‘Green Eyes’
The carbon footprint of cataract surgery

DS Morris, T Wright, JEA Somner and A Connor
Cardiff Eye Unit, University Hospital of Wales, Cardiff, UK

Background
Climate change is predicted to be one of the largest global health threats of the 21st century. Healthcare itself is a large contributor to carbon emissions in the U.K and there is increasing pressure on the NHS to reduce its carbon footprint, as well as reducing costs. Determining the carbon footprint of specific health care activities such as cataract surgery permits the assessment of associated emissions and identifies opportunities for reduction.


*

Aim
To assess the carbon footprint of a cataract pathway in a British teaching hospital and to highlight potential areas whereby the carbon footprint could be reduced. To provide a model for quantifying carbon emissions associated with cataract surgery so that comparisons to any future changes in service provision can be made.

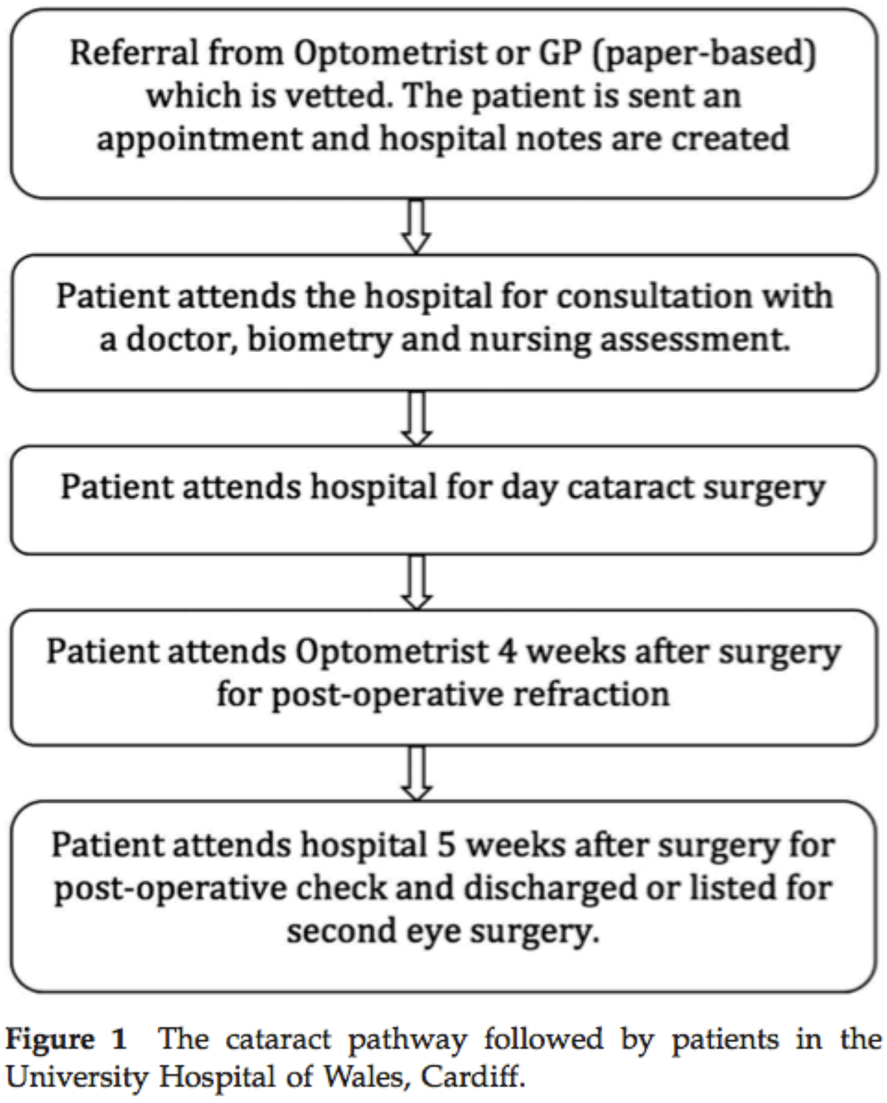

Figure 1 The cataract pathway followed by patients in the University Hospital of Wales, Cardiff.

Methods
This was a component analysis study for one patient having first eye cataract surgery in the University Hospital of Wales, Cardiff. Activity data was collected from three sectors; building and energy use, travel and procurement over a series of weeks. This was collected from a combination of audit data, finance information and other pre-determined algorithms. Published emissions factors were applied to this data to provide figures in carbon dioxide equivalents (CO2eq).

