



# IS SPORT ENOUGH?



**ACTIVE HEALTHY KIDS  
AUSTRALIA**

The National Heart Foundation of Australia is the primary strategic and endorsing partner of Active Healthy Kids Australia, assisting in the development and communication of the *2014 Active Healthy Kids Australia Report Card on Physical Activity for Children and Young People*.



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## WHAT IS THE 'PHYSICAL ACTIVITY REPORT CARD' AND HOW CAN IT HELP?

The Physical Activity Report Card initiative was first developed and produced by Active Healthy Kids Canada in 2005, with an updated Report Card released annually for the past decade. The Physical Activity Report Card is a translation of knowledge, which provides the best synthesis of available evidence regarding the physical activity and sedentary behaviours of children and young people, and the settings/influences and strategies/investments which have a potential impact on these behaviours'. Since its inception the Canadian Report Card has become the 'go to' document for informing policy changes, advocating for increased physical activity amongst Canadian children and young people and encouraging the nation to 'power the movement to get kids moving'.

This is Australia's first Physical Activity Report Card and it has been modeled on the Canadian Reports. The Australian Research Working Group (RWG) hopes to, like the Canadian initiative, release a Report Card annually so that Australia is informed and updated on the physical activity and sedentary behaviours of its children and young people. It is anticipated that the Australian Report Card initiative will be at the forefront of physical activity advocacy: informing policy changes and environmental decision-making in health services to increase physical activity participation; highlighting where more research is needed to better understand physical activity behaviours of Australian children and young people; and encouraging all Australians to make changes in their lives to promote, facilitate and model positive lifestyle behaviours with the hope of increasing physical activity participation and reducing sedentary behaviours among the children and young people of today and tomorrow.

# WHY IS IT IMPORTANT FOR CHILDREN TO BE PHYSICALLY ACTIVE?

Daily physical activity is vital for all Australian children and young people. The Australian physical activity guidelines provide clear recommendations for the minimum amount of physical activity required by children and young people to experience health benefits<sup>2</sup>. Children and young people who accumulate the minimum amount of physical activity every day are at a lower risk of conditions including overweight or obesity, Type II diabetes, metabolic syndrome and other comorbidities, are more likely to see improvements in their aerobic fitness and bone health and experience positive mental health benefits<sup>3-5</sup>. Despite these obvious health benefits, only 19% of Australian children and young people, aged 5-17 years meet the physical activity recommendations<sup>6</sup>.

# HOW MUCH PHYSICAL ACTIVITY IS ENOUGH?

The Australian Government Department of Health and Ageing recently updated the recommended physical activity and sedentary behaviours guidelines for infants (Birth to 1 year), toddlers (1-3 years), pre-schoolers (3-5 years), children (5-12 years) and young people (13-17 years)<sup>2</sup>. A summary of these guidelines is shown in Table 1.

**Table 1. Summary of the recommended Australian physical activity and sedentary behaviour guidelines for children and young people<sup>2</sup>.**

Age group	Physical activity recommendations	Sedentary behaviour and screen time * recommendations
<b>Infants (Birth to 1 year)</b>	Physical activity should be encouraged from birth, especially supervised floor-based play.	Children (0-5 years) should not be sedentary, restrained or kept inactive for more than 1 hour at a time, with the exception of sleeping.
<b>Toddlers (1-3 years) &amp; Pre-Schoolers (3-5 years)</b>	Toddlers and pre-schoolers should accumulate at least 3 hours of physical activity (light, moderate or vigorous) every day.	Children (less than 2 years) should not take part in any screen time* activities.  Children (2-5 years) should be limited to less than one hour per day of screen time*.
<b>Children (5-12 years) &amp; Young People (13-17 years)</b>	Children and young people should accumulate at least 60 minutes of moderate <sup>#</sup> to vigorous <sup>^</sup> intensity physical activity every day.  A variety of aerobic activities should be undertaken, including some physical activities that are vigorous <sup>^</sup> in intensity.  Physical activities that strengthen muscles and bones should be included on at least three days per week.  For additional health benefits, children and young people should engage in more physical activity (up to several hours) every day.	Children (5-12 years) and young people (13-17 years) should minimise the time spent being sedentary every day and break up long periods of sitting as much as possible.  Children (5-12 years) and young people (13-17 years) should limit their screen time* to no more than 2 hours per day.

\* Screen time refers to time spent using electronic media such as television, seated electronic games, portable electronic devices or computers for entertainment.

