Estimating the health economic benefits of physical activity for people with limited mobility in the UK

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INTRODUCTION

Disability refers to long-term conditions, including physical, mental, intellectual, and sensory impairments, which in interaction with various barriers might hinder someone's full and effective participation in society on an equal basis with others. In the UK, an estimated 24% of the population have a disability, and this figure represents a 5% increase in the prevalence of disabilities since 2011. The term "disability" covers a broad range of impairments; the most common types of impairment in the UK relate to mobility (47%), stamina/breathing/fatigue (35%), and mental health (32%).

Disabled people have worse social, health, and economic outcomes compared with non-disabled people. Their health outcomes are more likely to result in lower levels of wellbeing for happiness, worthwhile, life satisfaction, and higher levels of anxiety. Furthermore, people with disabilities have been shown to have higher levels of obesity, smoking, and cardiovascular disease.

In adults with physical or cognitive disabilities, studies have suggested there are health benefits resulting from physical activity in terms of cardiorespiratory fitness, muscular strength, psychological wellbeing, and functional skills. Furthermore, no evidence suggests that it is unsafe for disabled people if it is performed to an appropriate level for the person's condition. For disabled children and young people, a review found that the positive health benefits and safety of physical activity likely extend to this population too.

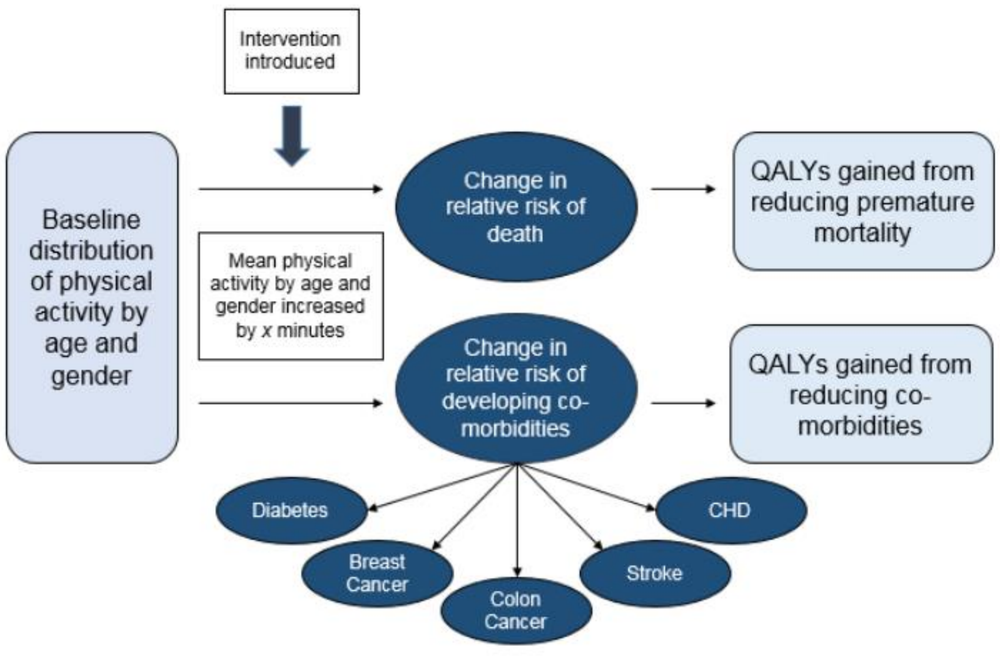
The wider economic benefits of increasing physical activity to the general population have been demonstrated on numerous occasions . There is less evidence on the economic benefits of physical activity for disabled populations or people with lower mobility, yet there could be greater benefits to be achieved in this area.

This study aimed to estimate the health economic impact associated with different levels of increases in physical activity for people with limited mobility.

