

Understanding Reported Rates of Physical Activity: Comparing the Results of the Alberta Survey on Physical Activity and Canadian Community Health Survey



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Understanding Reported Rates of Physical Activity: Comparing Results of the Alberta Survey on Physical Activity and the Canadian Community Health Survey



Two major surveys recently examined physical activity levels in Alberta: the *Alberta Survey on Physical Activity* (García Bengoechea, & Spence, 2002) and *Canadian Community Health Survey* (Statistics Canada, 2006).

The Alberta Centre for Active Living (formerly the Alberta Centre for Well-Being) has collected data on Albertans for the *Alberta Survey on Physical Activity* every two years since 1995. The same data collection methods have been used since 2000, allowing for a longitudinal comparison from 2000 to the present.

The *Canadian Community Health Survey* is a national Statistics Canada survey that includes provincial data. This survey went through its second cycle in 2002/03.

How Are the Two Surveys Different?

The 2002 *Alberta Survey on Physical Activity* (García Bengoechea & Spence, 2002) found that 57% of Albertans were active. (The figure in the most recent *Alberta Survey on Physical Activity* (García Bengoechea, Spence, & Fraser, 2005) has increased to 60.4%.)

The latest data available from the *Canadian Community Health Survey* (2002–2003) showed that 52% of Albertans were at least moderately active (Canadian Fitness and Lifestyle Research Institute, 2005). This result is based on combining the 27% who are considered active according to *Canadian Community Health Survey* criteria with the 25% who are considered moderately active.

Therefore, when comparing the 2002–2003 data, there is potentially a 5 percentage point difference in results between the two surveys. The purpose of this paper is to discuss the possible reasons for the discrepancy to try to better understand the physical activity of Albertans.

Reasons for the Differences

a. Different definitions of physical activity

On the surface, the reason for the discrepancy is quite simple. Each organization has defined physical activity differently. As Washburn, Heath & Jackson (2000, p. 104) note, “the most difficult problem in establishing the validity of a physical activity survey is the lack of an accepted criterion measure of physical activity with which questionnaire results can be compared.”

When describing and measuring physical activity behaviour, three components are required: frequency, duration, and intensity. Frequency and duration are defined in both surveys and are shown in Table 1.

Table 1. Comparison of the 2002 Alberta Survey on Physical Activity and Canadian Community Health Survey Data Collection Methods and Results

SURVEY	DURATION	FREQUENCY	TIMEFRAME	MODERATELY ACTIVE	PHYSICALLY ACTIVE	TOTAL PHYSICAL ACTIVITY
ALBERTA SURVEY ON PHYSICAL ACTIVITY	> 15 min.	Open-ended*	One week	Defined: N/A	Defined: 2,000 kcals/wk	57%
					Results: 57%	
CANADIAN COMMUNITY HEALTH SURVEY	Options: 1–15 min.	Open-ended**	Three months	Defined: 1.5 < KKD*** < 3.0	Defined: > 3.0 KKD	52%
	16–30 min. 31–60 min. > 1 hour			Results: 25%	Results: 27%	

Notes:

* The question was “how many times....” over the last week with no limits.

** The question was “how many times....” over three months, with a maximum of 99 times, with the exception of 270 for walking, and 200 for bicycling.

*** KKD = daily expenditure of kilocalories per kilogram of body weight.

Alberta Survey on Physical Activity

The *Alberta Survey on Physical Activity* uses the Godin Leisure Time Questionnaire (Godin & Shephard, 1985) as the basis for its physical activity questions. Participants note the weekly frequencies of strenuous, moderate, and mild activities for a duration of at least 15 minutes at a time.

These frequencies were multiplied by their estimated value in METs¹ (nine, five, and three respectively). Total weekly leisure activity was calculated by adding the results of the separate components.

Based on cut-offs determined by García Bengoechea, Spence, & McGannon (2005), men were considered sufficiently physically active if they expended 38 METs a week, while women were considered physically active if they expended 35 METs a week.

According to Jacobs, Ainsworth, Hartman and Leon (1993), these measures equal 300 to 400 MET-minutes per day. This number of MET-minutes equals 2,000 kcals per week (Elosúa et al., 2000). An

¹ A MET is the ratio of energy expended in kilocalories divided by resting energy expenditure in kilocalories. A MET is a unit of resting metabolic rate. Thus, two METs are equivalent to an intensity twice that of the resting metabolic rate.

energy expenditure of 2,000 kcals or more per week is associated with a reduced risk of heart disease (Paffenbarger, Wing, & Hyde, 1978). Therefore, if a participant reported enough light activity, with no moderate or vigorous activity, he or she could still be considered sufficiently active. No criteria were established for participants to be categorized as moderately active. In the final reporting, they were either active or inactive.

