Discussion of key findings

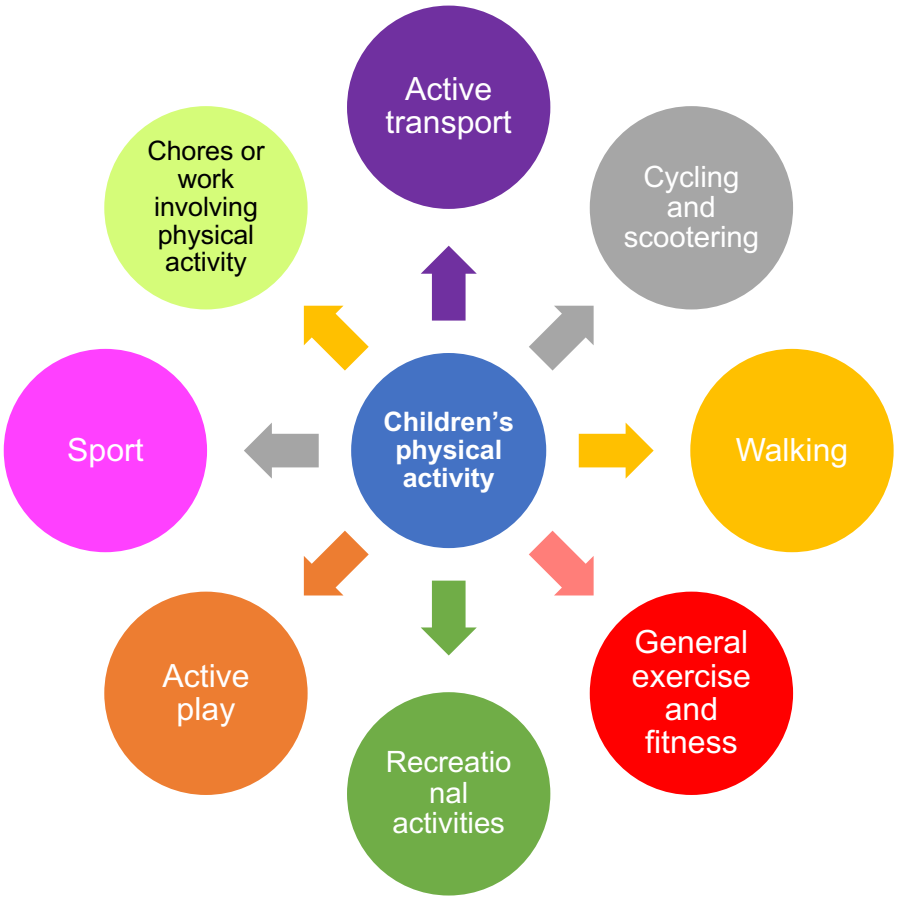
A new framework for understanding children's physical activity in Queensland

Findings of the current study highlight a range of new insights about children's physical activity in Queensland. To better understand the prevalence of physical activity, results were analysed to produce participation and frequency estimates for *not only* individual sport, exercise and recreation activities, but *also* for major types of physical activity undertaken by Queensland children.

This provides a new methodology and framework for understanding and monitoring physical activity of children in Queensland. In this context, aggregated prevalence estimates for activities comprising Active transport, Cycling and scootering, Walking, General exercise and fitness, Sport, Recreational activities, Active play and Chores or work involving physical activity provide a robust baseline for designing and implementing strategies to target future improvements across these domains.

It should also be noted that, while the classification of some activities may be debated (and it is accepted that the classification is only approximate – Refer Appendix B for further information on how activities were aggregated), aggregating activities in clusters to identify meaningful trends provides useful insight into likely physical activity preferences and behaviours of Queensland children.

Indeed, there is great potential to increase children's overall physical activity by encouraging parents/carers to increase their child's involvement in physical activity across these domains. To do this effectively, each area may benefit from the design and implementation of strategies.



