Large-scale aggregation of automatic cycle counter data to evaluate the impact of Places for Everyone active travel infrastructure in Scotland

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Places for Everyone

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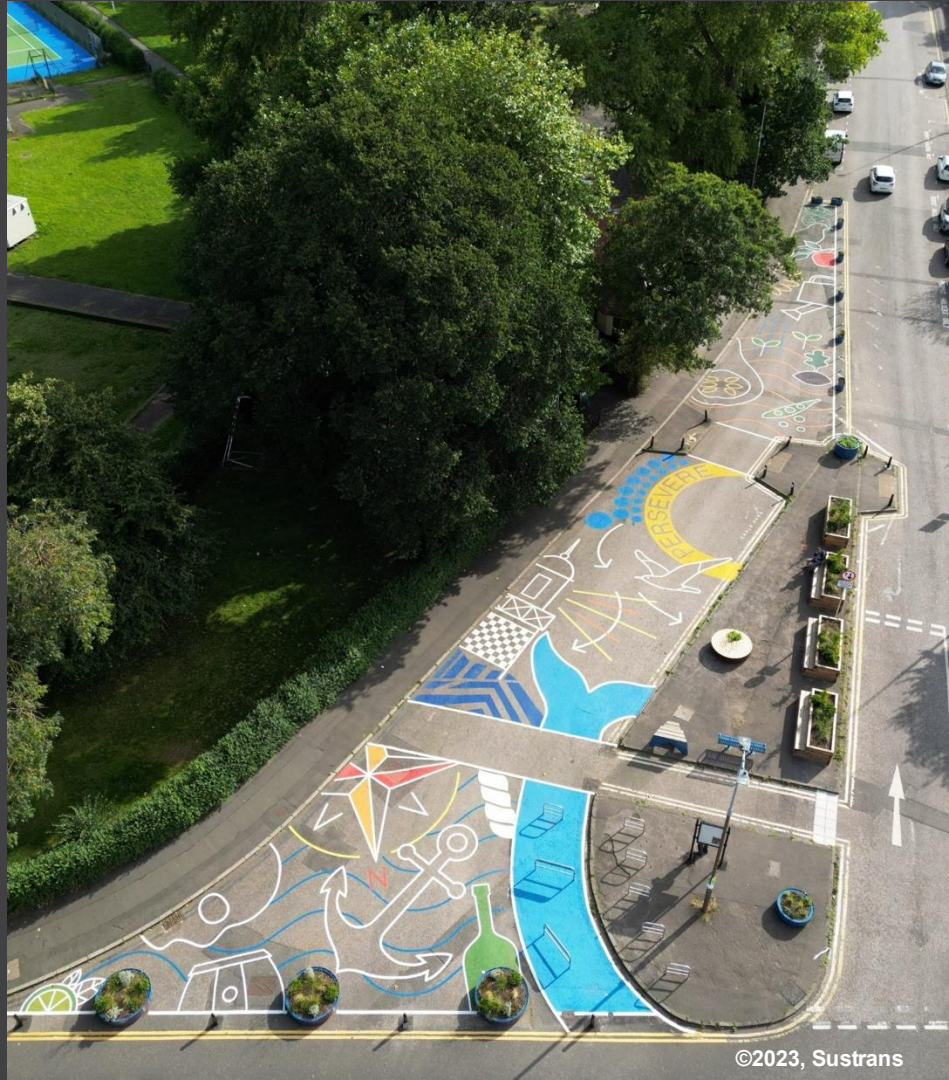

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Sustrans and Places for Everyone

- Sustrans is the charity making it easier for everyone to walk, wheel and cycle.
- One of our major programmes of work is Places for Everyone.

