


# Stand Up Australia

## Sedentary behaviour in workers

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- Research into office-based, call centre and retail employee behaviours revealed that 77 percent of the working day is spent sitting.
  - Individuals who spend high amounts of time sitting at work also tend to spend high amounts of time sitting on non-work days.
  - Participants in the study perceived they had much higher levels of physical activity than they did when measured objectively.
  - Prolonged sitting time in the workplace is an adverse health risk.

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## What is sedentary behaviour?

**Sedentary behaviour (from the Latin *sedere* – ‘to sit’) is the term now used to describe activity for which energy expenditure is only marginally above resting levels and is typically characterised by sitting which can occur at work, in transit, at home and during leisure time. Hence, the terms ‘sitting time’ and ‘sedentary time’ are often used interchangeably – each referring to sedentary behaviour.**

### Sedentary lifestyles

A sedentary lifestyle (ie: undertaking none or insufficient amounts of health-enhancing physical activity) is considered to be a major contributor to adverse health outcomes such as type 2 diabetes, obesity and cardiovascular disease. Notwithstanding the poor participation in physical activity in leisure hours by Australians, the increasing pace of technological change in workplace environments has also meant that prolonged sitting has become a ubiquitous component of adults’ working lives.

Posture at work has long been recognised as potential occupational hazard<sup>1</sup> but research is now linking high amounts of sedentary time - or prolonged sitting - with premature mortality<sup>2</sup>, heart disease and diabetes<sup>3-9</sup>.

There is increasing recognition that sedentary time in office-based workplaces also needs to be considered as a potential adverse health risk and is distinct to the lack of physical activity outside work hours.

With increasing evidence of sedentary behaviour being linked to chronic disease, and known associations between chronic disease and reduced productivity through absenteeism and presenteeism, there is growing speculation that prolonged sitting is an important factor in workplace health and outcomes.

### Medibank and workplace health

Medibank Private has been researching workplace health for many years, examining the effects of health status on productivity and the economy. Medibank’s latest research, outlined in this report, investigates sitting time in various groups of working adults. It aims to characterise both sedentary and physical activity patterns in staff from different working environments – corporate/office based, retail, and call centre employees.

This landmark study, Stand Up Australia, is a national collaboration between the Baker IDI Heart and Diabetes Institute, the Cancer Prevention Research Centre at The University of Queensland and Medibank Private.

The data analysed on the following pages was collected using accelerometers, along with self-reporting of activity levels in Medibank Private and a partner organisation’s employees from three distinct workplace settings – office-based, retail and call centre.

# About the study

The study involved 131 Medibank Private and partner organisation employees, aged 18 years and over, who were ambulatory (i.e. not wheel-chair bound) and employed full-time within office-based, retail or call centre workplace settings. Participation was voluntary, with employees invited to participate in the study via internal email. In being a convenience sample, it is acknowledged that this participant group may have been more interested in health/healthy lifestyle than a random population sample.

The study was conducted over two separate visits during a 10 day target period.

## Visit 1

Participants were provided with an accelerometer (a small, non-invasive device used to record the time, duration and the intensity of physical activity duration and sitting time) and a diary to record work-times and sitting activities undertaken during their waking hours.

General demographic (age, sex, date of birth, job classification, living circumstances) information was obtained using an interview administered questionnaire. Height, weight and waist circumference were collected using standard protocols of assessment.

Accelerometer use and diary completion took place over seven consecutive days (five workdays and two non-work days).



## Visit 2

Participants returned their accelerometer and diary. Information on self-reported sitting and physical activity time (from past seven days) was collected using an interviewer-administered questionnaire. A take home questionnaire assessing perceptions towards strategies to reduce sedentary behaviour in the workplace was given to participants to complete in their own time.

The Stand Up Australia study is the first in Australia and internationally, to collect information from people in workplace settings using objectively measured accelerometer data, as well as self-reported data. The information collected by the study provides research findings on sedentary time, as a marker of time spent sitting, in addition to physical activity. Another ground-breaking contribution of this study is the measurement of data collected according to the different domains (work and non-work) in a person's day and different workplace settings.

# Key findings

Based on the objectively measured data (accelerometer), the findings of the Stand Up Australia study show that the majority of time spent at work is sedentary – 77 percent.

