



## Purpose

Estimate the care-associated carbon footprint for an early childhood dental visit

The primary objective of this study was to describe the environmental impact of travel and nitrous oxide gas emissions associated with early childhood caries (ECC).

## Methods

Retrospective Epic® Chart Review 2019-2021

Children ≤6 years old were included

**Exposure group** (n=3630 children, 4438 visits): children with an ECC dental treatment visit in the dental chair

**Control group** (n=2137 children, 2789 visits): children with only diagnostic and preventative services

### Outcome measures:

- Estimated distance traveled using census block units (miles)
- Nitrous oxide use (yes/no, duration, % administered)

Nitrous oxide and travel distance data converted to carbon equivalents

Nitrous oxide use triples the environmental impact of a dental treatment visit.

On average, children receiving treatment for ECC with nitrous oxide contributed 35.5 kgCO<sub>2</sub>e per visit.

## Travel Emissions

Two-way distance traveled per visit:

**Miles driven:** (median, IQR)

- Control: 18.6 mi (18.7)
- Exposure: 21.6 mi (43.6)

**Carbon Equivalents:**

- Control: 7.5 kgCO<sub>2</sub>e
- **Exposure: 8.7 kgCO<sub>2</sub>e**

## Results

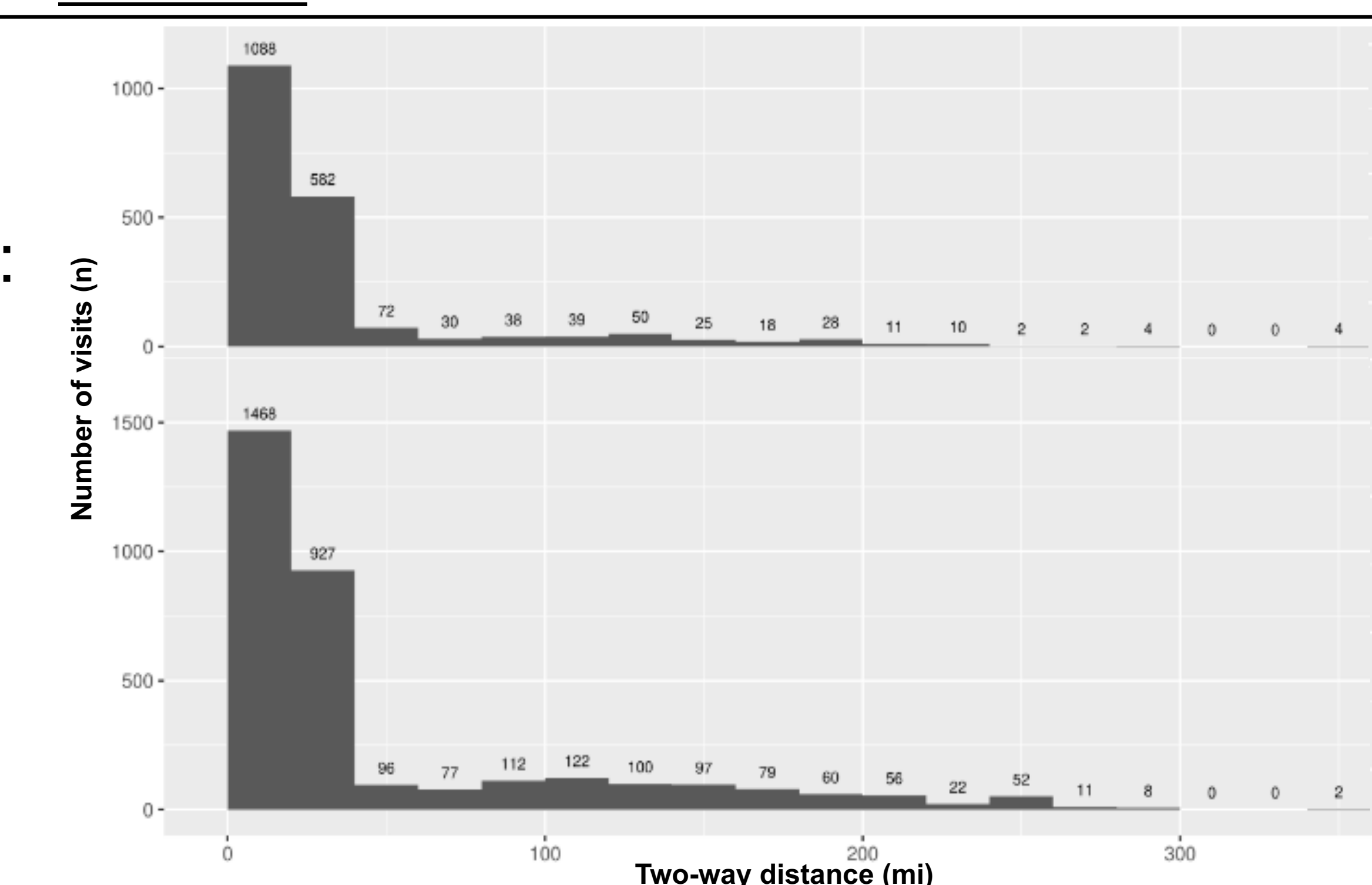


Figure 1. Two-way travel distance (in miles) at first visit for control group (top) and exposure group (bottom).

