



Daylight Saving And Its Effect On Physical Activity

Key findings of this bulletin

- ⇒ There was a significant increase in the amount of physical activity that both men and women between the ages of 16 and 64 did during and after the introduction of daylight saving.
- ⇒ There was no significant increase in the number of times people did physical activity.
- ⇒ Men showed a positive shift of 81 minutes since the introduction of daylight saving while women showed a positive shift of 38 minutes.
- ⇒ The impact of daylight saving was greatest for young men, who were not overweight or obese and who had a relatively high socioeconomic status.
- ⇒ While a higher proportion of people reported that they did their physical activity on the beach, the daylight saving period was also over the summer when an increase in the use of beaches would be expected. There were no other changes in where people usually did their physical activity.
- ⇒ There was a significant increase in the proportion of people who reported doing their physical activity during the afternoon or evening.

Background

Physical activity has been shown to help prevent many chronic conditions such as heart disease and non-insulin dependent diabetes by increasing cardiovascular functions and decreasing body fat.^{1,2,3} It also is a factor in the quality of life. People who have chronic health conditions and who are physically active report a higher quality of life compared with those who are not active.⁴

The introduction of daylight saving on the 3rd December 2006 provided a unique natural experiment to measure the effect, if any, additional “daylight” had on participation in physical activity. Details of the data source and methodology for this bulletin can be found on page four.

Introduction

From 2002 to 2006, there has been a decrease in the proportion of Western Australian adults aged between 16 and 64 who do enough leisure time physical activity for a health benefit. The percent of Western Australians in this age group who reach the Active Australia guidelines for sufficient activity compared with the percent of Western Australians in this age group who reach the Physical Activity Task Force (PATF) guidelines for physical activity is shown in Table 1.^{5,6,7}



Table 1 Percent of Western Australian aged between 16 and 64 years who do sufficient physical activity for a health benefit: Active Australia compared with PATF guidelines by sex and year

	<i>Active Australia - 150 moderate minutes over 5 or more sessions</i>			<i>PATF - either 150 moderate minutes over 5 or more sessions OR 60 minutes of vigorous activity weekly</i>		
	Males	Females	Persons	Males	Females	Persons
2002	60.5	54.6	57.6	65.8	58.0	61.7
2003	57.6	49.3	53.5	65.0	54.9	60.0
2004	54.5	50.3	52.4	63.6	54.7	59.2
2005	48.9	48.1	48.5	58.0	54.0	56.0
2006	48.4	44.3	46.4	57.6	50.4	54.0

The introduction of daylight saving appears to have changed the downward trend for both men and women (Figure 1 and Figure 2).

Figure 1 The mean minutes of physical activity for WA males aged between 16 and 64 years Mar 2002 to Sept 2007

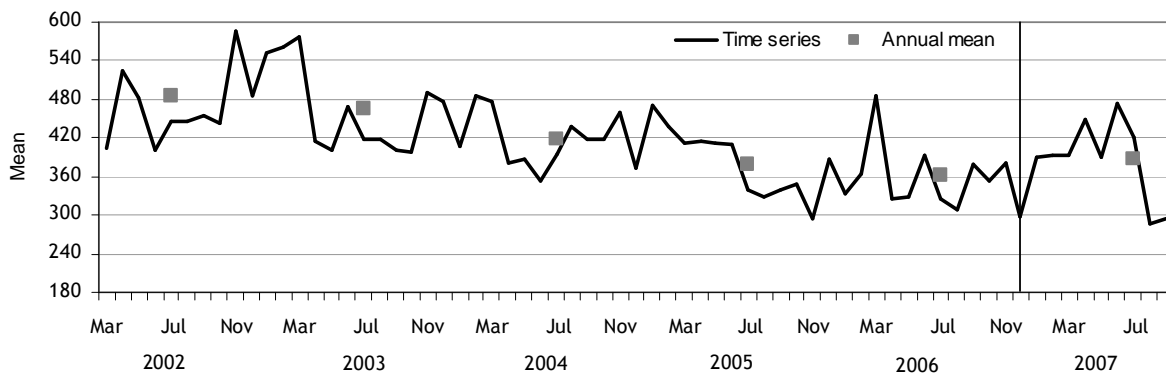


Figure 1 time series indicates a pronounced downward trend over time and the impact of daylight saving for men.