<sup>#</sup> Moderate intensity physical activity requires some effort but children and young people should still be able to speak easily (e.g. brisk walking, active play, riding a bike or scooter).

<sup>^</sup> Vigorous intensity physical activity requires more effort and should make children and young people breathe harder and faster ("huff and puff") when participating (e.g. running, playing sport).

## 'IS SPORT ENOUGH?'

## How many young Australians play sport?

Australia is a sporting nation and sport is an integral part of our national identity, which is reflected in the large number (64-85%)<sup>6-9</sup> of Australian children and young people who participate in some form of organised sport or physical activity<sup>7-9</sup>. However, despite these participation rates, participation in other forms of physical activity (e.g. active transport, leisure time physical activity) that also contribute to overall physical activity levels are low and declining.

Likewise, many Australian children and young people, even those who participate in sport and meet physical activity guidelines, are engaging in levels of recreational electronic screen use and other sedentary behaviours that are likely to adversely affect their health, growth and development<sup>10-18</sup>.

And so while it is encouraging that a large number of children are obtaining some of their weekly physical activity from organised sport, we need to ask 'Is sport enough?'. If we look at overall physical activity levels as well as physical fitness and obesity levels, then the answer is clearly no.

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## Benefits of sport participation

Participation in sport provides a wide range of benefits to children and young people that go beyond physical fitness alone<sup>19, 20</sup>. When they play sport, children are engaged with others and learn teamwork and negotiation skills; they develop self-discipline; they learn to work within the rules, regulations and etiquette of a social system; they develop decision-making skills; and they cumulatively acquire transferable motor skills, giving them a sense of movement competence and confidence.

## How active are young Australians while playing sport?

It is important to understand that participation in sport does not necessarily mean that children and young people meet the recommended levels of physical activity, or that everyone has an equal exposure to sport.

Participation during a typical week, for most sporting commitments (which may only last for half of the year depending on the sport being played), will involve one or two training sessions and one competitive game. This equates to anywhere from three to six hours (approximately) per week of scheduled time for physical activity.

During this time each week parents, coaches, club administrators, school staff and event organisers need to be aware of how much of this time children are being physically active. For example, during sports training many youngsters may spend a lot of time listening to instructions, waiting for a turn and standing around learning new skills or game tactics with the actual time on task and the intensity of the activity being minimal. It has been shown that less than 50% of time spent in organised sport is spent in moderate to vigorous physical activity (MVPA)<sup>21</sup>.

How can we increase physical activity levels through sport and other domains?

As a nation we need to make sure that we continually encourage our children and young people to actively participate in organised sport as it provides them with an outlet to be active and to acquire a host of physical, cognitive and social-emotional skills and related benefits. These sports need not necessarily be competitive in nature, as competition may be discouraging for some children. We also need to ensure that the quality (intensity of activity) and quantity of activity is adequate.

In addition, it is imperative that we encourage, support and facilitate the incorporation of more physical activity throughout their everyday activities such as using active transport to and from school, sporting commitments or social engagements; providing opportunities to be active both indoors and outdoors in an unstructured environment at both school and home; participating in household chores where appropriate (e.g. gardening) and breaking up long periods of time that they are sedentary which includes limiting the amount of time that children and young people are engaged in electronic media (e.g. watching television, playing computer games). ***The broad message is: Sport is not enough.***



# METHODOLOGY AND DATA SOURCES USED

The Active Healthy Kids Australia Physical Activity Report Card for Children and Young People was developed using synthesised data from a number of national and state-based surveys. Only surveys conducted since 2008 were considered to assure recency. These surveys have assessed outcomes focused on the physical activity or sedentary behaviours of children and young people, or the settings and influences that impact on physical activity participation. While all available data were sourced, it was decided that the grades assigned to each indicator would be based highly on national datasets with state-based data referred to and used within the Report Card to illustrate and inform specific discussion points and research gaps. This extensive synthesis of literature ensures that the Report Card is based on the best available evidence regarding the overall physical activity participation levels of Australian children and young people.