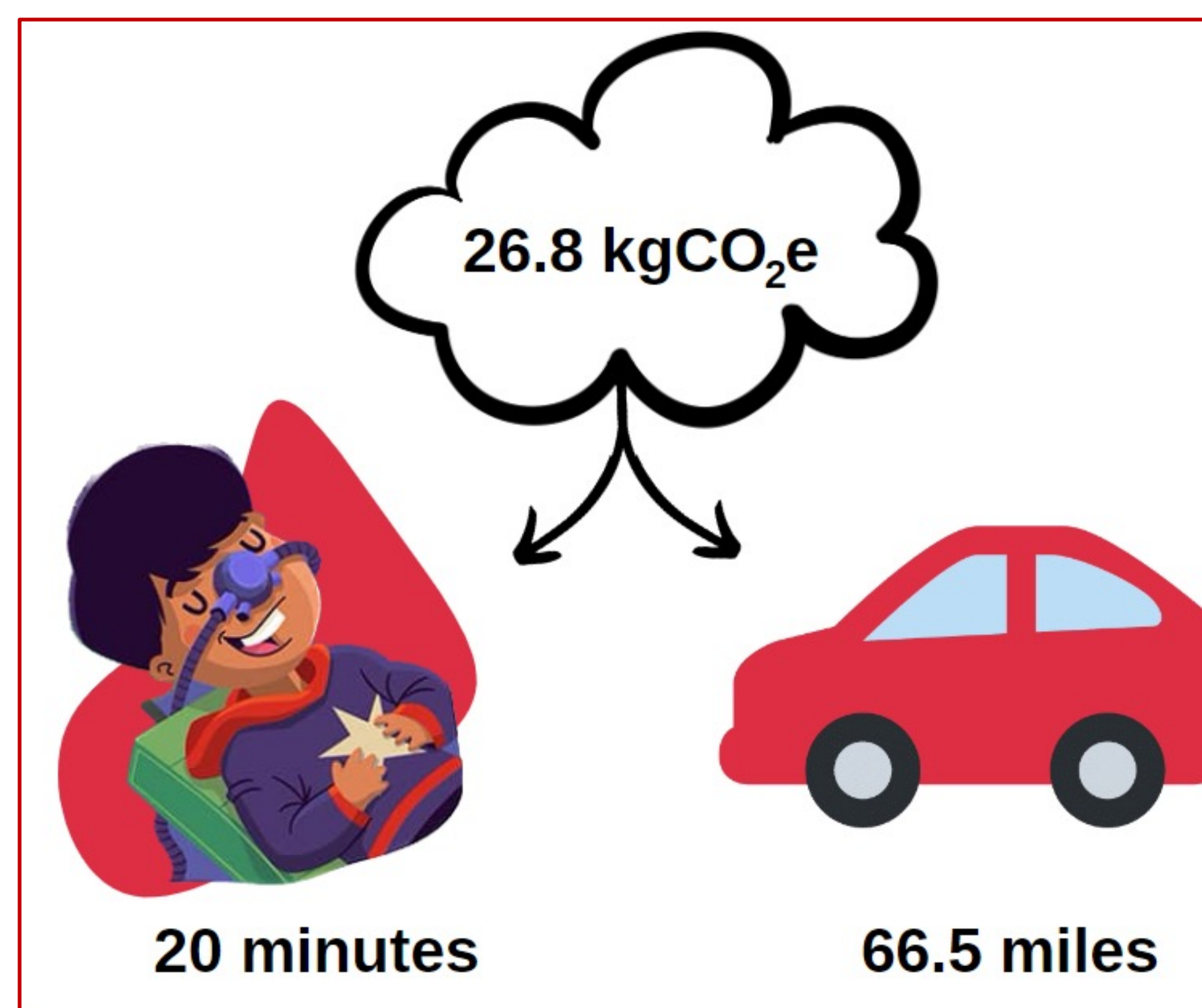


Figure 2. Carbon equivalent comparing 20 minutes of nitrous oxide at 50% concentration to travel distance by car.

## Nitrous Oxide Emissions

8.6% (n=380) of exposure patients received nitrous oxide for their visits

- Median duration: 20 min at 5L/min
- Median concentration: 50%
- **Carbon equivalent: 26.8 kgCO<sub>2</sub>e**

## Average Carbon Equivalent Summary (per patient):

- Control: 9.8 kgCO<sub>2</sub>e
- Exposure: 13.4 kgCO<sub>2</sub>e

## Acknowledgements

The authors would like to acknowledge Jodee McDaniel, Tyler Gorham, Youssouf Fall, and Jin Peng, for their support on this project.



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