Figure 2 The mean minutes of physical activity for WA females aged between 16 and 64 years Mar 2002 to Sept 2007

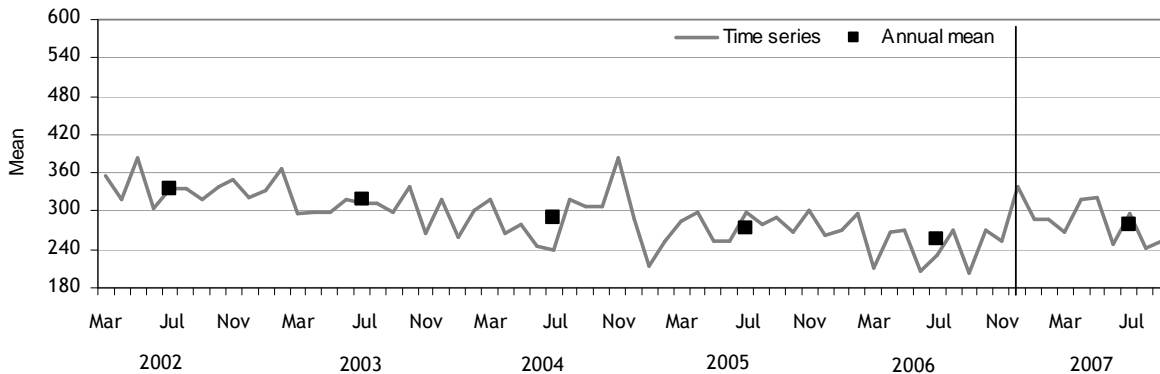


Figure 2 time series indicates a sustained but less pronounced downward trend with less clear impact of daylight saving.



Time Series analysis⁸ indicates that the impact of daylight saving is significant for both males and females. Males show a positive shift of 81 minutes after the introduction of daylight saving and females show a more modest but positive shift of 38 minutes after the introduction of daylight saving.

Log-linear modeling⁸ adds additional information to the time series analysis showing that there is a significant increase in time spent doing physical activity during months of daylight saving compared to the same months in the previous two years and the strongest association is between time spent doing physical activity and being a younger male. There was no significant increase in the number of times people did physical activity.

Table 2 Log Linear model of daylight saving, physical activity, age and sex

Variables	Coefficient	LCL	UCL	p
Daylight saving months	0.121	0.021	0.0222	0.018
Age (years)	-0.014	-0.018	-0.015	<.001
Sex (M)	0.367	0.275	0.460	<.001
Constant	3.315	3.158	3.471	<.001

When socio-economic indicators are added to the model as well as a measure of weight (Body Mass Index) the impact of daylight saving is reduced by about 50% and is no longer statistically significant. This more complete model indicates that daylight saving has its greatest impact in younger males who are of higher socio-economic status and with low BMI.

Table 3 Log Linear model of daylight saving, physical activity, age, sex, body mass index and selected socio-economic indicators

Variables	Coefficient	LCL	UCL	p
Daylight saving months	0.069	-0.038	0.177	0.207
Age (years)	-0.009	-0.014	-0.005	<.001
Sex (M)	0.366	0.260	0.474	<.001
Income (>\$60,000)	0.185	0.080	0.291	0.001
Education (Further education)	0.140	0.036	0.244	0.009
SEIFA (Top two quintiles)	0.333	0.264	0.454	<.001
Body Mass Index	-0.025	-0.361	-0.142	<.001
Constant	3.500	3.20	3.800	<.001





Additional questions were added to the WA Health and Wellbeing Surveillance Systems enquiring about where and when people did their physical activity. When these were compared for the time during daylight saving and the time after daylight saving the following results were found:

- There was a significant increase in the proportion of people who went to the beach for their exercise, but this may have been due to the season (summer).
 - There was no significant difference in the proportion of people who reported that they did their physical activity in the morning or during the day.
 - There was a significant increase in the proportion of people who reported that they did their physical activity in the afternoon and evening during daylight saving.

The information contained within this bulletin is based on data from the WA Health and Wellbeing Surveillance System (HWSS). The HWSS is a continuous data collection system that over the course of twelve months, surveys over 6500 Western Australians of all ages. Information is collected on a wide range of health and wellbeing issues, health conditions, lifestyle risk factors, protective factors and demographics. The HWSS is conducted as a Computer Assisted Telephone Interview (CATI). From December 2006 questions about where and when people did their physical activity were added to the survey and are scheduled to remain until after the end of this year's daylight saving period. Other publications based on information from the HWSS can be found at www.health.wa.gov.au/publications/pop_surveys.cfm.

References

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7. Active Australia defines sufficient physical activity as 150 minutes of moderate activity over five or more sessions each week . The Physical Activity Taskforce defines sufficient physical activity as either doing 150 minutes of moderate activity over five or more sessions or doing 60 minutes or more of vigorous physical activity independent of the number of sessions each week.
8. Details of the methods used to conduct the analysis are being prepared for publication in a peer-reviewed journal.

This bulletin is based on a presentation prepared for the 5th International Conference on Behavioral Risk Factor Surveillance, authored by Daly A, Phillips M, Camprostrini S and Rosenberg M.