results in all biological matrices including concentrations where available, were recorded. R (programming environment) and RStudio (graphical interface, Boston, Massachusetts, USA) were used to manipulate the database and extract descriptive statistics.

Results

A total number of 472 postmortem cases where at least one opioid was detected were identified, out of a total of 4 023 postmortem cases treated over the period covered. The percentage of cases involving opioids showed no upwards or downwards trend, varying between 10% and 15%. The deceased were predominantly males (63%). Older individuals were overrepresented with respect to the general population, with deceased between 0 and 19 years old constituting 1% of cases, 20 to 29 years old 11%, 30 to 39 years old 19%, 40 to 49 years old 21%, 50 to 59 years old 22%, 60 to 69 years old 15% and 70 years and older 10%.

The seven most prevalent opioids were heroin (6-monoacetylmorphine) (6% of cases), codeine (11%), fentanyl (17%), hydromorphone (31%), methadone (10%), morphine (25%) and oxycodone (17%). No upwards or downward trends in prevalence could be evidenced with passing years. Multiple opioid combinations could be observed in 25% of cases. All cases combined several toxicologically relevant compounds, with acetaminophen, cocaine, amitriptyline and clonazepam being the substances most detected in combination with opioids.

Novel synthetic opioids (NSO) were detected in 11 cases over the studied period, more specifically acetylfentanyl, furanylfentanyl and U-47700. Their prevalence seemed to increase over time, although the low number of cases makes it difficult to draw a definite conclusion.

Discussion

No evidence of the tell-tale increase in fentanyl prevalence over time could be observed in the gathered data, nor an increase in the absolute or relative number of postmortem cases involving at least one opioid. This seems to confirm the data published by the Chief Public Health Officer of Canada, and indicate that the opioids crisis has not materialized in the province of Québec, Canada.

However, toxicology analyses are not performed systematically postmortem, and before November 2018, part of the postmortem toxicology workload of a non-judicial nature was carried out by a different laboratory whose statistics are not included in the present study. This of course limits the inferences which can be drawn from the database.

Québec is the only province in North America whose official language is French. This relative cultural isolation seems to have an impact on the toxicological ecosystem observed. It was already

known that although the number of opioids prescription per capita was similar to other provinces, the defined daily dose was the lowest of all provinces. Additionally, statistics for driving under the influence of drugs (DUID) cases have shown for several years that stimulants (methamphetamine, cocaine) were more popular than opioids and benzodiazepines in Québec, a trend opposite to what was observed in the neighbouring province of Ontario.

It isn't the first time a "toxicological ecosystem" of the sort is observed in the province. Indeed, GHB was detected on average in 24% of all DUID cases analyzed over the 2013-2018 period. In the neighbouring province of Ontario, this number drops to less than 1%.

Conclusions

Statistics of opioids detected in postmortem casework in Québec (Canada) seems to confirm the preliminary published data suggesting that the opioids crisis has not taken hold in this province, making it Astérix's small village of indomitable Gauls holding out against the opioids invader. Further data compilation and analysis in the upcoming years will allow to keep an accurate portrait and pinpoint the emergence of specific trends amongst postmortem casework.