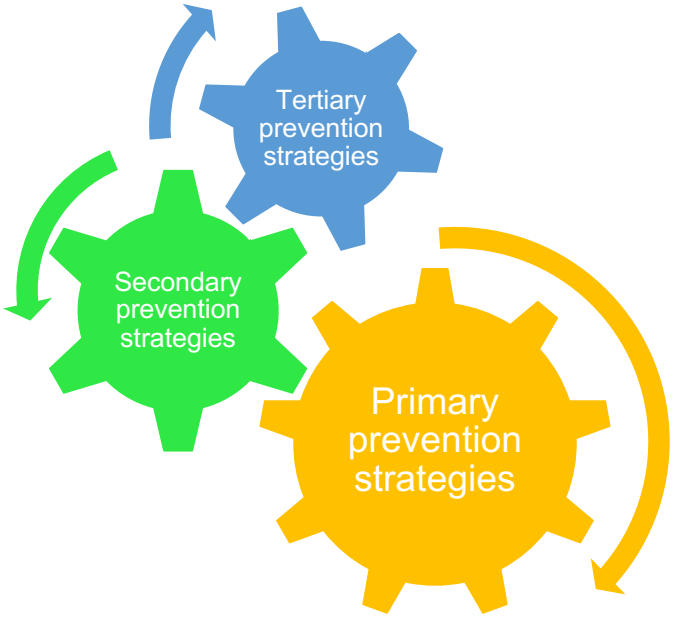
While data on individual activity participation still has value in many settings (e.g., Knowing that soccer participation is high may support funding of soccer programs), focusing on individual activity participation alone can make it difficult to understand and monitor changes in children's overall physical activity.

In this respect, the current study attempts to move beyond enumeration of children's individual activity participation to examine the prevalence and predictors of physical activity across major domains of physical activity. This is also a common and well–accepted approach in epidemiological studies in public health settings.

Prevalence studies are primarily undertaken to identify the distribution of particular characteristics or health issues (e.g., disease, physical activity) in a given population and provide data to help design ways to achieve public health outcomes.

Three major types of physical activity strategy are also possible in such settings:

- **Primary prevention strategies** – Aim to influence physical activity in the mainstream population and relatively healthy population, such as implementing general walking or active transport programs. They aim to ensure children achieve recommended physical activity levels (often called primary prevention strategies)
- **Secondary prevention strategies** – Aim to influence segments of the population that may be at–risk for low physical activity, are still relatively healthy (e.g., kids spending too much time on screens) (often called early intervention strategies, as they focus on preventing at–risk segments from stopping physical activity)
- **Tertiary prevention strategies** – Aim to 'treat' segments known to not undertake physical activity (e.g., Children with disabilities, children disliking physical exercise, other vulnerable populations who are already impacted by low physical activity)



From this perspective, there is potential to explore primary, secondary and tertiary intervention strategies for each of the major domains of physical activity in the framework and monitor changes across these domains over time.

Given that some domains of physical activity in the framework intersect with other areas of the community, this also raises the possibility for different organisations and Government agencies to collaborate on strategies to influence children's physical activity (including within State and local government and within the private sector).

The relevance of the new framework is also supported by research findings. In particular, it is clear from a review of children's physical activity participation that low physical activity children are generally less interested in all forms of physical activity, but still have some level of higher involvement in certain activities (e.g., Sport, General exercise and fitness, Active transport). Accordingly, data may be used to improve the targeting of programs to low participation segments.

While it is beyond the scope of this discussion to identify specific strategies, a range of study insights have broad application to policy, strategy and program design for children's physical activity. These are discussed below.

Framework and study data provide insights into age, gender and statewide physical activity preferences

The framework used in the study provides useful insights into the participation of Queensland children in major types of physical activity by age and gender. For instance, results highlight Active play is the highest participation individual physical activity for children 5–8 years and children 9–11 years. However, Chores or work involving physical activity is the top individual highest participation physical activity for children 12–14 years and 15–17 years.

Interesting gender differences similarly emerged. Boys had higher overall physical activity participation compared to girls in some activities (e.g., Sport, Cycling and scootering), while girls had higher physical activity participation than boys in other activities (e.g., Walking, Recreational activities).