Canadian Community Health Survey

The questions on the *Canadian Community Health Survey* are adapted from the *Minnesota Leisure Time Physical Activity Questionnaire* (Taylor et al., 1978). Physical activity is estimated as energy expenditure in all non-work, non-chore activity.

According to the *Canadian Community Health Survey*, if people are not expending, on average, 3 kilocalories per day per kilogram of body weight (KKD) due to physical activity, they are not experiencing health benefits. In order to calculate energy expenditure, the *Canadian Community Health Survey* probes respondents about their participation in 25 different activities. The survey asks respondents how many times over the past three months they were active and how much time was spent on each occasion (see Table 1). The survey takes into account the self-reported frequency and duration of participation in these activities.

b. Timeframe and intensity

Examining the two different data collection methods, it is evident that the differences between the two surveys' findings likely relate to timeframe and the intensity of the activity. For example, in terms of timeframe, participants are asked to recall their activities over one week (*Alberta Survey on Physical Activity*) or three months (*Canadian Community Health Survey*).

The *Canadian Community Health Survey* uses a very conservative estimate of the intensity expended during a particular activity. There is also an "any other" physical activity category, which leaves it up to the respondent to interpret what he or she considers physical activity. As will be further discussed in the next section, the subjective interpretation of intensity and the different options given participants may have affected their recall.

c. The challenges of self-reporting

Both surveys rely on self-report. It can be difficult to remember absolute time spent in physical activity. Sallis and Saelens (2000) have argued that most studies show that self-reports are not accurate for measuring absolute time spent in physical activity. Further, few self-report measures have been validated with alternative populations such as the elderly or people from different cultures. The measures have also not been validated for measuring weight-bearing activity, sedentary behaviour, or strengthening or flexibility exercises.

Given that respondents to both the *Alberta Survey on Physical Activity* and the *Canadian Community Health Survey* categorize their own physical activity, the validity of these surveys becomes an important issue. Morrow et al. have noted that the general population understands traditional

physical activity more than lifestyle physical activity (Morrow, Krzewinski-Malone, Jackson, Bungum, & Fitzgerald, 2004).

At this point, it is very difficult to know whether Canadians are embracing the idea of lifestyle physical activity. For example, very active people may not count walking as activity, whereas very inactive participants might consider brushing their teeth as contributing to overall physical activity.

d. Response scales

Another difficulty is response scales. Courneya, Jones, Rhodes, & Blanchard (2004) found that some physical activity questionnaires included a high frequency option, e.g., in answer to the question, “How many times did you exercise strenuously (i.e., sweating and breathing hard) for at least 30 minutes in the past 30 days?” Possible answers to this question included <15, 15–17, 18–20, 21–23, 24–26, 27–29, and 30+.

This scale resulted in three times as many participants meeting the minimum amount of physical activity as a low frequency option (where the possible answers were: 0, 1–2, 3–5, 6–8, 9–11, 12–14, and 15+).

Courneya, Jones, Rhodes, & Blanchard (2004) speculate that these very different results are due in part to exercise being a highly irregular behaviour (i.e., usually taking place on different days of the week, at different times, for different frequencies), and therefore people use different strategies to estimate exercise. One of these strategies includes relying on the response scales provided. As noted in Table 1, the duration aspect of the *Alberta Survey on Physical Activity* and the *Canadian Community Health Survey* are different, which may affect how people respond to the questions.

e. Who are the respondents?

It is also important to understand who agrees to participate in the surveys and who decides not to participate. Both the *Alberta Survey on Physical Activity* and *Canadian Community Health Survey* use a random digit dialling telephone survey technique. Potential respondents are cold called and asked if they want to participate in a survey.

Although this is among the strongest participant selection techniques, the response rates can still be quite low. What are the relative characteristics of respondents in comparison to non-respondents? Although non-response bias is not a given, it should be considered as a possibility, as low response rates limit generalizability.

Major reasons for non-response include inability (e.g., due to illness or a language barrier) or non-compliance (choice not to respond) (Rogelberg & Loung, 1998). Further, Rogelberg and Loung’s data indicate that interest may be related to response. People interested in a topic are more likely to respond to a survey on that topic.

The physical activity questions in both the *Alberta Survey on Physical Activity* and *Canadian Community Health Survey* were embedded in a larger “health” survey. Those interested in health topics may be more likely to respond to the survey. People interested in physical activity (and

therefore more likely to be physically active) may be the ones who respond to these surveys, thus skewing the results to misrepresent the population as more active than it is.

