

# Understanding the Carbon Baseline on Patient Pathway's in Crisis and Neurodiverse Conditions in Children and Young People's Mental Health (NHS NET-ZERO Project)

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## BACKGROUND:

- The mental health of children and young people is a growing concern, with increasing rates of crisis situations and diagnoses of neurodiverse conditions such as Autism Spectrum Disorder (ASD) and Attention Deficit Hyperactivity Disorder (ADHD). These conditions require complex and often long-term care pathways, involving multiple interactions with healthcare providers, from initial diagnosis through to treatment and follow-up care.<sup>1</sup>
- As the healthcare sector seeks to improve service delivery and patient outcomes, there is also a pressing need to address the environmental impact of these services. The NHS has committed to achieving net zero carbon emissions by 2040, making it essential to understand the carbon footprint associated with different patient pathways.<sup>2</sup>

## Methods:

### Desk Research and Literature Review:

Reviewed existing studies on carbon emissions in healthcare and mental health services.  
Mapped out key patient pathways and identified emission hotspots.

### Mapping of Patient Pathways:

Detailed the journey from diagnosis to treatment and follow-up.  
Focused on interactions with GP, specialists, and emergency services.

### Carbon Footprint Calculation:

Collected data on energy use, transportation, and diagnostic procedures.  
Used carbon calculators to estimate emissions at each pathway stage.

### Extrapolation to Borough/Region Level:

Scaled individual patient emissions to estimate total regional impact.  
Used regional health statistics from North-West London to determine patient volumes.

## AIM:

To evaluate and reduce the carbon footprint of patient pathways in crisis and neurodiverse mental health conditions among children and young people by analysing each stage of care and providing sustainable recommendations for healthcare providers.

## Limitations:

### Data Accuracy:

- Estimates are based on available data and standard assumptions, which may not fully capture regional or facility-specific variations.

### Technological Variations:

- Differences in healthcare practices, such as the use of telemedicine and prescription methods, could impact the carbon footprint but are not fully accounted for.

### Behavioural Assumptions:

- Standard assumptions for patient travel and staff practices may not reflect actual behaviours, leading to potential discrepancies in the estimated emissions.

### Regional Differences:

- Carbon emissions can vary based on regional factors like public transport availability and local energy sources, which may limit the applicability of findings across different areas.

## Results

### Initial assessment

- In school/Nursery: 7 kg CO<sub>2</sub>e per assessment
- Home Visits by Teachers/Nursery Staff: 3 kg CO<sub>2</sub>e per visit
- Home Visits by Under-5's Health Visitors: ~3 kg CO<sub>2</sub>e per visit

### Diagnosis

- 2x GP consultations (19.8 kgCO<sub>2</sub>e) + 1 paediatric outpatient appointment (22kg)+ 0.5 (patient return journey)
- Autism questionnaire/ CAMHS assessment (14kg)=56.3

### Management

- Medication (16kg (per prescription) + (CM: Intervention Teams) 14kg+(CM: STT)
- 7KG (Staff collecting fp10 forms (3kg) Parents collecting prescription (20.4)

### Monitoring and Follow Up

- 2x GP consultations (19.8 kgCO<sub>2</sub>e) + 1 paediatric outpatient appointment (22kg)+ 0.5 (patient return journey)=42.3
- (CM: STT) 7KG (Staff collecting fp10 forms (3kg) Parents collecting prescription (20.4)
- Paediatric emergency medicine travel (8.6) + Paediatric neurodisability service travel (5.1)

### A & E readmittance

- Emergency transport (56), intensive energy use in emergency department(13.8)
- Self travel to A&E per visit (1.13)

## Results:

- significant carbon emissions are associated with the management and monitoring stages of the patient pathway, largely due to the travel and ongoing treatments required. The emissions for the entire pathway total 287.03 kg CO<sub>2</sub>e.

## Further Work:

- Data Collection:** Track patient volumes and emissions at each stage of care.
- Pilot Programs:** Test telemedicine and sustainable practices in select facilities.
- Stakeholder Engagement:** Educate staff on sustainability and collaborate with environmental organizations.
- Policy Development:** Establish emission reduction targets and incentives for NHS facilities.

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<https://imperialcollegehealthpartners.com/>

## Conclusion:

To reduce the carbon footprint of mental health pathways for children and young people, focus on:

- Telemedicine:** Minimize travel emissions.
  - Energy Efficiency:** Upgrade to efficient equipment.
  - Sustainable Transport:** Use low-emission options.
  - Green Practices:** Implement waste reduction and recycling.
  - Training:** Educate staff on sustainability.
- These strategies will lower emissions and support effective, sustainable care.

## References:

- Scandurra V, Emberti Gialloreti L, Barbanera F, Scordo MR, Pierini A, Canitano R. Neurodevelopmental Disorders and Adaptive Functions: A Study of Children With Autism Spectrum Disorders (ASD) and/or Attention Deficit and Hyperactivity Disorder (ADHD). *Front Psychiatry*. 2019 Sep 4;10:673. doi: 10.3389/fpsy.2019.00673. PMID: 31551839; PMCID: PMC6737073.
- <https://www.england.nhs.uk/greenernhs/a-net-zero-nhs/>