Such findings may highlight the potential for future targeting of physical activity strategies by age and gender. In particular, they highlight the potential to encourage some age groups and genders to be more involved in certain types of physical activity and provide an indication of possible barriers to activity participation. For instance, girls could be steered towards more Sport given their lower participation, though may respond better to General exercise and fitness activities and Walking programs, as they *may* be more interested in these (although this would ideally benefit from further qualitative research).

Framework and study data show that physical activity is far broader than just sport and includes many informal activities

Results on the share of activities – relative to total activity frequency – also highlight that Queensland children's physical activity needs to be viewed as far broader than just 'sport'. This has also been a growing trend in many international jurisdictions, which now examine active play and active transport as key parts of children's overall physical activity (e.g., Denmark).

In this respect, it is noteworthy that Sport interestingly comprises an average of 12.3% of Queensland children's total activity frequency, while Active play contributes an average of 23.4%, General exercise and fitness 13.1%, Cycling and scootering contributes 11.3%, Active transport 10.9% and Chores or work involving physical activity 16.3%.

In addition, findings of the study highlight that many Queensland children take part in many informal rather than organised activities. In particular, it is noteworthy that many Queensland children do their own Cycling and scootering, General exercise and fitness activities, Walking and Recreational activities, highlighting the potential for an increasing number of programs to further encourage such behaviour.

Findings may also have implications for directing future funding to initiatives to encourage children to become more physically active across a broader range of physical activity domains.

Sedentary behaviour and screen time in Queensland children

One of the most important findings of the current study relates to the sedentary behaviour of many Queensland children. In particular, results showed that around 40% of Queensland children 5–17 years are spending more than 2 hours per day on screens, which is the nationally recommended maximum.

It is also apparent that adolescents are far more at–risk from this behaviour, with 52% of 12–14 year olds and 72.7% of 15–17 year olds spending more than 2 hours per day on screens (compared to only 17% for 5–8 year olds and 28.1% for 9–11 year olds).

While school work pressures are higher during adolescent years, feedback from parents/carers indicates that elevated levels of sedentary screen time in adolescents are largely due to use of screens for leisure, entertainment and other reasons not associated with school–related screen time.

The tendency for low physical activity children in teenage years to spend extremely high amounts of time on screens each day also suggests that screen time may be cannibalizing the time available to teenagers to be physically active.

Most barriers for children's physical activity are actually parent/carer barriers

Findings of the study similarly reveal a range of important insights relating to barriers to children doing or increasing their physical activity. When asked to report child–related barriers, it was noteworthy that over half of parents/carers (55%) report there were really 'no barriers' to their child increasing their physical activity. However, only just over a third (37%) reported 'no barriers' for themselves as a parent/carer.

The top child–related barriers provide insight into why some children may not participate in physical activity. Of particular note is that the top three barriers included not enough time, not liking physical activity and the child being 'too lazy'. As physical activity participation in some shape or form is accessible to all children (e.g., Active play, walking), it appears more likely that children reporting such barriers may not enjoy or be prioritising physical activity. Some barriers may also highlight why certain children do not enjoy activity. In particular, further research with children may also help identify whether fear of participation or other psychological factors (e.g., feeling unfit, embarrassed etc.) may impact participation.

For parents/carers, in contrast, the key barriers primarily related to a lack of time and being committed elsewhere (e.g., work, caring for other children). Transport, having the time to travel and associated activity costs were also reported as other key barriers.

Such findings may highlight the need to explore how physical activities could be made more accessible to Queensland families and children. There is undoubtedly a diverse range of opportunities for physical activity in most communities, however, many local opportunities may not be accessed, may not be known to parents/carers and some parents/carers may feel that they have to travel too far to reach activities.

On this basis, research highlights the need to promote and deliver activities that are as close as possible to where children live or go to school to avoid parents/carers facing time and travel pressures.