Further, education is the one socio-demographic variable that consistently distinguishes respondents from non-respondents (Rogelberg & Loung, 1998). Respondents are more highly educated than non-respondents. Compared with the overall Alberta population, where 54.7% of the population has post-secondary education (Statistics Canada, 2004), 68.9% of the respondents to the *Alberta Survey on Physical Activity* reported post-secondary education. As higher education is strongly associated with increased physical activity, this discrepancy has implications for the results of the study. In other variables (e.g., gender, age), the survey respondents were similar to Albertans in general.

Table 2 outlines the demographic characteristics of the Alberta population (based on Canadian census data, Statistics Canada, 2001) compared with *Alberta Survey on Physical Activity* respondents.

Table 2. Alberta Physical Activity Survey Respondent Demographics Compared to Alberta Overall*

STATISTIC	ALBERTA**	ALBERTA SURVEY ON PHYSICAL ACTIVITY
EDUCATION	<High school: 33.6%	<High school: 11.4%
	High school: 11.7%	High school: 19.5%
	Post-secondary: 54.7%	Post-secondary: 68.9%
WHERE DO YOU LIVE?	Urban: 81%	Urban: 84%
	Rural: 19%	Rural: 16%
GENDER	Male: 50.5%	Male: 49.9%
	Female: 49.5%	Female: 50.1%
AGE Note: The “Alberta” numbers are Canadian statistics. Numbers in brackets are the percentage of Canadians aged 18 and over in that age bracket. For example, although 14.5% of the overall Canadian population is 18–24, 17.6% of Canadians 18 and over are 18–24. This calculation allows us to better compare the “Alberta” numbers with the <i>Alberta Survey on Physical Activity</i> data.	18–24: 14.5% (17.6%)	18–24: 11.9%
	25–34: 13.7% (16.6%)	25–34: 17.9%
	35–44: 15.8% (19.1%)	35–44: 21.4%
	45–54: 15.2% (18.4%)	45–54: 21.1%
	55–64: 10.9% (13.2%)	55–64: 13.3%
	65+: 13% (15.8%)	65+: 13.1%

Notes:

*The census data (Alberta) is based on those aged 15 years and over, whereas the *Alberta Survey on Physical Activity* data are based on those 18 years and over (which would account for some of the differences).

** Data obtained from Statistics Canada, 2001.

A Larger Problem

The difficulty in comparing survey results is not unique to Albertan or even Canadian data. As Brown and Miller (2005) point out, the same difficulty exists in comparing US and Australian data because of the different criteria used to establish physical activity.

To test this supposition, Brown and Miller (2005) analysed the Australian data set using both Australian and American criteria and then compared the subsequent rates of physical activity. They concluded that the differences between Australian and American rates of physical activity were much closer than previously thought.

Fully 15% of the sample respondents were classified as active using Australian criteria, but as inactive according to American criteria. Taking this into account, it may be that the Australian rates of physical activity (58.3%) and American rates (45.4%) are not so different after all.

Conclusion

It is not possible to say that one survey is more accurate than another. However, it is fair to say that both surveys are strong methodologically. Although there are limitations, there are also strengths.

For example, both surveys rely on valid and reliable measures that are among the best currently available. Another strength is the random digit dialling telephone technique, which allows for the most representative respondents possible. According to Statistics Canada (2005), only 0.85% of Canadian households report not being able to afford telephone service, meaning that 99.15% of households can be contacted.

Another major strength is that both surveys have used the same data collection techniques over several data collection periods, allowing longitudinal comparisons. Using the same questionnaire in several surveys reveals physical activity trends among Albertans. It is also positive that there is more than one survey, so that we can get as complete a picture as possible.

It is not possible to say with absolute certainty that x% of Albertans are sufficiently active to achieve health benefits. Although Canadian public health guidelines advocate for 30 minutes of physical activity on most days of the week, neither the *Alberta Survey on Physical Activity* nor the *Canadian Community Health Survey* allow for this kind of reporting. Both surveys report on the proportion of people who meet energy expenditure criteria (in kilocalories) as opposed to physical activity behaviour. Instead of stating that a certain percentage of people are physically active, they are telling us that a certain percentage of people expend energy at a suitable level. In other words, instead of talking about what people are doing, they tell us how many calories they are burning.

In conclusion, despite their limitations, both surveys provide valuable information about the rates of physical activity in Alberta. The surveys complement each other and provide unique information that furthers our understanding of physical activity in Alberta.

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