Introduction

Overview

This report presents findings for data collected during 2018–19 for the Queensland Sport, Exercise and Recreation Survey of Children (QSERSC): A proxy–based, dual frame prevalence study of children's physical activity outside school hours. Participation was measured for children aged between 5 and 17 years, with parents and carers used as a proxy to report activity participation. A single child was randomly selected from within the household for parent/carer reporting. Dual frame refers to the sampling of parents/carers in households with landline telephones and/or mobile telephones.

The following definitions guided the survey:

Physical activity: Any bodily movement produced by skeletal muscles that requires energy expenditure and produces progressive health benefits (US National Institutes of Health and World Health Organization).

Sport: Human activity capable of achieving a result requiring physical exertion and/or physical skill which, by its nature and organisation, is competitive and is generally accepted as being a sport (Clearinghouse for Sport and Physical Activity).

Exercise: A type of physical activity that is planned, structured and repetitive and has the objective of achieving, improving or maintaining physical fitness (attributes that are health or skill–related) (adapted from Casperson *et al* 1985).

Recreation: Any physical activity undertaken during leisure time outside of structured, competitive sport, including unstructured play involving physical activity/exertion (Adapted from Sport and Recreation Victoria).

Other definitions used in the study are in Appendix A. The specific physical activities coded as sport, exercise, recreation or other types of activities are in Appendix B.

The study was conducted on behalf of Sport & Recreation, Department of Housing and Public Works, within Queensland Government. Data collection was undertaken between December 2018 and April 2019.

Methodology in summary

A detailed technical report on the study methodology is presented in Appendix D. A brief summary of the methodology also follows.

A total of 5273 Computer Assisted Telephone Interviews (CATI) were conducted with parents or carers of children 5 to 17 years across five sampling regions within Queensland. Each sampling region included three sampling bands based on Local Government Areas with large, medium and small populations (making a total of 15 sampling strata) (or suburbs for Regions north and south of the Brisbane River). This ensured that all areas of each Queensland location were sampled and not just major towns.

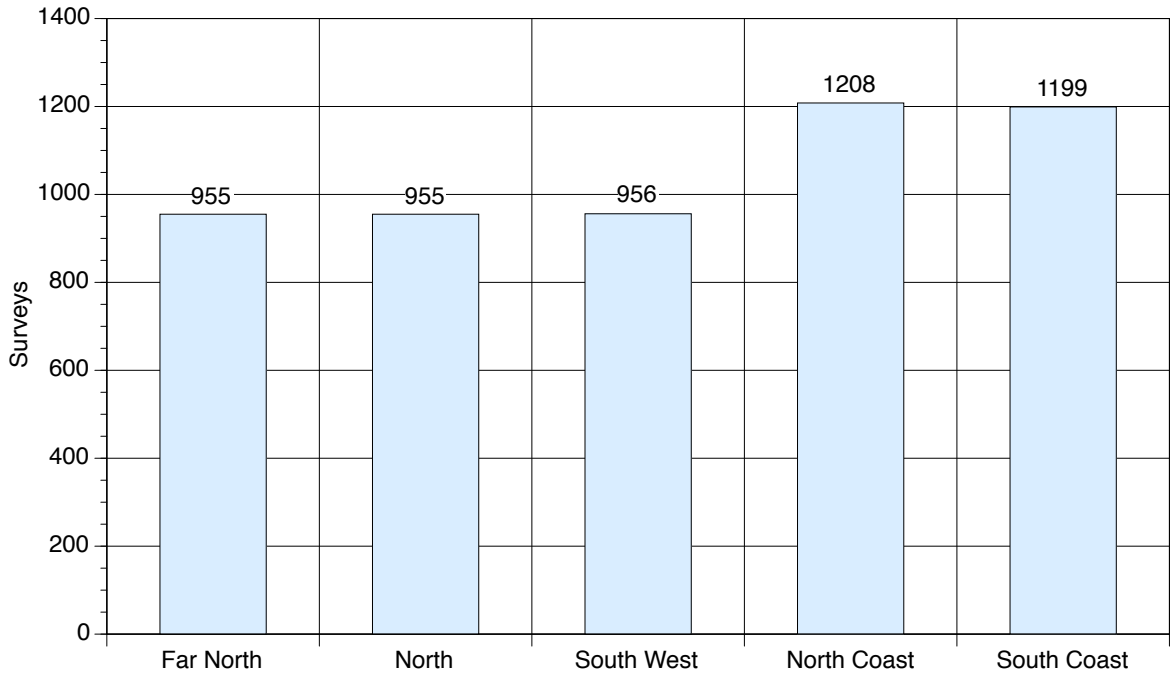
Departmental Service Regions were used during sampling to ensure that survey results could be used for strategy development and planning within each Service Region. The survey was approximately 12 minutes in length, established through a field pilot.