Outcomes
The carbon footprint for one cataract operation was 181.8 kg CO2eq. On the basis that 2230 patients were treated for cataracts during 2011 in Cardiff, this has an associated carbon footprint of 405.4 tonnes CO2eq. Building and energy use was estimated to account for 36.1% of overall emissions, travel 10.1% and procurement 53.8%, with medical equipment accounting for the most emissions at 32.6%. Extrapolating from our results, with 343 782 lens extractions undertaken in 2011, this equates to 63,000 tonnes of CO_2eq. To put this in perspective, the typical carbon footprint of a UK resident is estimated to generate 10 tonnes CO_2eq per year and a flight to New York 2 tonnes CO_2eq.

Discussion
This is the first published carbon footprint of cataract surgery and acts as a benchmark for other studies as well as identifying areas for emissions reduction. While carbon reduction strategies outside of the health care sector often focus upon the emissions arising from building energy use and travel, such strategies, although valuable, will prove insufficient to meet the targets set by the NHS Carbon Reduction Strategy. Instead, attempts to reduce GHG emissions arising within the health care setting must also target procurement emissions by working with industry partners to achieve carbon reduction. One example highlighted in this study would be to alter the packaging associated with cataract lenses. Since cataract surgery is such a common procedure throughout the world, sustainability should be considered when pathways are designed as there is potential for carbon footprint reduction in all sectors with the possible side effects of saving costs and improving patient care.

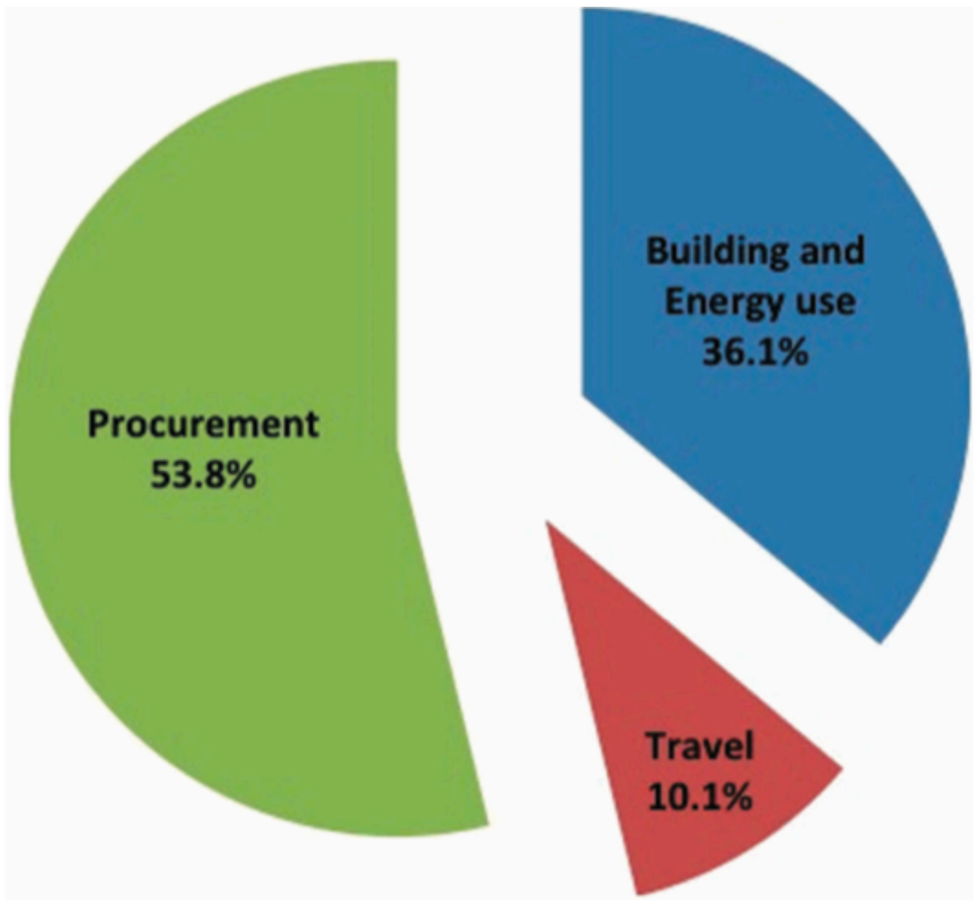

Figure 2 The carbon footprint of a patient undergoing first eye cataract surgery divided into primary sectors of GHG emissions.

References
Morris DS., Wright T., Somner JEA. and Connor A, 2013, The carbon footprint of cataract surgery, *Eye*, Apr;27(4):495-501
*Taken from picturecollections.com accessed on 15/07/2013.