

# Reallocating time between sleep, sedentary and active behaviours

9 May 2018, by Rachel Colley



Today's post comes from Rachel Colley (Senior Research Analyst in the Health Analysis Division at Statistics Canada), and describes a new paper released on April 18, 2018 looking at how time reallocations among sedentary behaviour, sleep, light-intensity movement and exercise are associated with health. The full article is available for free [here](#). A brief summary of the article is also available [here](#). This article has also been posted by the Sedentary Behaviour Research Network.

Exercise, adequate sleep and limited sedentary [behaviour](#) are all important health-promoting behaviours.<sup>1-3</sup> Light-intensity movement is emerging as an independent predictor of improved cardiovascular health.<sup>4,5</sup> The majority of the research linking these behaviours to health has looked at them in isolation, but interest has increased in examining these movement behaviours collectively.<sup>6,7</sup>

Our day is a fixed 24 hours that is generally made up of sleeping, sedentary behaviour, light-intensity movement, and exercise. By increasing time in any one of these types of behaviours, something else has to decrease. As highlighted by Rania Mekary and colleagues, "the benefits of different activities

depend not only on the specific activity, but also on the activity it displaces."<sup>8</sup>

Isotemporal substitution is a statistical technique that allows associations between increasing a given movement intensity and a health outcome to be estimated while considering the type of movement that is being replaced.

The goal of this study was to use isotemporal substitution to examine how reallocating time among various movement intensities was related to indicators of obesity and self-rated general and [mental health](#) in a nationally-representative sample of Canadian adults aged 18 to 79 years.

## What did we do?

We used data from four cycles of the Canadian Health Measures Survey (n = 10,621). Sedentary time (SED), light [physical activity](#) (LPA) and moderate-to-vigorous physical activity (MVPA) were measured using Actical accelerometers while sleep duration, general health and mental health were self-reported. Obesity ([body mass index](#) and waist circumference) were directly measured. The isotemporal substitution technique was used to estimate the effect of substituting 30 minutes of one movement intensity for another, while controlling for total time and covariates. Mekary and colleagues do an excellent job of summarizing the technique [here](#).

## What did we find?

- Reallocation of 30 minutes from SED, LPA or sleep to MVPA was associated with lower measures of obesity. The effect was greater for older and overweight/obese individuals.
- Reallocation of time from SED to LPA was associated with lower body mass index and waist circumference among people aged 50 to 79 and among those who were

overweight or obese.

- Reallocation of time from SED to any other movement behaviour (i.e., sleep, LPA, MVPA) was associated with a decreased odds of reporting poor or fair rather than excellent general health.
- Reallocation of time from SED to LPA or sleep, but not MVPA, was associated with decreased odds of reporting poor or fair rather than excellent mental health.

### What did this article add?

The current Canadian physical activity guideline for adults recommends that adults should accumulate 150 minutes of moderate-to-vigorous intensity aerobic physical activity per week, in bouts of 10 minutes or more.<sup>8</sup> This study confirms that MVPA is important for [health](#) but also suggests that some adults may benefit from messaging around the importance of simply reducing [sedentary time](#) and replacing it with light-intensity [movement](#). This is in line with findings from the recently released 2018 Physical Activity Guidelines Advisory Committee Scientific Report<sup>9</sup> which highlights the benefits of more modest doses and intensities of physical activity, particularly for individuals who are currently inactive.

**More information:** Biswas A, Oh PI, Faulkner GE, et al. Sedentary time and its association with risk for disease incidence, mortality, and hospitalization in adults: a systematic review and meta-analysis. *Annals of Internal Medicine* 2015; 162(2):123-132.

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