METHODS

To estimate the costs and outcomes associated with different hypothetical interventions, a cohort-based Markov model, using weekly metabolic equivalent time (MET) was used to predict the likelihood of developing different health conditions. The model was based on a previously-published model (see QR link below for the full report). The model can estimate the benefits of any intervention that changes the average MET for any group of people. It was developed in line with the NICE methods manual and adopts an NHS and personal social services (PSS) perspective. It allows for various time horizons to be reported, including a lifetime time horizon which captures all relevant costs and benefits. The model structure is shown in Figure 1.

Figure 1: Model structure



Note: CHD = coronary heart disease; QALY = quality-adjusted life year.

METHODS (cont.)

The pre- and post-intervention MET minutes for each subgroup are then plugged in to risk functions relating MET minutes per week with (i) mortality and (ii) five comorbidities linked to physical activity levels. From this we obtain the relative risk of death and disease from introducing the intervention for each age and gender subgroup. The five comorbidities included in the model were chosen from the literature due to showing the clearest link with physical activity levels.

Physical activity distributions were calculated for those with limited mobility using data from the 2014 Health Survey for England, where limited mobility was defined as having either 'Some problems in walking about' or 'Confined to bed' on the mobility component of the EQ-5D questionnaire. The baseline estimate was based on a sample of 1,113 individuals.

Two hypothetical cohorts (one with baseline levels of activity, the other with increased activity due to an intervention) then progress through a simple Markov state-transition model, in which there are two states: alive or dead. In each annual cycle individuals have a probability of death and probabilities of developing each of the comorbidities, which are determined by the physical activity levels and risk functions noted above.

Costs are determined by two factors: the initial intervention cost and the numbers experiencing comorbidities, for whom a yearly cost is applied (based on 2023 prices). The lifetime health of the cohort is calculated by subtracting the expected quality-adjust life years (QALYs) lost due to experiencing disease from the expected QALYs experienced by those who are alive. The model is run for every year of age from 16 to 100 and then weighted by the relative population density and used to create weighted average estimates.

RESULTS AND CONCLUSIONS

Figure 2: Maximum cost to be cost effective

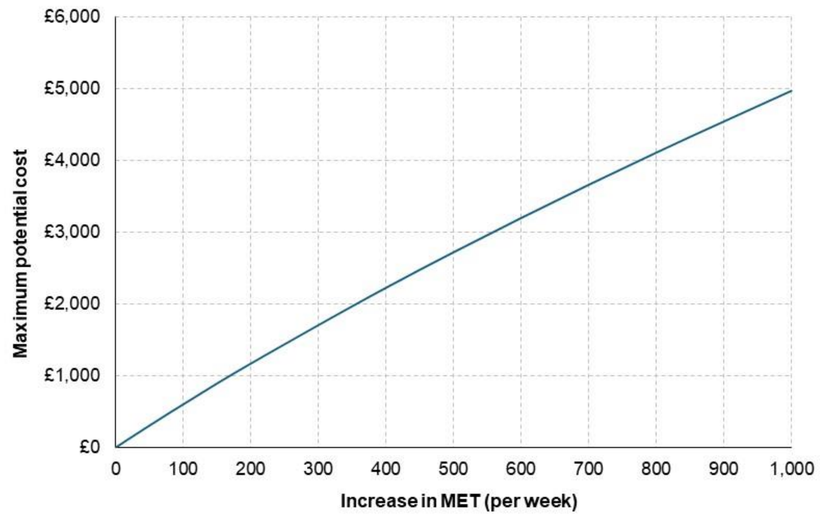


Figure 2, above, clearly shows that there are substantial health economic benefits to increasing physical activity (as measured by metabolic equivalent time) in a population with limited mobility. Even modest increases, such as +100 MET per week (equivalent to around 50 minutes of gentle gardening, or 15 minutes of jog/walk combination) can have large health benefits worth approximately £600. This means that an intervention that costs less than £600 would be considered cost effective if it increases physical activity by at least 100 MET per week. An intervention costing £100 per person would only need to deliver an average gain of 17 MET per week.

Interventions to promote and enable physical activity in people with disability or limited mobility are highly likely to be a cost-effective use of public resources

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