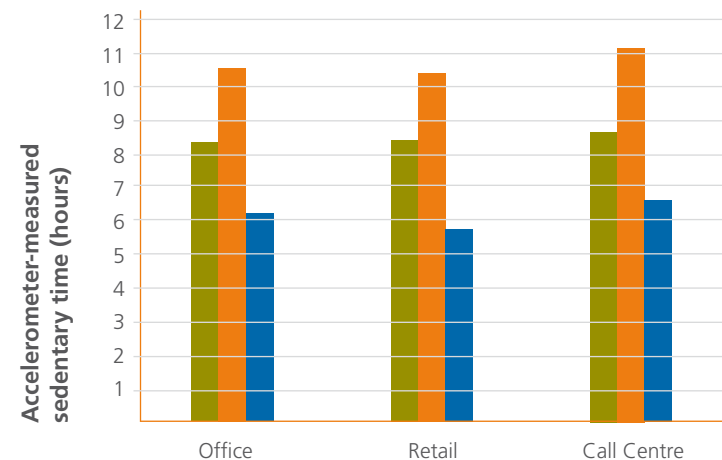
More broadly, 70 percent of the entire work day (before, during and after work) is spent sedentary compared to a non-work day in which the proportion is lower at 62 percent.

Moderate-to-vigorous intensity physical activity – the type of activity that forms the basis for current National Physical Activity Guidelines – occupied less than 5 percent of the time on both work days and non-work days. The remainder is occupied with light-intensity (incidental) physical activity.

Overall, significantly more time was spent in light-intensity activity on non-work days compared to work days, however, surprisingly, more moderate-to-vigorous intensity activity occurred on work days compared to non-work days.

While at work, call centre employees had the highest amount of sedentary time, engaged in less light-intensity activity, and took fewer breaks in sedentary time compared to office and retail employees.

**Chart 1: Objectively-measured sedentary time**



- Non-work Days (hrs/d)
- Work Days (hrs/d)
- Work Hours (FTE - 8hrs/d)

\* Data expressed as mean hours.

# Key findings

# Physical activity: objective vs self-reported measurements

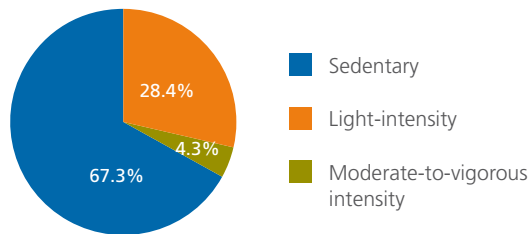
On non-work days there was very little difference in the moderate-to-vigorous activity levels between the three workplaces, and there was also minimal difference in the time spent sedentary.

There were significant workplace setting differences in time spent in light-intensity activity, particularly on work-days and during work hours. Retail employees spend more time doing light-intensity activity, and have more

breaks in sitting time than the other two groups, while call centre employees the least.

Overall, the majority of the day – 67 percent – (across both work days and non-work days) is spent sedentary. The remainder of the day is spent in light-intensity activity (28 percent) and only a small remaining percentage of the day (4 percent) spent in moderate-to-vigorous intensity activity.

**Chart 2: Accelerometer-measured activity across the entire sample population across all days**

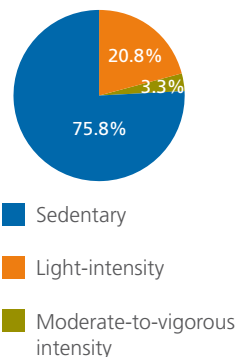


During working hours specifically, the dominance of sedentary time over time at other activity levels is even more pronounced, with

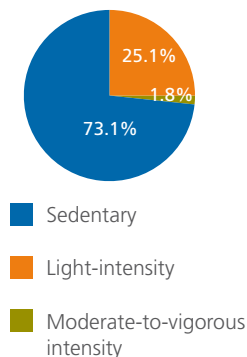
sedentary time comprising 82 percent of working time for call centre staff, 76 percent for office workers and 73 percent for retail staff.

**Chart 3: Accelerometer-measured activity during working hours**

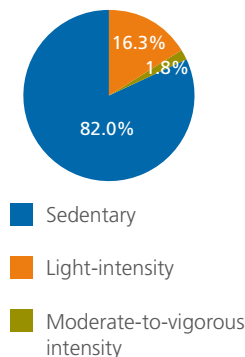
**Office workers**



**Retail workers**



**Call centre workers**



While the level of physical activity that is 'sufficient' to confer a health benefit has been debated for some time, it is currently recommended that Australian adults do at least 150 minutes of moderate-intensity physical activity each week (with brisk walking included as a moderate-intensity activity)<sup>10</sup>.

Existing self-report methods for assessing physical activity are subject to overestimation. This study reinforced this theory for moderate-to-vigorous activity and questions the utility of self-report data for gauging the extent to which National Physical Activity Guidelines are being achieved within the population.