Quotas were set for sampling within the five Departmental Service Regions and three (within–region) sampling bands to develop a survey population of children 5–17 years that was representative of the Queensland population of children each for boys and girls within four age groups – 5–8 years, 9–11 years, 12–14 years and 15–17 years.

A dual frame sample was developed for sampling to ensure representation of 'mobile only' households. This included conduct of 1,698 landline surveys and 3,375 mobile surveys to form a total sample of 5273 surveys. Data was weighted using a complex weighting procedure to adjust for the probability of respondent selection and to additionally correct for the dual frame sampling design.

An overview of the final survey sample by Service Region sample is in Figure 9.

Figure 9. Sampling by Sport & Recreation Service Regions of Queensland
(N=5273, December 2018–April 2019)



To ensure a high quality approach to sampling, parents/carers with boys and girls within each of the four children's age groups were sampled proportional to the ABS population of children within each gender. In addition, to ensure a scholarly approach to measuring the prevalence of children's participation in physical activity, this approach to sampling was also applied within each region and sampling band (i.e., Quotas were placed on boys and girls individually for each of the four age groups by 15 sampling bands).

While proportional gender by age quotas were possible for virtually all Service Regions, some sampling challenges presented for Far North Region sampling bands 2 and 3, as these bands consisted of small Aboriginal and/or Torres Strait Islander communities and very remote areas of Queensland.

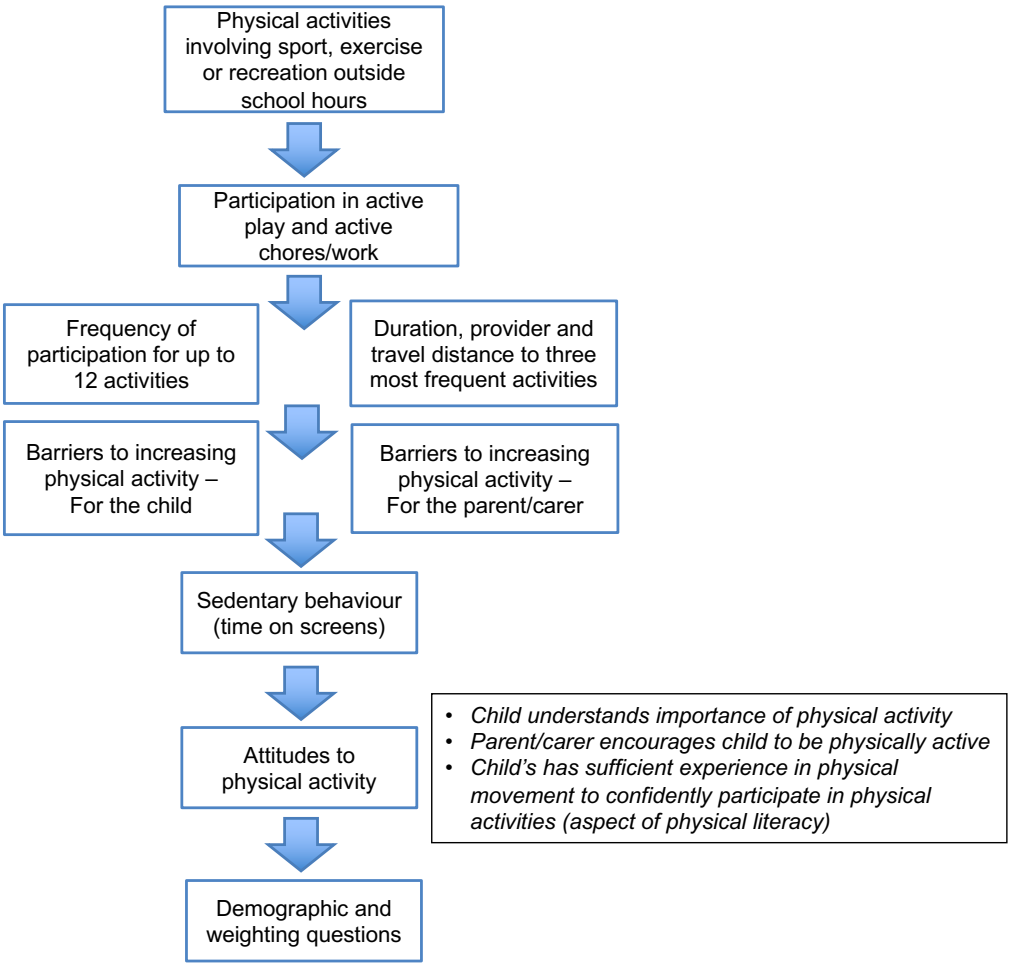
Highlighting these sampling issues, Band 2 consisting of LGAs such as Cook, Torres Strait, Aurukun and Napranum, only had a total population of 6,805 children 5–17 years and Band 3 consisted of LGAs such as Kowanyama, Pormpuraaw and Burke and only had a population of 785 children 5–17 years.

