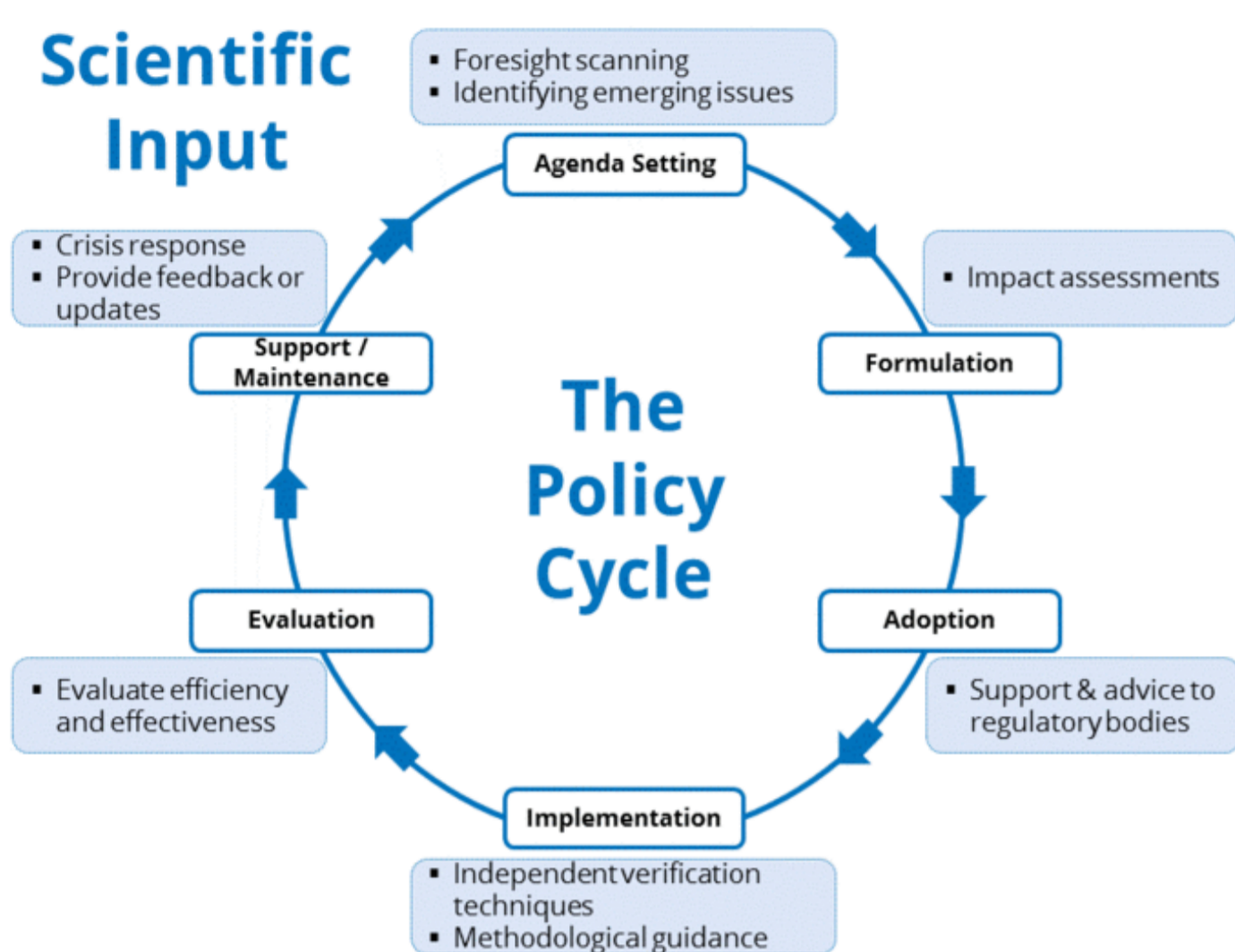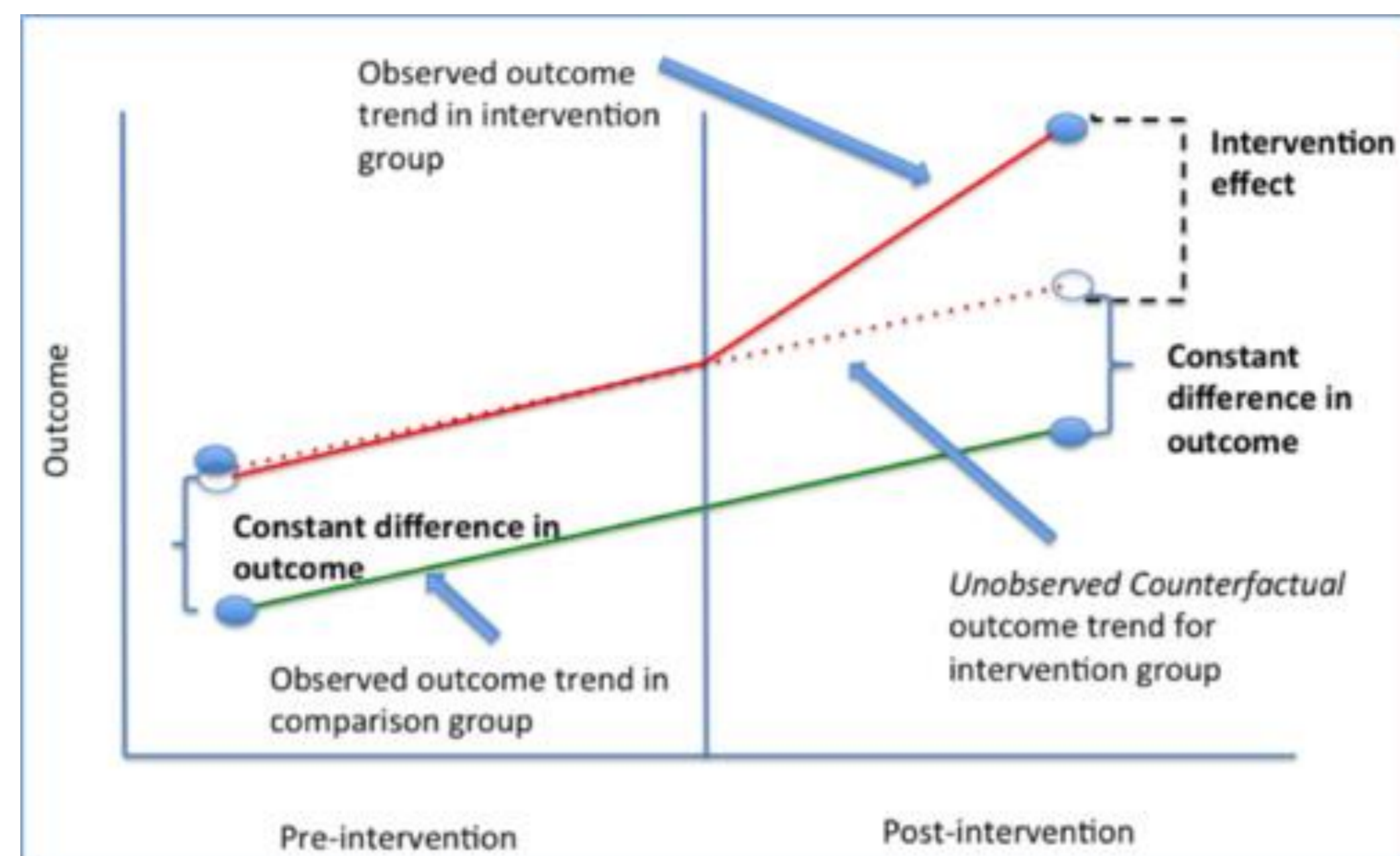# Evaluation of cannabis recreational law in traffic crash outcomes in Toronto: checking the trend assumption to properly apply a difference-in-difference model.