Overall, self-reported physical activity exceeded what was recorded objectively using accelerometer data. Based on self-report data, two thirds of all participants reported they were achieving the minimum National Physical Activity Guidelines, whereas accelerometer data puts this estimate much lower at less than half.

Importantly, the objective measurements showed little difference in the amount of time doing moderate-to-vigorous intensity physical activity between workplace settings on non-work days.

Closer examination of the self-reported data shows significant differences between workplace groups in their perception of meeting the Guidelines. Whilst 75 percent of office employees believed they met the guidelines, the figure was lower in call centre workers (50 percent), and retail employees (44 percent). Objective measurement (with the accelerometers) supported this ratio during work hours, with office employees spending significantly more time in moderate-to-vigorous activity than employees at either retail or call centres.

Table 1 compares self-reported time spent in moderate-to-vigorous intensity physical activity with objective measures obtained via accelerometers. Whilst the average difference across all settings was relatively small, detailed comparison of the two measures showed a considerably wide variation for individuals in how well the self-report agrees with objective measures, and this variation is worse for participants who are more physically active.

Participants were much more likely to be classified as meeting the Guidelines via self-report than via objective measures.

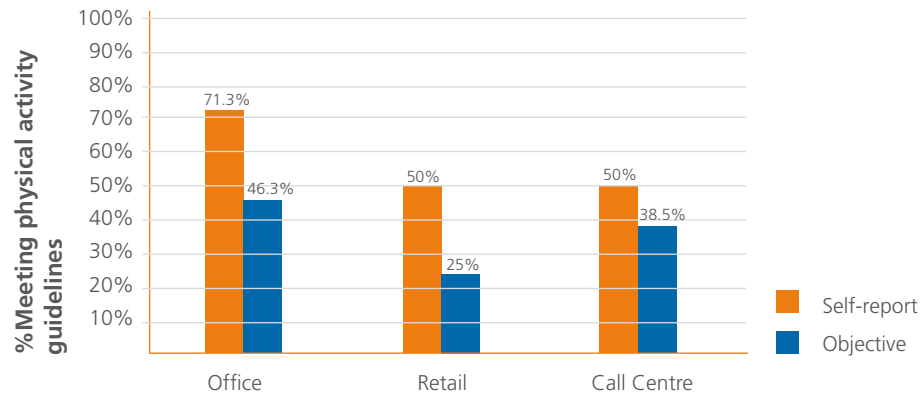
**Table 1: Self-report vs objectively measured moderate-to-vigorous intensity physical activity across all days**

	Self-report	Objective	Average Difference
Office (n= 62)	50.3	40.7	9.6
Retail (n=16)	34.5	29.7	4.7
Call centre (n=26)	26.0	36.7	-10.7
<b>All Settings</b>	<b>42.9</b>	<b>38.0</b>	<b>3.8</b>

\* Data expressed as mean number of minutes per day.

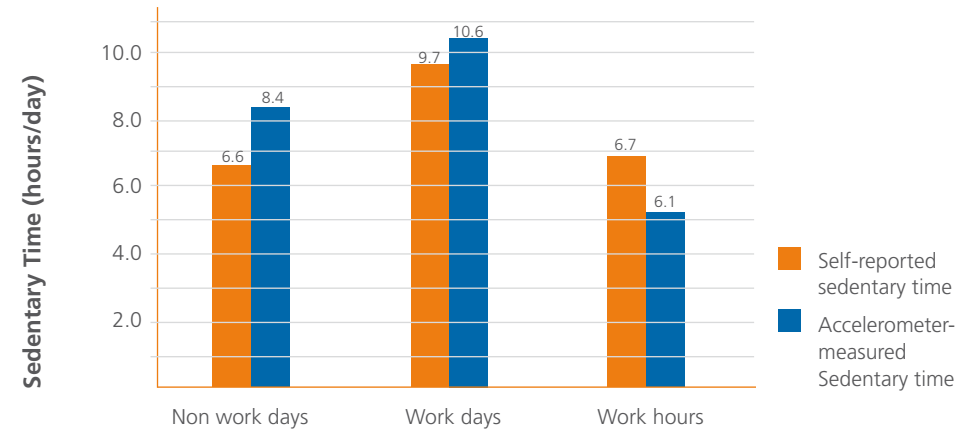
# Physical activity: objective vs self-reported measurements

Chart 4: Percentage of participants meeting the physical activity guidelines measured by self-report and objectively by accelerometer



# Sedentary time: objective vs self-reported measurements

Chart 5: Differences between self-reported sedentary time and objectively-measured sedentary time.



