The Financial and Environmental Costs of Reusable and Single-use Plastic Anaesthetic Drug Trays

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There is increasing interest in the environmental effects of healthcare which are responsible for approximately 3% of all carbon dioxide (CO2) emissions in the UK. We modelled the financial and environmental costs of two commonly used anaesthetic plastic drug trays. We proposed that, compared with single-use trays, reusable trays are: less expensive, consume less water, and produce less carbon dioxide (CO2); and that routinely adding cotton and paper increases financial and environmental costs.

Methods: We used life cycle assessment (LCA) to model the financial and environmental costs of reusable and single use trays. In brief, an LCA has inputs (such as the CO2 emissions and water use for electricity from brown coal) which are combined to form a process (such as the CO2 emissions and water use for making plastic trays).

Results: From our LCA modelling, the reusable tray cost (Australian dollars) $0.23 (95% CI: $0.21 to $0.25) while the single-use tray alone cost $0.47 (price range of $0.42 to $0.52) and the single-use tray with cotton and gauze added was $0.90 (no price range in Melbourne, Australia). Production of CO2 was 110g CO2 (95% CI: 98g to 122g CO2) for the reusable tray, 126g (95% CI: 104g to 151g) for single-use trays alone (mean difference of 16g, 95% CI: -8g to 40g) and 204g CO2 (95% CI: 166g to 268 gCO2) for the single-use trays with cotton and paper. Water use was 3.1L (95% CI: 2.5L to 3.7L) for the reusable tray, 10.4L (95% CI: 8.2L to 12.7L) for the single-use tray and 26.7L (95% CI: 20.5L to 35.4L) for the single-use tray with cotton and paper.

Conclusion: Compared with reusable plastic trays, single-use trays alone cost twice as much, produced 15% more CO2, and consumed three times the water. Packaging cotton gauze and paper with single-use trays markedly increased the financial, energy and water costs. On both financial and environmental grounds it appears difficult to justify the use of single-use drug trays.