Introduction

Source: Connors S., 2016. GeoPolicy: Science and the policy cycle

Source: Columbia Public Health, 2022. Population health methods.

This presentation aims to visually explore how trends of crash outcomes in Toronto for a control and an intervention group compare to each other before the introduction of the Cannabis Act 2018.

Methods

To evaluate the effect of the Cannabis Act on traffic crash outcomes in Toronto a difference-in-difference approach can be applied. For this however one assumption must be met: the parallel trend assumption

We defined:

1) Pseudo-intervention group: between July 1st, 2018, and March 31st, 2019.
2) Pseudo-control group: between July 1st, 2016, and March 31st, 2017.
3) Outcomes (data source: Toronto Police Service Public Safety Data Portal):
   a) Total number of crashes.
   b) Road victims.
   c) Killed or severely injured.

For the data analysis, we followed the next steps:

1) Construction of a database as panel data differentiating events per:
   a) Day
   b) Territory (district and city)
2) Determination of rates of each outcome using as denominator the population of all Toronto and each district reported by the year 2016 adjusted by population growth per 1 million inhabitants.
3) Estimation of the unadjusted average rate of each outcome by month with a CI 95% of the mean.

Results

Figure 1: Average rate of crashes by month per 1M of inhabitants (CI 95%) in periods pre-implementation of CCA.
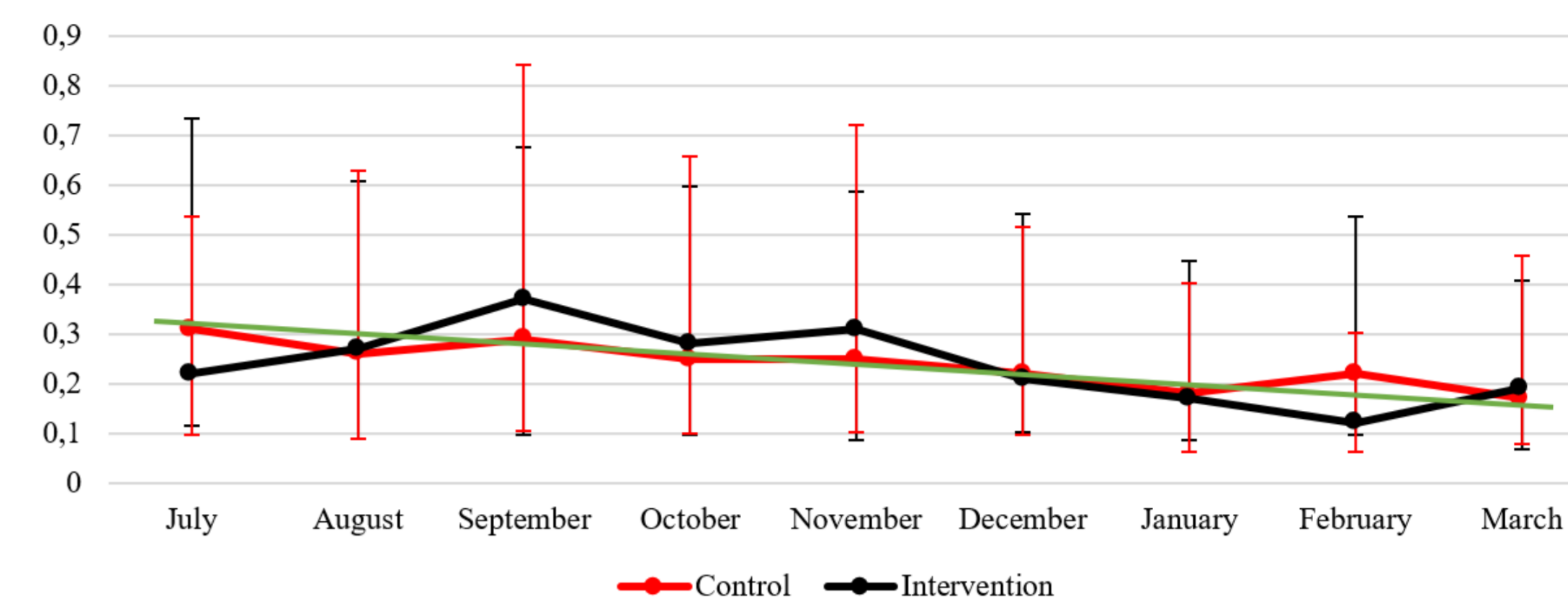

