Luke and Cooper put forward a compelling case that changes in physical activity (PA) have been a minor driver, at best, in the rise of obesity and that they are likely to be no more than a minor part of the solution for obesity. This conclusion has profound implications for public health, so the case needs to be carefully scrutinized and then the boundaries of the logical imperatives which flow from this conclusion need to be explored. The caveat that Luke and Cooper make clear is that PA has many positive, health-promoting benefits and even in the absence of a significant effect on obesity, it should be promoted and supportive environments for PA should be enhanced. I fully endorse that position.

‘Does physical activity influence obesity?’ is not a useful question because it is not specific enough and different studies can answer different aspects of that question. ‘How much have reductions in PA contributed to increases in obesity prevalence over time?’ – the answer appears to be ‘very little’. Although the caveat is that most studies have been conducted in high-income countries, whereas in rapid transition countries like China, which have had clear reductions in occupational PA and active transport, the answer may be ‘some’. Does PA have more explanatory power than diet in answering the question ‘What explains differences in obesity prevalence?’ It seems intuitive that the lower obesity prevalence in the cycling-oriented Netherlands compared with car-oriented England, or in occupationally active rural India compared with occupationally sedentary urban India, may be due to higher PA and energy expenditure levels. However, meta-analyses of doubly-labelled water studies show that populations in wealthier, heavier countries have higher total energy expenditures (due to their larger body sizes and resting metabolic rates). The same apparent paradox of high body weight associated with high total energy expenditure is seen in individuals within a population. Even the question ‘Does a PA intervention reduce weight?’ is largely answered in the negative, although failure of PA itself compared with the failure of PA programmes (through non-adherence) to reduce weight is always a challenge to disentangle.
Resoundingly, the consensus is building that to reverse the obesity epidemic the focus must be on food and the ‘push effect’ of the food supply. The ‘flipping point’ concept\(^4\) proposes that as food has become more globalized, processed, affordable, energy-dense and heavily marketed from about the 1970s, more populations are ‘passively over-consuming’ calories, and the main mechanism for achieving return to energy balance (albeit at higher energy intake and expenditure) is through weight gain.

These conclusions have major implications for reframing the determinants and solutions for the obesity epidemic.

**Reframing the proximal drivers and behavioural solutions**

The behavioural determinants should be framed predominantly in terms of energy overconsumption – albeit as a normal human response to the increasingly obesogenic food environment. Thus, in health promotion programmes and social marketing messages, food and PA do not warrant equal billing – they should be much more heavily weighted to food. And even within food, there needs to be shift towards promoting more of the ‘eat less’ (unhealthy food) than the ‘eat more’ (healthy food) messages.\(^5\) People’s dietary intakes are not like a pipe where putting more fruit and vegetables in one end causes junk foods to fall out the other end. The shift from the soft to the hard-hitting messages increased the effectiveness of quit smoking campaigns in the 1990s, and the start of a similar shift may just be occurring for healthy eating messages with New York City leading the way. Obesity prevention programmes which are dominated by PA promotion should be considered as non-evidence based and untoward food industry influence on deciding the strategy mix should be looked for.

**Reframing the distal drivers and structural solutions**

Corporations operate within a legal and economic structure which society has constructed for them. They are just doing the job that we ask of them – make profits and obey the laws. However, in doing their job so well, they have created a number of detriments of which the obesity pandemic is but one. These legal and economic structures have unfortunately created enormous inequalities of power, wealth and health and social outcomes. And now the power of the rich countries and corporations is maintaining or increasing these inequalities. Unfortunately, these determinants have been lumped together under the term ‘social determinants of health’\(^10\) which implies that people collectively are the problem. A framing like ‘structural and corporate determinants of health’ may better convey the sense that the problem is both in the structures (especially the legal and economic architecture that shapes the environments that people live in and businesses they work in) and the unbalanced power of corporations in influencing public policy. The narrow focus on economic growth as the Holy Grail of prosperity, long after it has reached the point of diminishing returns for wealthy nations, needs to be broadened to include indicators of environmental and social prosperity (including health). Democratic institutions need to be strengthened to redress the power imbalance which currently favours corporations, and the dysfunctional capitalism of oligopolies, externalized costs, lack of transparency and tolerated market failures need to be returned to the constrained and beneficial capitalism as it was originally envisaged. The private sector needs to be legally required to create more than just profit for its shareholders – protecting, not exploiting, society, environments and even public health needs to be included within its accountabilities.
The extrapolation from the lack of evidence that changes in PA are an important behavioural driver of the global obesity epidemic to the need for fundamental economic, democratic and legal reform seems like a long and untenable bow to draw. But join the dots and see the deep connections driving the relentless march of obesity, climate change, resource depletion and loss of democracy.11

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References

Commentary: Physical activity and weight control

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Luke and Cooper1 titled their paper ‘Physical activity does not influence obesity risk: time to clarify the public health message’. Rather than dwell on refuting each point made by the authors, we want to comment on the intent of the paper.

Food and physical activity both affect body weight

It is difficult to believe that two accomplished researchers really do not understand the first law of thermodynamics or they are not aware of decades of exercise science showing the impact of physical activity on all components of energy balance and on every aspect of human physiology. This is not a literature review but rather a personal opinion stated with sweeping claims supported by a few selective references. For example, they failed to cite studies of bed rest showing that reductions in physical activity can lead to rapid metabolic changes favouring accumulation of body fat.2 They mention neural control of food intake but fail to cite many studies showing that exercise can have important effects on how the brain regulates energy balance.3 Many studies they cite for the lack of impact of physical activity actually