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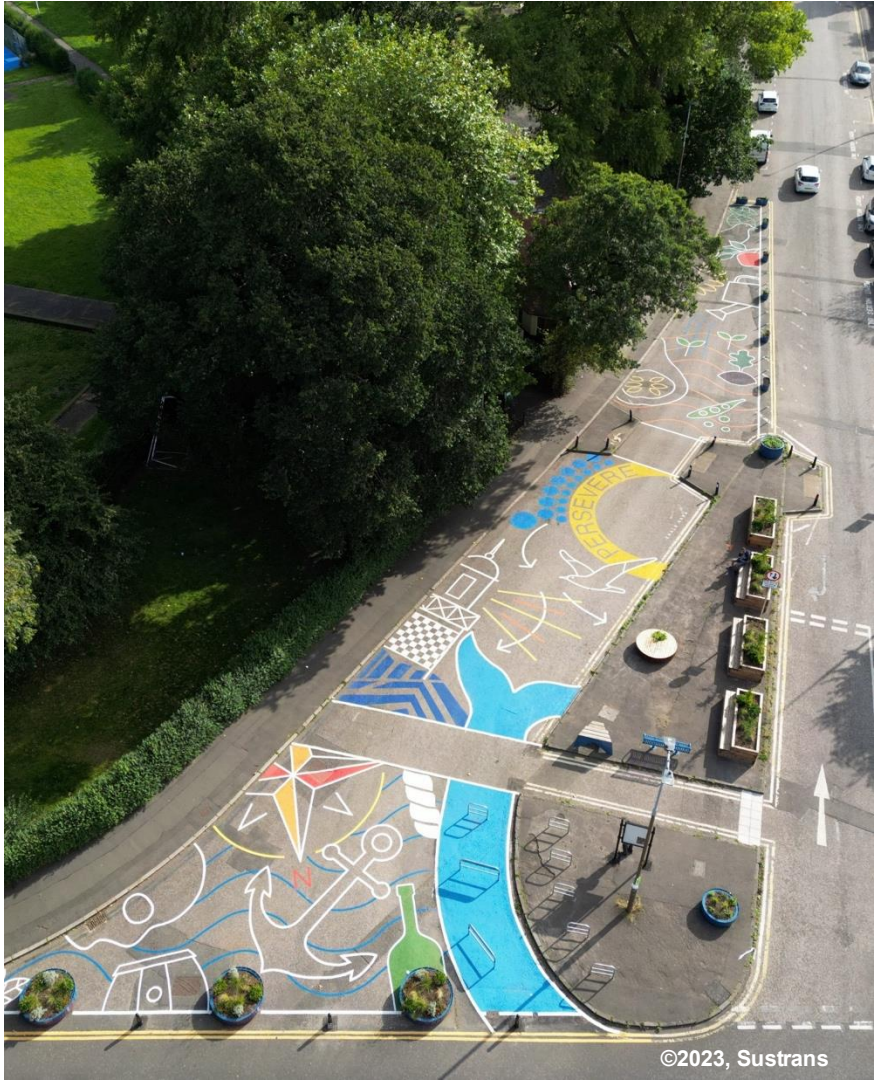