As this study shows that parents/carers are currently travelling an average of approximately 31 km return to take their children to Sport and nearly 35km return to Recreational activities, such travel distances may explain why some children currently cannot easily access physical activities. As some children may be less motivated or have lower skills in devising their own activities, this also highlights a future area for further research (e.g., could educational programs build children's capacity to identify and participate in their own activities).

Importance of developing children's physical literacy as a long term strategy to sustain physical activity

An interesting finding of the current study was that children in the lowest tercile (third) of physical activity in Queensland tended to have lower physical literacy. This relates to a child's overall confidence in physical movement and their understanding of the importance of physical activity.

While some level of socially desirable responding by parents/carers will undoubtedly have resulted in the relatively small difference between the low, medium and high physical activity segments, the difference was still statistically significant in three areas.

Parents/carers of low physical activity children reported that their child:

- Was less confident in physical movement
- Had a lower understanding of the importance of physical activity and;
- Had less parent/carer encouragement to engage in physical activity.

This may highlight that children with low physical activity dislike physical activity (their top reported participation barrier) because they have not had sufficient past experience in physical activity to feel confident trying new activities.

This can also be a vicious cycle, where children become increasingly self–conscious and fearful of trying new activities out of concern that they may look uncoordinated or unfit in front of peers. Accordingly, this could be a topic for future research attention. There may also be a cohort in the low physical activity segment that is simply disinterested in physical activity and lacks motivation to try or pursue regular activity.

While 'laziness' is offered by parents/carers as a participation barrier of this segment, it is also quite possible that low confidence in part explains why such children do not take part in physical activity. It appears less to be due to activity preferences, as low participation children don't seem to enjoy any physical activities.

Indeed, they participate less frequently in all reported activities.

This also highlights why it is critically important to get children involved in a regular physical activity they enjoy. If children do not develop fundamental skills in physical movement from an early age, many may not engage in physical activity as adults and may become at–risk for a myriad of metabolic diseases. Laaksonen et al (2002), in particular, found that males with low leisure time physical activity were more likely to develop metabolic conditions.

In addition, regular physical activity is a well–established protective factor in the prevention and treatment of noncommunicable diseases. Recently summarised in a World Health Organisation Physical Activity for Health discussion paper (2018), these include heart disease, stroke, diabetes and cancer (e.g., breast and colon cancer) (WHO, 2010). Physical activity has similarly been found to contribute to the prevention of risk factors such as hypertension and obesity and has been found to contribute to improved mental health and wellbeing (e.g., Schuch et al, 2013; Das and Horton, 2012).

Accordingly, this highlights the high value of future strategies and programs to improve physical literacy in Queensland children.

There is potential for Queensland schools to be more involved in facilitating children's involvement in out of school hours physical activity

The main location of the three most frequent activities outside school hours was reported in the survey. Interestingly, however, this highlighted that many physical activities outside school hours were generally not organised by schools.

For instance, while parents/carers reported that 11% of Sport participation was school–organised (an area where schools excel), there was relatively much lower school involvement in the organisation of children's Walking activities (only 0.2% of participation), Active transport activities (only 0.1% of participation), General exercise and fitness activities (5.2% of participation) and Recreational activities (5.6% of participation).

Such findings may highlight the potential to encourage schools to be more involved in organising or facilitating more diverse types of physical activities in school aged children. Given the parent/carer barrier of time, there may also be scope to explore delivery of such programs by afterschool child care services or through other afterschool programs. Even having parent/carer activities, together with children's activities, could be explored.

Schools also have the added advantage of being able to target programs to children known to have low physical activity participation or to children with parents/carers unable to take them to physical activity (e.g., Single parent families, shift worker parents/carers etc.).

Other more local models of physical activity delivery could also be worthy of exploration. For instance, while it would require further research, if parents/carers were unable to travel, it may potentially be useful to have afterschool drop–in physical activity programs in major suburbs to allow children to flexibly participate in physical activity outside school hours.