As commercial mobile and landline telephone lists are limited for such locations (and landline penetration in these locations is limited, precluding use of random digit dial landline), sampling shortfalls were re–allocated in Far North Region bands 2 and 3 to Far North Region band 1 where necessary. In spite of this, 139 surveys were still achieved in Band 2 and 18 surveys in band 3 after a 'free find' number search exercise in the targeted remote locations was undertaken via the internet.

Study measures in summary

An overview of study measures is presented in Figure 10. The survey instrument is in Appendix C.

Figure 10. Study measures used in the study (2019)



Data weighting

A specialised dual frame data weighting methodology was used to weight the landline and mobile samples in the current study. Prior to commencement of data weighting, data weighting variables were examined for missing data and random observations imputed. While soft quotas were set on Service Region and LGA sampling bands, as LGAs were verbally confirmed during interviews, the final confirmed location was used for data weighting. This helped to ensure that all respondents were in the correct sampling band.

The weighting methodology developed for the dual frame study was designed to manage the issue that landline and mobile surveys come from different sample frames with potential for overlap. For instance, many people in Queensland have both a landline and a mobile and this affects their probability of selection for interview. Similarly, some households only have a mobile alone (termed 'mobile–only' households).

The dual frame weighting methodology had five key components to ensure that the probability of respondent selection could be appropriately adjusted and that the sample could be then weighted to Queensland population benchmarks of children. This was deemed appropriate, as while parents/carers were interviewed, they were essentially only proxies for their child.

Given that children were the real units of sampling (rather than parents/carers who were generally only used as proxies to report their child's activities), a reference population of children aged 5–17 was used for the purpose of data weighting. This reference population was broken down into four age categories (5–8 years, 9–11 years, 12–14 years, 15–17 years) and two genders (male, female) for each of the five Service regions.

Rates of consent and response

The overall rate of consent for the study was 82% for the landline sample and 86% for the mobile sample. An extensive program of soft refusal conversions had to be undertaken to increase the rate of consent to this level (including several rounds of re–contact. The rate of response using the more conservative method was calculated to be 49%, while using the less conservative method the rate of response was calculated to be 64%.

Approach to statistical analysis and use of survey weights

Data was analysed using Stata 15 and SPSS Version 22. Analyses conducted through Stata were conducted through the Stata survey (svy) module where possible to ensure that confidence intervals and associated standard errors were appropriately corrected based on the complex sampling design. This allows sampling weights, clustering and stratification to be accounted for in the calculation of standard errors.

Several statistical procedures were used to support the analysis of study results. For continuous and scale based variables, t–tests were used to identify significance differences between means across groups of interest. For categorical data, logistic regression was used to identify significant trends.

When this latter analytical approach was used, odds ratios were generated and indicated through OR. Odds ratios present a method used in epidemiological research for comparing the odds of an event between two groups.

An odds ratio of 1 implies that a result is equally likely in both groups. An odds ratio greater than one implies that the event is more likely in the second group compared to the 'reference group'. An odds ratio less than one implies that the result is less likely in the second group (compared to the reference group).

Odds ratios in the current report have been presented to allow identification of general trends in data at a top line level. While odds ratios can be adjusted for a wide range of covariates (e.g., age, gender, education level etc.), adjustments to odds ratios are generally not relevant in prevalence studies that seek to identify overall trends in a population. However, further examination of covariates may add value to study insights.

Probability values or p values less than 0.05 were used to assess statistically significant differences (indicated through $p<.05$). This implies that the null hypothesis (i.e., the theory that there is no difference between groups) must be rejected and differences between groups are unlikely to be due to random sampling error.

While $p<.05$ is used to infer statistically significant differences (rejection of the null hypothesis), p values lower than this threshold are provided for reader reference. Results where p values are lower than .05 (e.g., $p<.01$, $p<.001$) may provide stronger evidence for rejection of the null hypothesis. It should be noted that lower probability values are proposed by some authors as needed to reduce the likelihood of incorrectly rejecting the null hypothesis (e.g., Benjamin et al, 2017). Given the many hundreds of exploratory analyses conducted in the study, Bonferroni and other adjustments for multiple comparisons were not deemed appropriate for the study.

Standard errors and confidence intervals associated with major study results are provided. Confidence intervals provide a margin of error around study results. The 95% confidence interval, denoted by the error bars defining the upper and lower confidence levels for results, reflects that the true population value for a particular characteristic is expected to lie within this range in 95% of samples undertaken.

Standard errors provide an indication of the preciseness or lack of preciseness of each result. Study results with wide confidence intervals and large standard errors (especially 25 per cent or greater than the result itself – a best practice statistical standard, as used by organisations such as the Australian Bureau of Statistics) should be interpreted with caution.