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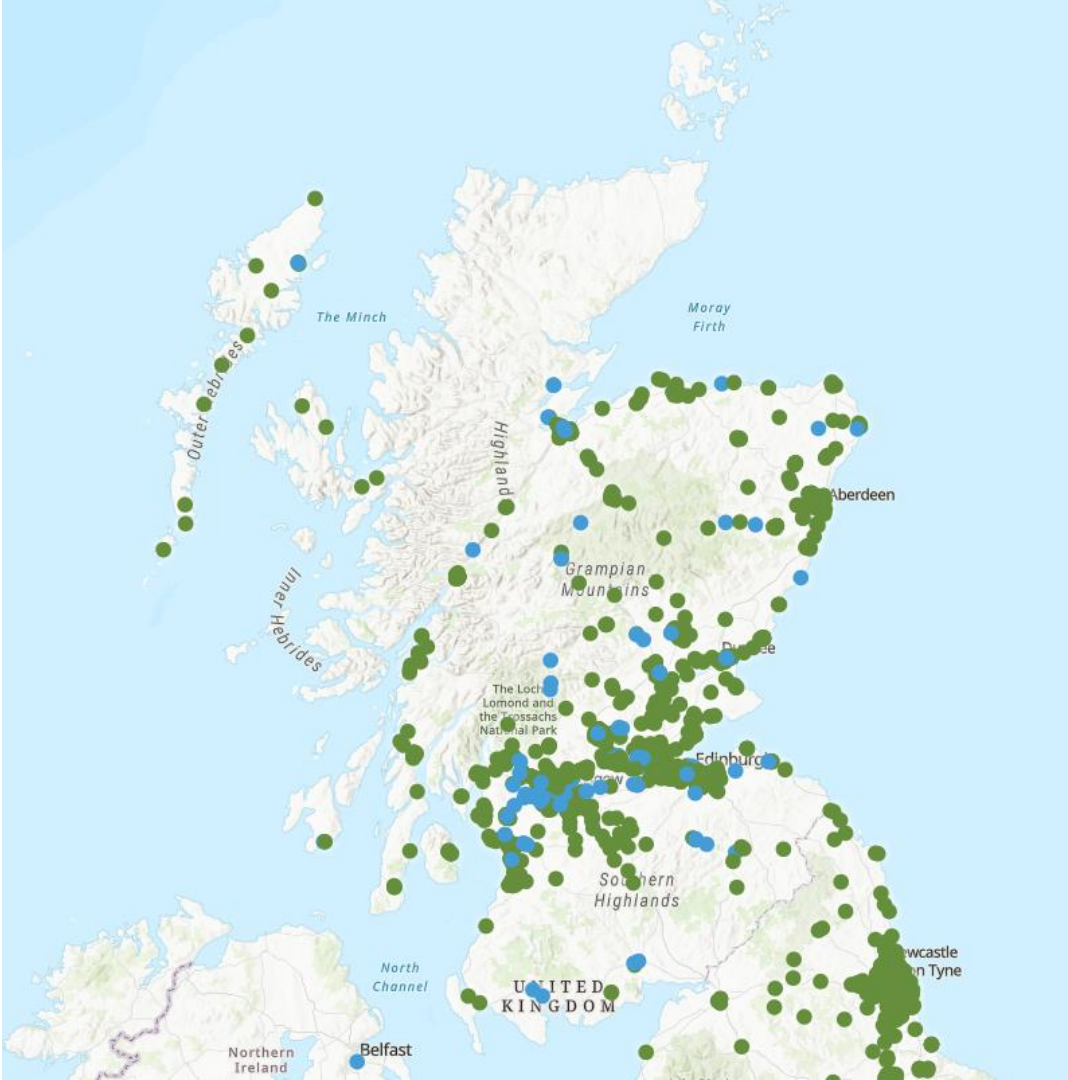
Evaluation of Places for Everyone

- We evaluate the impact of the whole Places for Everyone programme annually
- One of the key outcomes we evaluate is: Increase the number of people choosing walking wheeling and cycling in Scotland
- What I'm now going to talk about is a new method that we tried to evaluate this outcome.

