

Researchers investigate how vial sizes can be optimized to reduce pharmaceutical wastage

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Pharmaceuticals are often dosed according to patient weight or body size which means that a dose must be individually measured. In a new study, lead author Anthony Hatswell of Delta Hat Limited and University College London in the UK, shows that by optimizing drug dose sizes available, wastage can be cut by as much as 50 per cent. The research is in the Adis journal *Applied Health Economics and Health Policy*, which is published by Springer Nature.

Many pharmaceuticals, such as drugs used for [cancer treatment](#), are only available in standard quantities, for example in 100 milligram packages. In this study, Hatswell and his co-author Joshua Porter investigated how the quantity of medicine in each package could be varied to reduce the overall wastage. This would allow manufacturers to cut their costs, helping to make medicines available to patients.

To calculate the level of wastage, the authors looked at statistics from the Health Survey for England, which gives data on the height and weight of over 5000 individuals. Using this data they calculated how much drug would be wasted at every combination of vial sizes. The analysis was then tailored to the characteristics of patients with the disease (for example, males are heavier and taller than females on average), before the total wastage was aggregated over the population. By looking at all possible combinations of package sizes, Hatswell and Porter were then able to find those with low levels of wastage. The steps laid out in the publication can therefore be applied to any drug that does not have a fixed dose.

The researchers found that wastage from the cancer drug pembrolizumab (Keytruda, Merck, which is on track for sales of more than \$5 billion in 2018) could be cut from 13.3 per cent to 8.7 per cent. Similarly the prostate cancer drug cabazitaxel (Jevtana, Sanofi) could see wastage cut from a projected 19.4 per cent to 6.5 per cent.

" We use methods such as integer programming and [operations research](#) which date back to the Second World War and are widely used in the manufacturing of consumer goods. Their application to healthcare represents a novel step which ultimately we hope will help patients access important new medicines," explains Hatswell.

More information: Anthony J. Hatswell et al, Reducing Drug Wastage in Pharmaceuticals Dosed by Weight or Body Surface Areas by Optimising Vial Sizes, *Applied Health Economics and Health Policy* (2018). [DOI: 10.1007/s40258-018-0444-0](https://doi.org/10.1007/s40258-018-0444-0)

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