Cost-effectiveness of Telemedicine: An analysis of telehealth visits in New York State from March 2020 to March 2021

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During COVID-19 in New York (March 2020-2021), **telemedicine** usage surged, reducing travel by an average **13.4 miles** per visit, **saving time and the environment**.

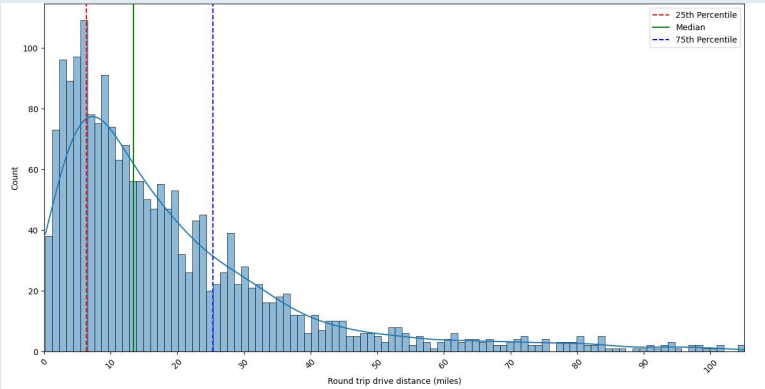

Figure 1. Round-trip distance from the patient's residence to the doctor's office

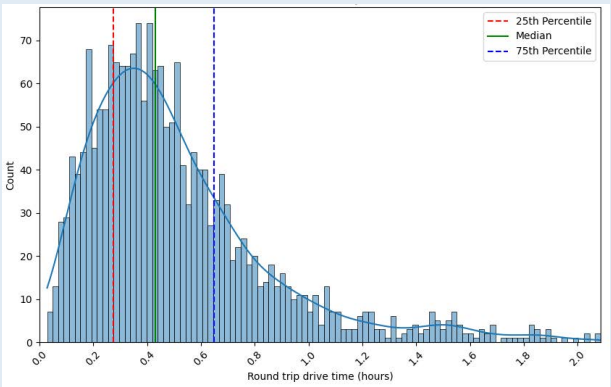

Figure 2. Round-trip drivetime from the patient's residence to the doctor's office

BACKGROUND

- Telemedicine utilization has increased since COVID-19.
- Previous research hints at potential cost savings, but empirical analysis is limited.[1]
- Aim: Quantify cost-utility and cost-effectiveness of telemedicine in Upstate New York.

METHODS

- **Data Source**: Random subset of 2,000 telehealth visits from 512,683 total visits from Rochetser Regional Health System.
- **Study Period**: March 2020 to March 2021.
- **Analysis**: R programming with Google API to calculate distance, time, and carbon savings.
- **Cost Estimation**:
  - Cost per mile based on US Department of Energy and IRS standard mileage rate.[2]
  - Time value based on New York State Minimum Wage.
  - Estimated cost = miles × $0.56 (IRS's standard mileage rate) + hours × $15 (hourly value based on New York State's Minimum Wage in 2021).[3]

RESULTS

- **Median Distance Saved**: ~13.39 miles.
- **Median Time Saved**: ~0.43 hours.
- **Gasoline Saving**: ~0.55 gallons/visit.
- **Cost Saving (IRS Mileage Rate)**: ~$13.95/visit.
- **Carbon Savings:** ~4.92 kg/visit.
- **Estimated annualized savings (for 512,683 total visits)**: ~8,957,607 miles, 239,126 hours, and $8,603,164; carbon saving of ~3,289,515 kg.
- **Environmental Impact**: Equivalent to the CO_2 removal by forests spanning between ~199.72 and 1,806.35 acres.[4]

DISCUSSION

- Telemedicine showcases significant cost-effectiveness in travel time, distance, and associated costs.
- Additional telemedicine benefits (e.g., decreased spread of infections, improved access for mobility-challenged patients) are beyond the scope of this study.
- **Limitations:** Results may not represent entire New York State; does not account for telemedicine implementation costs.

RESULTS (CONTINUED)

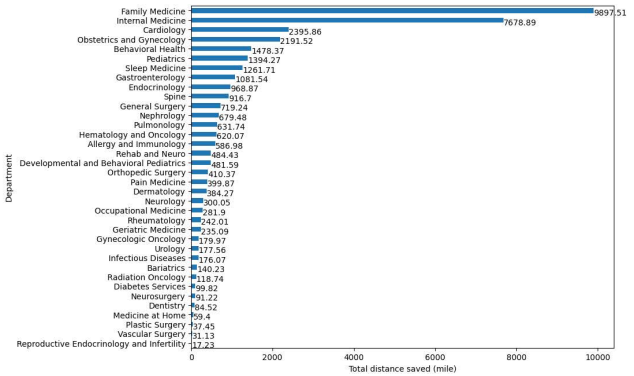

Figure 3. Total distance saved by department

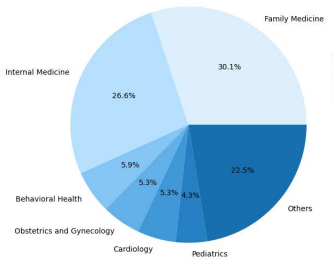

Figure 4. Telehealth visit departments

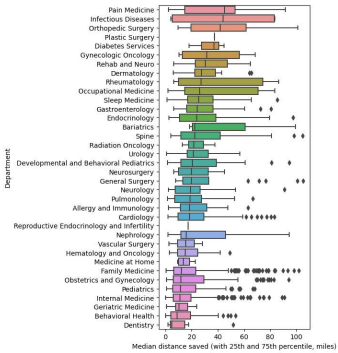

Figure 5. Distance saved per visit by department

CONCLUSION

- Telehealth in New York State from March 2020 - March 2021 underscores significant cost-utility and cost-effectiveness.
- Telehealth has the potential for vast savings in travel time, distance, cost, and environmental benefits.
- Broader adoption and further exploration of telemedicine can be of value.

REFERENCES

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