When considering the entire sample group, on average, there was relatively little difference between self-reported sedentary time and accelerometer-measured sedentary time. However, examination of the data at an individual level identified large variances between self-report and accelerometer measurements. Interestingly, those with less sedentary time tended to under-report their sitting time; those with more sedentary time tended to over-report their sitting time. On average, self-reported sitting time of the sample was 11 hours per day during workdays, of which approximately two-thirds (7.1 hours per day) was at work. Similarly, the average sedentary time (based on accelerometer measurement) was 10.7 hours a day, of which approximately two-thirds (6.1 hours per day) was during work hours.

The self-reported sitting time in this sample exceeds previous reports from a large sample of Dutch workers, in which sitting was 7 hours per day, one third of which was at work<sup>11</sup>.

Differences in study methodology (ie: sitting time questions) between the studies may provide a partial explanation for this discrepancy. While the study showed that sitting is prone to underestimation using self-reporting, the self-reported estimates of sitting time tended to be more accurate than those for physical activity. This also suggests that a more comprehensive approach to determining true physical activity levels of Australians should also examine sedentary (sitting) time in addition to self-reported data on physical activity. Similar consideration could also be given with the determination of the National Physical Activity Guidelines.

It is an unfortunate reality that objective sitting time measures may not always be available, so it is recommended that when using self-report instruments, sitting time needs to be captured across all domains, specifically both work and non-work domains given the large differences between sitting within and outside the workplace.



# Does gender make a difference?

Most of the study participants were women (60 percent).

There were no significant differences between genders in self-reported or accelerometer-measured sedentary time (on workdays or non-workdays).

For both men and women, sedentary time was significantly greater on workdays compared to non-work days.

## Recommendations

The magnitude of chronic diseases and poor health among working Australians, together with emerging evidence that sitting time increases risk, highlights the need for increased focus and resources to better understand and influence the potential hazards of prolonged sitting in the workplace.

In light of the findings that sedentary time occupies more than two-thirds of employees' working days, consideration should be given to trialling and evaluating initiatives to facilitate and support the reduction of sitting time in the workplace.

Innovations to support organisations and individuals to implement simple strategies for substituting sedentary time for light intensity physical activity during the work day should be considered. For example, strategies might include standing up whilst talking on the telephone or using a telephone headset to keep moving during phone calls. Other simple strategies might include arranging short breaks during prolonged sit-down meetings or re-organization of some work tasks to enable employees to stand or sit as they choose.

The Stand Up Australia study provides further evidence that organisations need to be prompted to consider sedentary work spent

Previous research has shown that more men than women meet the National Physical Activity Guidelines<sup>12</sup>. In this sample however, men and women did not differ significantly in their level of physical activity, regardless of whether it was leisure time or during work hours.

sitting in the workplace) as an emerging health issue. Future research should be directed towards expanding the knowledge base with respect to whether there are direct links between sedentary time at work and adverse health outcomes and consequently the influence of sedentary time on productivity and absenteeism.

The Stand Up Australia study provides some guidance for such future research, especially in highlighting the value of using modern technology (accelerometers) for measuring sedentary and physical activity time in the work and domestic settings. Importantly, perspectives on health-related physical activity are changing, with a much-greater emphasis on overall (rather than primarily leisure time and recreational) physical activity; particularly in occupational and commuting settings<sup>13</sup>. The study findings are timely since objective measurement of sedentary time and light intensity physical activity using accelerometers is a relatively new science. Objective measurement, through the use of accelerometer data, captures the broad-spectrum of physical activity, from sedentary through light-intensity to high-intensity and should be considered the gold standard for measurement.

Specific recommendations for employers:

- Prolonged sitting should be considered within occupational health and safety policies and practices just like other elements of posture<sup>14</sup>.
- Employers need to be aware of the levels of prolonged sitting among their employees during work hours – for example, by auditing levels of sitting in the workplace.
- Employers should explore opportunities to reduce sitting in the workplace – for example, through simple interventions (such as promoting and supporting standing meetings), possibly in combination with environmental interventions (such as height adjustable desks) that can promote postural transitions. It could be as simple as extra-long

telephone cords in the call centre which allow employees to stand during and between calls.

- Employers should engage in research to explore links between prolonged sitting and indicators of workforce engagement – absenteeism, presenteeism, or productivity.
- It will always be difficult to engage employees in moderate-to-vigorous activity during the work day but research has shown that light intensity activity is also beneficial and should be given increased recognition amongst employers. Getting employees moving is the most important thing – even 'non-sweaty' light-intensity activity is good for health and wellbeing.

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