

LETTER

Lies, damned lies and graphs

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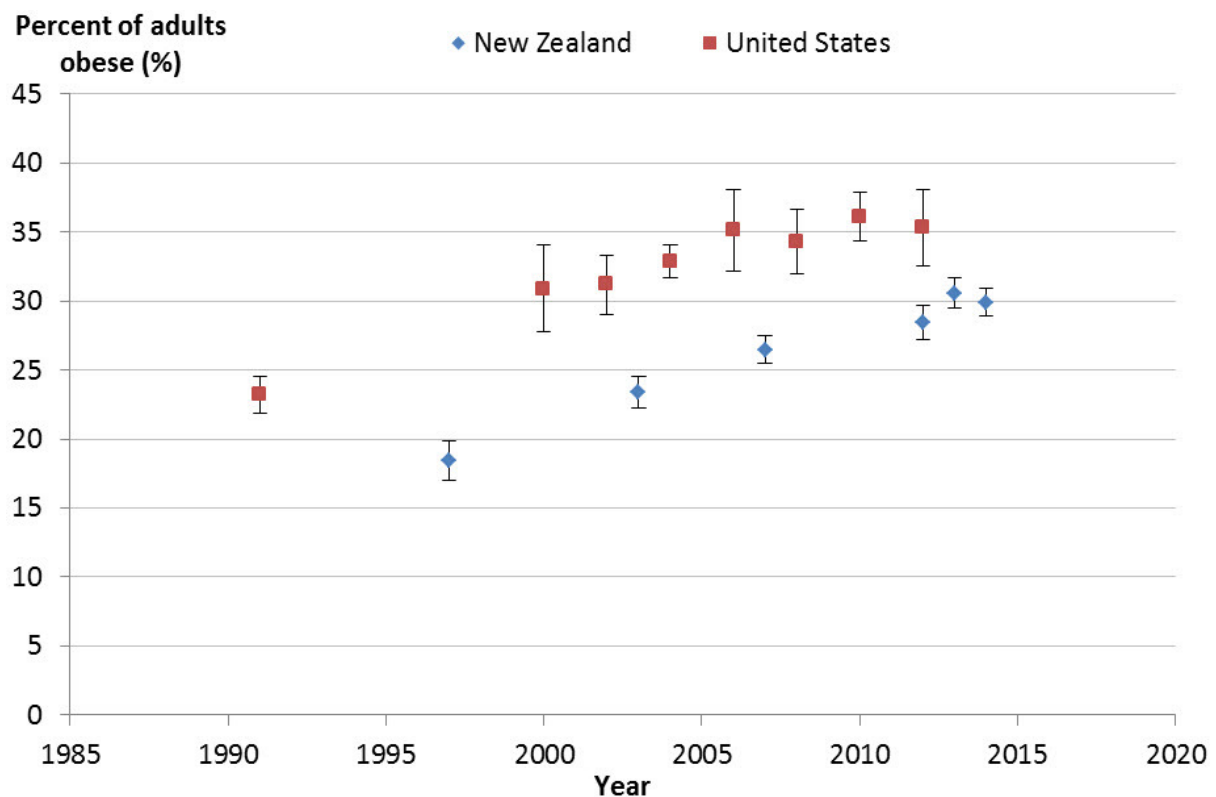
Dear Sir

The recent editorial by Kelly and Flint¹ is a classic that should be included in the next edition of the book 'How to Lie with Charts' by Gerald Everett Jones.² Their graph is an excellent teaching example of turning good data into misleading information. A first-year student would quickly identify the glaring errors.

A close look at the x-axis of their graph shows inconsistent year intervals of eight years (1989–1997), five years (1997–2002, 2002–2007, 2007–2012), one year (2012–2013), three years (2013–2016), and four years (2016–2020). The so-called projections of obesity rates compare two different models: a linear model for New Zealand and a log model of the USA using the different time intervals. It is also difficult to decipher the authors' statement 'that the rate of obesity in New Zealand rises by 1% each year' from the data presented in their paper.

Graphing the data correctly (Figure 1) still suggests an increase in the obesity rate, but not the same dramatic increase suggested by Kelly and Flint. The correct graph provides less support for the authors' proposition that in 5 years the New Zealand rate will exceed the rate in the USA.

Figure 1. National adult obesity prevalence trends, New Zealand and USA



Notes: 95% confidence intervals included on data points. New Zealand data is from comparable and consistent surveys.

Sources: 1997 New Zealand National Nutrition Survey, New Zealand Health Survey (2002/03, 2006/07, 2011/12, 2012/13, 2013/14)^{3,4}; NHANES data⁵; OECD Health Statistics 2014.⁶

<http://www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2015/vol-128-no-1410/6464>

While the authors have nobly promoted the need for increasing bariatric operations, their message is severely compromised by the inclusion of misleading and inappropriate data. Undoubtedly, obesity is, and will continue to be, a major public health issue in New Zealand.

Kelly and Flint have done a major disservice to those involved in developing prevention strategies by the lack of rigor in the presentation of data. It is a prime example of producing unreliable facts from reliable data.

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Response from Kelly and Flint

This is our reply to the questions about the diagram.

The x-axis data values are not linear as the data points are projected directly on the graph. However this does not affect the statistical modelling, it only reflects the graphical projection. Your graph projects both New Zealand and USA obesity rates versus time as being linear. This is true for New Zealand, as it has linearly increasing obesity rates of 1% every year since 1989. However it is a fact that the USA has had a stable obesity rate for the last 10 years as published by Cynthia Ogden from the CDC¹ and also published by the OECD.² Therefore USA has a logarithmic trend line as depicted on the editorial paper.

From a simplistic standpoint if New Zealand is currently 30% obese and increases by 1% per year, and USA is currently 35% obese and stable, then it will take 5 years until NZ will then become most obese.

No-one knows if or when New Zealand's obesity rates will start to plateau particularly with a government that is doing little to address the problem. If the rate however does start to plateau we will not know this for another 5 years.

More importantly the point behind the editorial was not to debate details of future obesity predictions. It was to raise awareness of the single biggest health threat to New Zealand which is currently not being addressed.

<http://www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2015/vol-128-no-1410/6464>

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