Figure 2: Average rate of road victims by month per 1M of inhabitants (CI 95%) in periods pre-implementation of CCA.
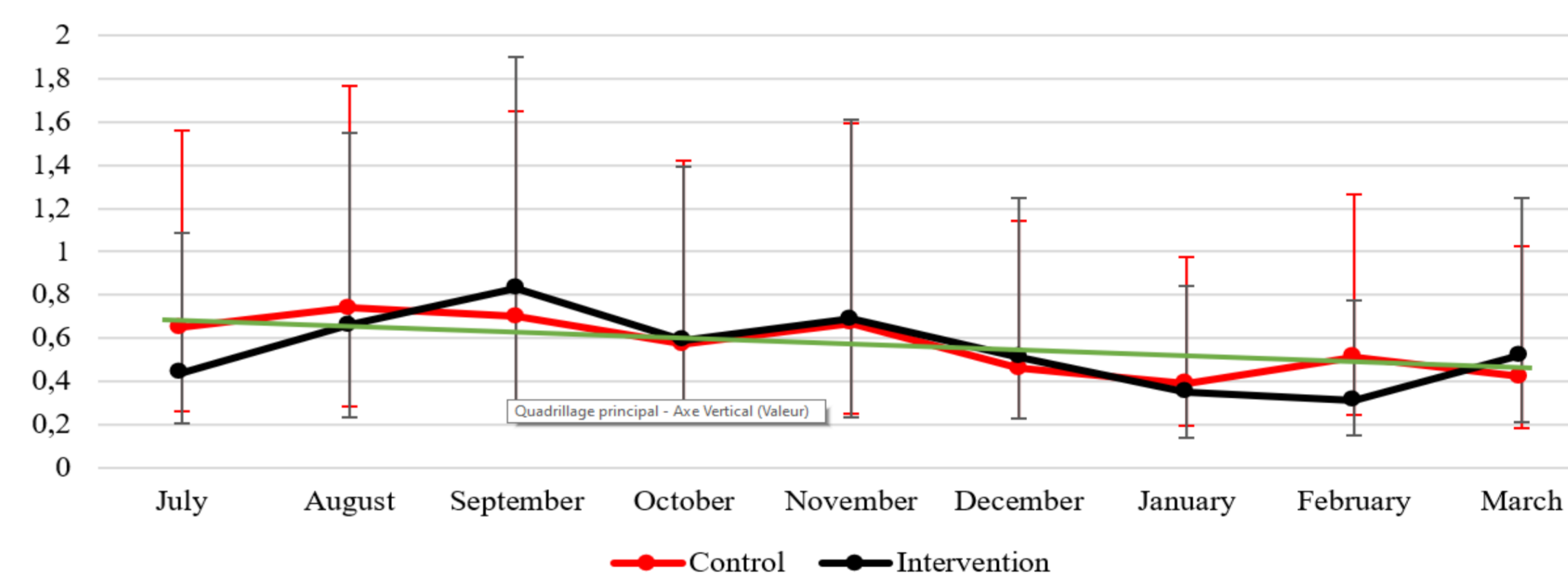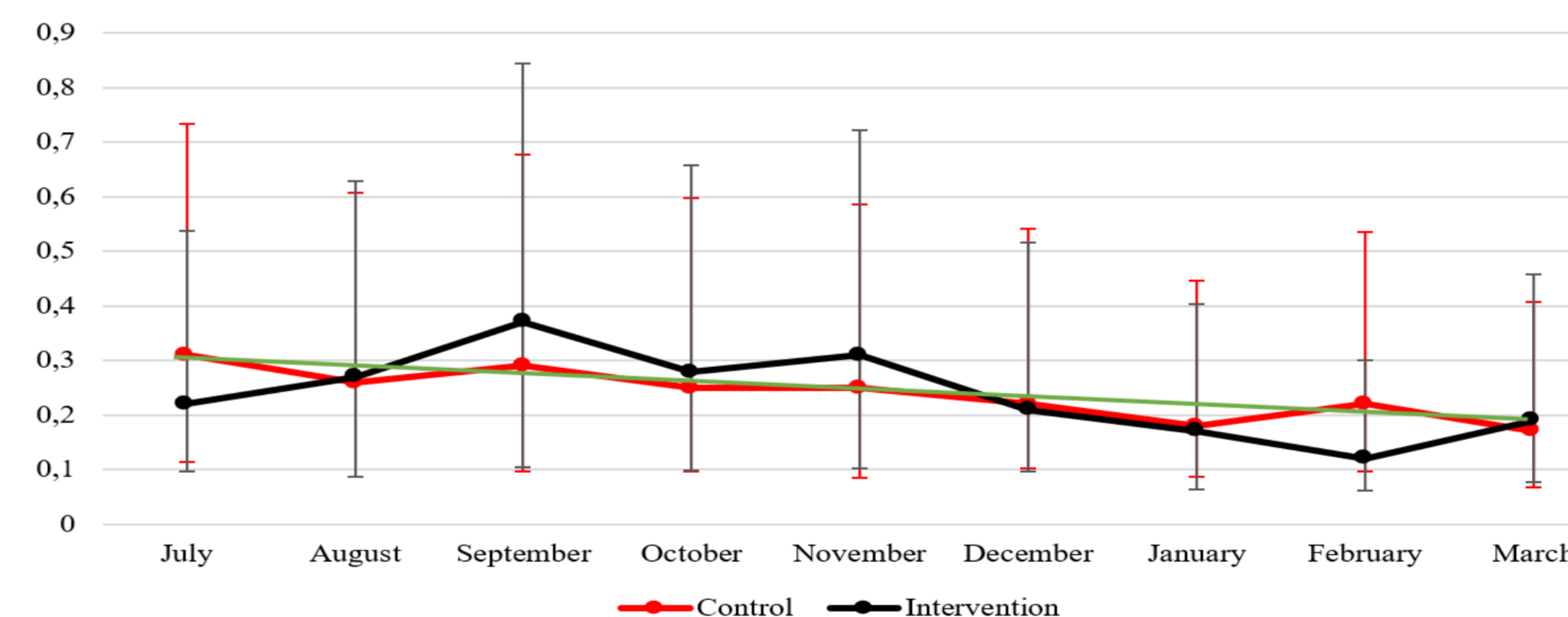

Figure 3: Average rate of KSI by month per 1M of inhabitants (CI 95%) in periods pre-implementation of CCA.

Discussion

- Exploring the data, we observed that the assumption is met.
- Testing this assumption allows us to advance to the next steps of the assessment.