Automatic counter network

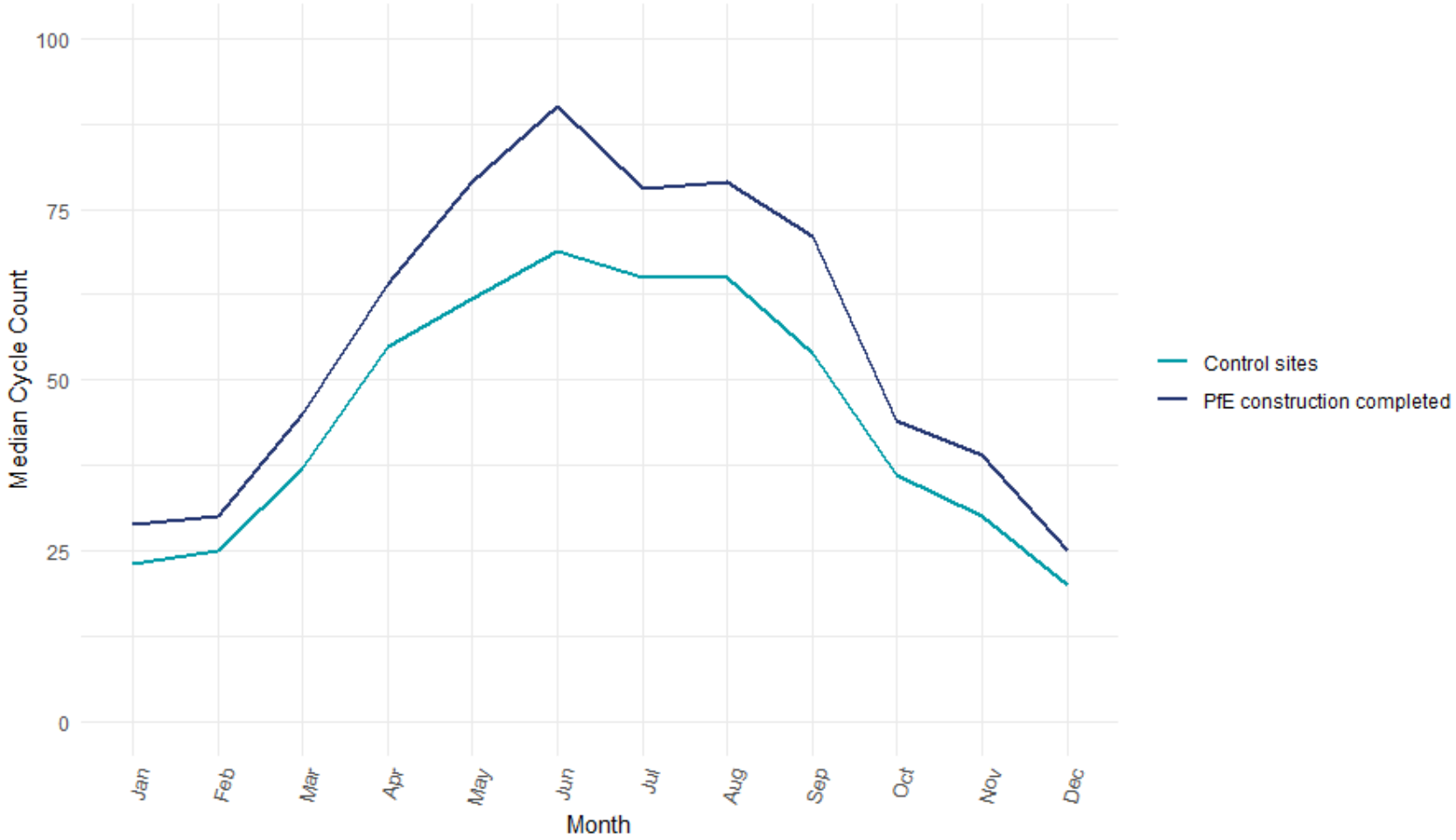
- We have access to data from over 1000 counters
- Can we use this to evaluate Places for Everyone?



Methods

- We had access to approx. 1000 counters in Scotland.
- Those on PfE schemes were assigned as ‘intervention’ counters.
- Those not on PfE schemes were assigned as ‘control’ counters.
- Data cleaning:
  - Drop counters with no data
  - Run some automated processes
  - Visually inspect data from many counters graphs
  - Matching counter characteristics: rural or urban, leisure or utility route.

Monthly median daily cycle count



Results

- On constructed PfE sites, the median number of daily cycles is 24% higher than control sites without a project.
- 29 completed PfE projects were included.
- For completed projects, we used data from between 39-44 counters. For control sites, we used between 507-542 counters. The number of counters varies per month as not all counters have data for every month of the year.



Caveats

- The urban / rural categories that we used are very broad e.g. an ‘urban’ site could be a small town or a large city.
- It could be that PfE projects are just built in the busiest urban areas. Higher use may reflect greater population density.
- We can't infer any causation that PfE projects have created this difference. We can only suggest.
- Analysis is weighted towards the counters with the most data because (ie a counter with two Januarys of data will have twice the effect on the median than a counter with just one January).



How to improve the analysis?

- This is an exploratory process and a work in progress. It has great potential. We will make improvements next year.
- Hopefully more projects will install counters pre-construction, thus making a difference-in-differences analysis approach more feasible. This would greatly increase the strength of our conclusions.
- Bringing more variables into the analysis e.g. population density, and using regression modelling would increase the certainty of our conclusions.
- Computing power can be limiting, counter maintenance, lots of manual processes to put together the data set.