If delivered locally, such programs may also allow older children to walk to services or require parents/carers minimal travel time (e.g., 5–10min) to transport their child to a local site. In this respect, given children's general interest in Active play, Cycling and scootering, General exercise and fitness activities and Sport, there may be great interest in having such activities delivered at a local level.

In metropolitan locations, there is typically significant infrastructure available in local schools, parks and fitness centres that could be utilised for this purpose. With children's relatively low participation in recreational activities, such centres could potentially be a focus for 'come and try' days to trial new activities. Accordingly, there may be potential to explore ways to use local infrastructure to deliver more locally–based physical activities for children.

However, given that low physical activity children often dislike or aren't particularly interested in physical activity, there would be also a need to work collaboratively with schools, Non–Government Organisations (NGO), private providers and youth organisations to 'outreach' to such children. This may help lead children into an activity they enjoy from a young age enabling their continual participation in the activity throughout middle and senior schooling (where activity levels tend to drop).

While the current study is only cross–sectional in nature, data provide some level of insight into ages that may be associated with decline in physical activity or increasing barriers to participation. This provides some insight into the ages when it may be appropriate to encourage children to either continue their physical activity or commence new activities.

Similarly, strategies to address barriers could also be implemented as children age. For instance, as time and commitment pressures were much higher for older than younger children, this may signal the potential to develop early intervention strategies to encourage older children to either start a new activity or continue their existing activities. For instance, there may be value in working on children's physical literacy before 'participation fear' peaks and before body image issues/fear of judgement occur.

Such findings further highlight the importance of Queensland schools in helping identify children with low levels of physical literacy and supporting such children with early intervention strategies.

This is also supported by other research. In particular, findings of research by Sallis et al (2000) have identified that early exposure of children to physical activity is positively correlated with the likelihood of children maintaining an active lifestyle during adolescence and adulthood.

While there is currently no internationally accepted definition of physical literacy, Whitehead (2010) argues that it should be viewed as more than just about physical performance.

Whitehead (2010) conceptualised physical literacy as **– The motivation, confidence, physical competence, knowledge and understanding to maintain physical activity throughout the life course** (Whitehead, 2010; p11).

Accordingly, this may highlight the potential value of developing children's physical literacy from both a physical competence and cognitive perspective to ensure that Queensland children:

- Understand the importance of being physically active
- Gain sufficient experience in physical and exercise movements to confidently take part in activities (e.g., knowing how to throw, kick or hit a ball, knowing exercises for different parts of the body) and to understand the effects of physical activity (e.g., knowing that sore muscles are normal after exercise)
- Develop a growth mindset in relation to learning physical activities (e.g., knowing that continued practice will get everyone better at a sport or exercise and fitness activities)
- Enjoy and gain satisfaction from participation and involvement in physical activity
- Prioritise physical activity and know how to balance screen time and sedentary behaviour
- Are encouraged to identify at least one and preferably more than one type of physical activity that they are prepared to do regularly from adolescence through to adulthood

In this regard, even holding discussions with children in schools and with parents/carers to encourage thinking about such topics could be of great value. It could also be argued that physical activity participation requires a range of significant cognitive changes in non–participants that are likely to follow models of behavioural change.

According to Prochaska and DiClemente's (1982) Transtheoretical model, behavioural changes progresses from pre–contemplation, to contemplation and finally to action and maintenance of behaviours. Maintenance strategies also come into play, where a child may be made more resilient to dealing with setbacks and barriers that present during their life with regards to maintaining physical activity (e.g., getting back after illness or injury, after a holiday etc.).

Accordingly, there is potential to design and implement strategies to assist children to start thinking about their physical activity participation, as well as encouraging their participation in physical activity programs. Children could importantly be encouraged to not only find a physical activity that interests them, but also be encouraged to think about why it is important for children to have an activity through adulthood and be aware of periods in life when children tend to decrease their involvement in physical activity (e.g., early adolescence).

Designing and implementing such strategies may help support the involvement of both children and adults in physical activity across their lifetime, and for this reason, has great potential to contribute to improving children's health and wellbeing in Queensland.