

Quantifying the positive environmental impact of a virtual kidney clinic in East London

Dr Jessica Ann Dilliway¹, Dr Saurabh Chaudhri², Mr Jargi Topuria³, Dr Sally Hull⁴, Dr Gavin Dreyer²

¹*Barts Health NHS Trust, Acute Medicine, London, United Kingdom*, ²*Barts Health NHS Trust, Department of Renal Medicine, London, United Kingdom*, ³*Barts Health NHS Trust, Business Intelligence Unit, London, United Kingdom*, ⁴*Queen Mary University of London, Clinical Effectiveness Group, London, United Kingdom*

Introduction

The NHS produces higher emissions than the global average for healthcare services and is responsible for 5.4% of the UK's total carbon emissions. East London has a disproportionately high prevalence of CKD and ESKD with previous traditional models of care for CKD in East London based on multiple outpatient visits. The virtual CKD service in East London allows clinicians to manage the majority of patients in primary care with approximately only 10% of virtual referrals requiring a hospital visit. This model has the potential for a reduction in air pollution by reducing multiple trips by vehicle to hospital sites. Accordingly, we studied the potential positive impact on the environmental footprint of the NHS using a virtual clinic system for a high-volume clinical service.

Methods

The virtual CKD service has been operating since Dec 2015. We used routinely collected data from four inner London CCGs to identify individual post codes of patients referred to our service. Using geographic co-ordinates produced by the Office of National Statistics for each postcode, we calculated the great-circle distance to one of four London Hospitals (using the Haversine formula) which correspond to secondary care renal services for these CCGs. We applied a simple uplift to account for patients not travelling in a straight line between co-ordinates.

We assumed each virtual appointment equated to a standard outpatient visit and then for each postcode we multiplied distance to hospital by the total number of virtual appointments. We surveyed patients arriving to general nephrology clinics at two of the London Hospitals documenting the mode of transport used to travel to clinic. We applied this to work out the percentage of miles that would have been driven by both private transport (using national average 2018 CO₂ emissions of 141.9 g/km) and patient transport (assuming all patient transport used diesel vehicles based on the Sustainable Development Unit Health Outcomes Travel Tool) to estimate the carbon saving of a virtual clinic system.

Results

There have been 16,599 virtual appointments since the virtual CKD service began until November 2019, the majority (54.8%) of which were new appointments. In our survey of travel to two general nephrology outpatient clinics, 39% travelled by public transport, 8% by patient transport and 53% by car or taxi. We estimated a crude total travel distance of 64,049 miles across all four CCGs. We estimate 33,710 miles would have been travelled by private vehicle (equivalent to 7.7 tCO₂e saved) and 5,054 miles by patient transport (equivalent to 3 tCO₂e saved) representing a total potential saving of 10.7 tCO₂e saved over the duration of the vCKD clinic service. This is equivalent to 11.9 commercial flights between New York and London.

Conclusion

Climate change is a public health issue and will threaten human life and health care infrastructures around the world if it continues to occur. Expanding virtual clinics for suitable patients across a wide range of

settings and specialties has huge potential to deliver a reduction in carbon emissions associated with the NHS.