Places for Everyone legacy

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- PfE has delivered almost 180km of cycle, pedestrian, or shared use paths since 2016-17.
- 10% of the population of Scotland (565,000 people) now reside within 500m of high-quality infrastructure constructed through PfE.
- Casualty rates have decreased at PfE project sites after projects are delivered, and route users perceive sites as safer.
- 16% increase in walking levels at PfE projects.
- Schools with a PfE project within 500m have substantially higher rates of active travel to school compared to the national average.

Acknowledgements

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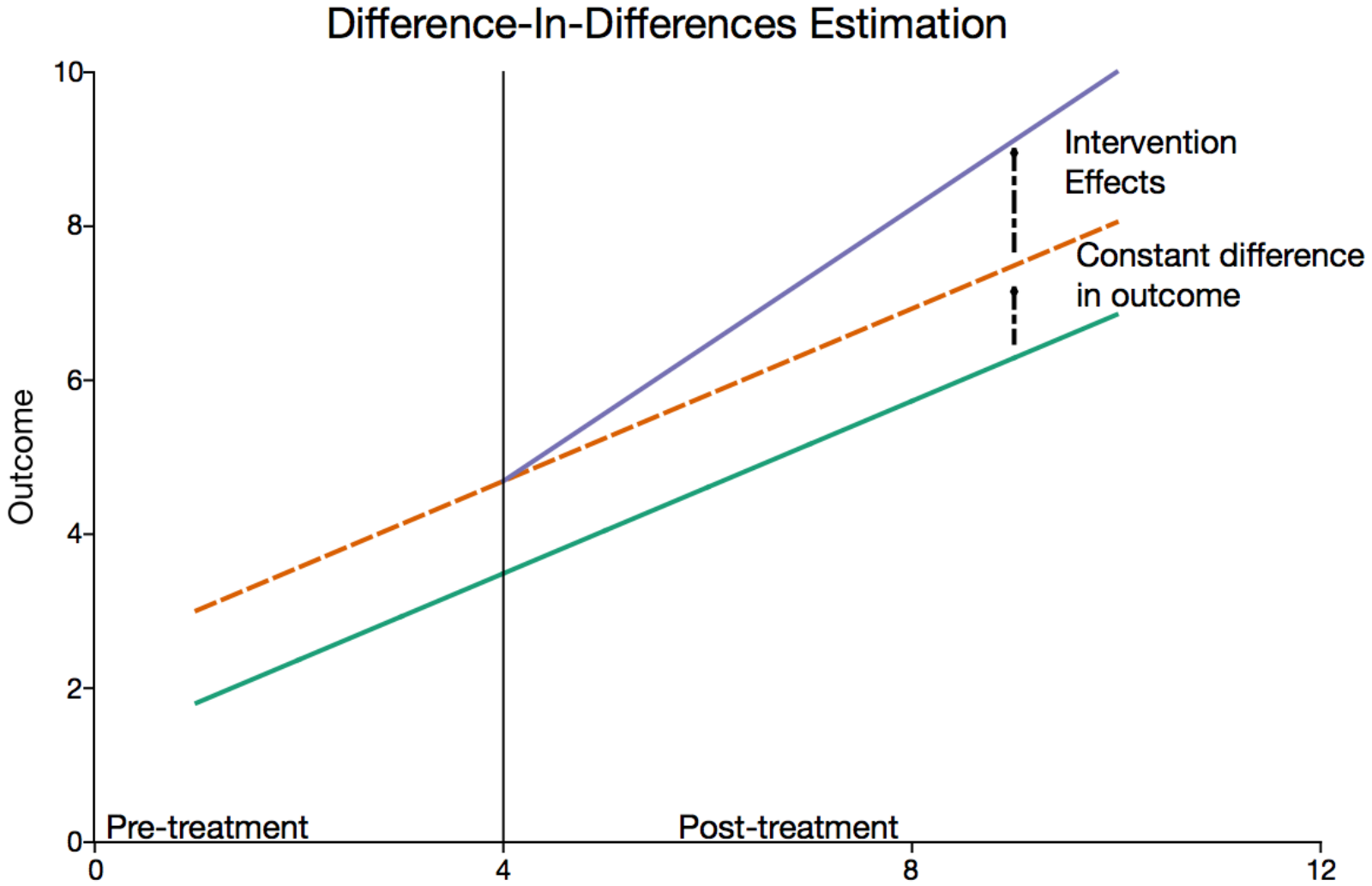
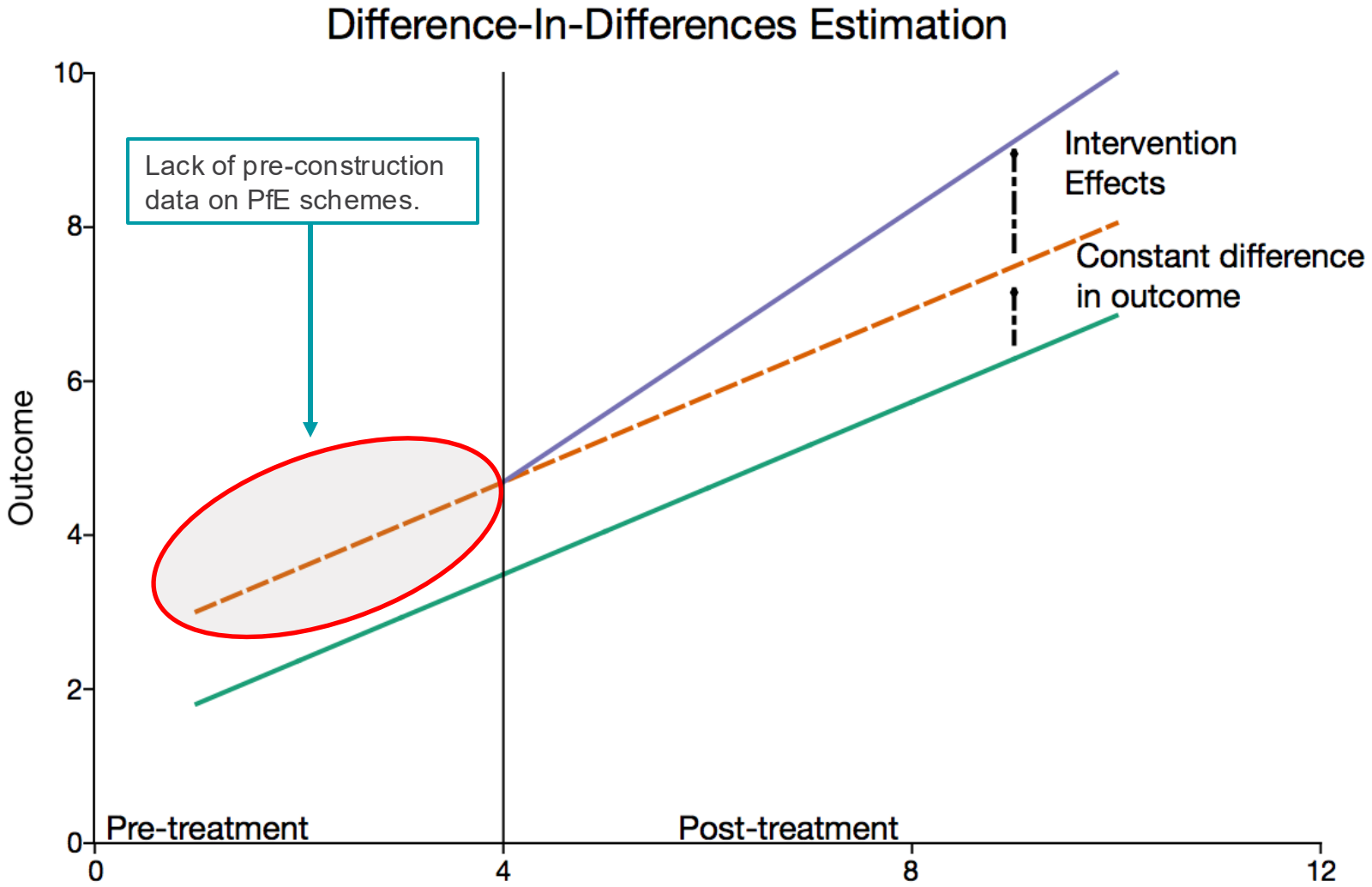

Difference-In-Differences Estimation
Outcome
10
8
6
4
2
0
Intervention
Effects
Constant difference
in outcome
Pre-treatment
Post-treatment
0
4
8
12


