

THE CARBON COST OF CLARITY: BENCHMARKING SUSTAINABILITY IN WESTERN VS ASIAN MODELS



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Introduction

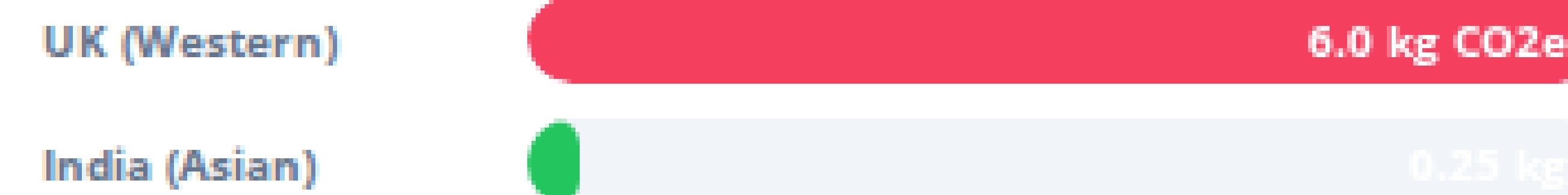
Operating rooms produce high waste and emissions. Western systems rely on single-use disposables, while Asian high-volume centers (e.g. Aravind) utilize safe reusable instrumentation.

Objective

Compare carbon footprint (kg CO₂e) and solid waste per cataract case. Meta-analysis of 11 studies including UK models vs Aravind (India).

Environmental Metrics

Carbon footprint per Phacoemulsification:



Solid Waste: 2.3kg (West) vs 0.25kg (Asia) per case.

Safety: Endophthalmitis

No statistically significant difference in infection rates between high-waste and low-waste protocols:

0.01% - 0.04%

INFECTION RATE
RANGE

Conclusion: "Frugal innovation" achieves clinical parity with 1/24th the carbon cost. Barriers to instrument reuse must be reconsidered.