Difference-In-Differences Estimation
Lack of pre-construction data on PfE schemes.
Intervention Effects
Constant difference in outcome
Outcome
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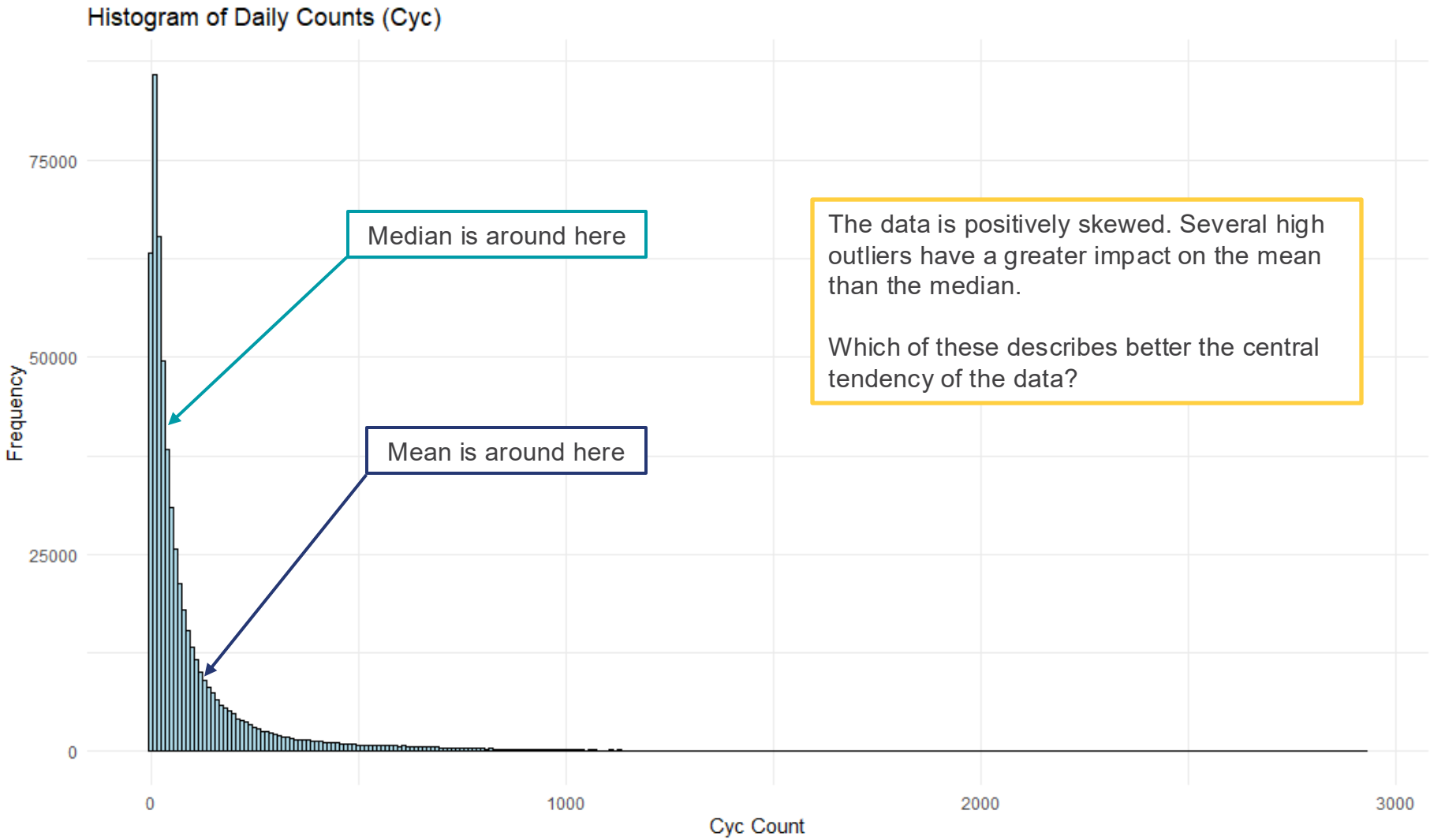

The data is positively skewed. Several high outliers have a greater impact on the mean than the median.

Which of these describes better the central tendency of the data?