A RWG was established that consisted of a number of experts in the field of youth physical activity and health from across the nation. The RWG first discussed which indicators should be included in the Report Card (indicators focusing on behaviours, settings and influences, and government strategies and investments were included), which metrics should be used to assess each indicator and the benchmarks used to determine cut-offs that would be the basis of the grades allocated:

**A** = Australia is succeeding with a majority of children and young people (81-100%);

**B** = Australia is succeeding with well over half of children and young people (61-80%);

**C** = Australia is succeeding with about half of children and young people (41-60%);

**D** = Australia is succeeding with some but less than half of children and young people (21-40%);

**F** = Australia is succeeding with very few children and young people (0-20%); or

**Incomplete (INC)** = Not enough available evidence to assign a grade to the indicator.

The synthesised data were then evaluated by the RWG based on pre-determined weighting criteria (e.g. representativeness, recency, and quality of the measurements used) and then purposeful discussions were conducted to determine what grades should be assigned to each indicator based upon the specific benchmarks established, with consideration given to disparities between specific sub-groups (e.g. gender, age, socioeconomic status) and changes over time. Table 2 lists each of the primary data sources used to inform the grades assigned to each indicator and describes specific survey characteristics.

**Table 2. Description of each of the primary data sources used to inform each of the grades.**

Name of survey	Survey type	Year /s data collected	Sampling method	Description (national / state-based)	n	ages	Indicators informed
ABS Australian Health Survey <sup>6</sup>	Cross-sectional	2011/12	Stratified multistage area sample of private dwellings.	National	2,718*	2-17 yrs	1, 2, 4, 5, 6, 7
ABS Children's Participation in Sport and Leisure Time Activities <sup>7</sup>	Cross-sectional	2012	Stratified multistage area sample of private dwellings.	National	1,849 <sup>#</sup>	5-14 yrs	2
LSAC <sup>8</sup>	Longitudinal	2009/10 (Waves 3.5 & 4)	Two-stage clustered sample design (postcodes from Medicare database).	National	8,396	6-7 & 11-12 yrs	2, 5, 7, 8, 9
NaSSDA Survey <sup>9</sup>	Cross-sectional	2009/10	Stratified two-stage probability design (schools and classes).	National	12,188	12-17 yrs	1, 2, 3, 5, 6, 7, 8, 9
SPANS <sup>22</sup>	Cross-sectional	2010	Two-stage stratified cluster design (schools and classes).	State-based (NSW)	8,058	5-16 yrs	8, 11, 12

*Note, All surveys provided data on males and females. 1 = Overall PA Levels, 2 = Organised Sport and PA Participation, 3 = Physical Education and PA Participation in Schools, 4 = Active Play, 5 = Active Transportation, 6 = Sedentary Behaviours, 7 = Family and Peers, 8 = School, 9 = Community and the Built Environment, 10 = Government Strategies and Investments, 11 = Aerobic Fitness, 12 = Movement Skills, ABS = Australian Bureau of Statistics, LSAC = Longitudinal Study of Australian Children, NaSSDA = National Secondary Students' Diet and Activity, PA = Physical Activity, SPANS = Schools Physical Activity and Nutrition Survey.*

*\* Sample size from the National Nutrition and Physical Activity Survey (NNPAS) arm of the National Australian Health Survey, as all variables used in the Report Card were collected via this arm.*

*<sup>#</sup> n is an estimate of the total number of Australian children/young people ('000) represented by the survey.*



# INDICATORS

A total of 12 indicators were included in the 2014 Active Healthy Kids Australia Physical Activity Report Card all of which were grouped under four categories: Strategies and Investments (Government Strategies and Investments), Settings and Sources of Influence (Family and Peers, School and Community and the Built Environment), Physical Activity Behaviours that contribute to Overall Physical Activity Levels (Organised Sport and Physical Activity Participation, Physical Education and Physical Activity Participation in Schools, Active Play, Active Transportation and Sedentary Behaviours) and Traits (Aerobic Fitness and Movement Skills) (see Figure 1).

The following sections examine each of the 12 indicators, the grades that were allocated to each, and how the grades were allocated. Within each section, the following sub-sections will be used to examine each indicator:

**GRADE ASSIGNMENT BOX** – this shows the grade that was allocated to each indicator and lists each of the core metrics used to assign each grade.

**RATIONALE** – this section briefly describes how and why the assigned grade was allocated based on the evidence assessed.

**KEY FINDINGS** – this section highlights the key findings that informed the grade for each of the core metrics and for some secondary metrics.

**HOW CAN WE IMPROVE THE GRADE?** – this section provides recommendations for ‘calls to action’ to improve the grade in the future and where possible specific examples of what should be done are provided. The recommendations have been defined as ‘supported by research’ or ‘additional recommendations’, which resulted from discussions among the RWG.

**WHAT DO WE NEED TO KNOW?** – this section lists obvious research gaps that have been highlighted by the Report Card findings. It also looks at what research is needed in the future to better inform the grade.

**WHAT DO WE NEED TO DO?** – this section suggests standardised questions/methodologies and core metrics that should be employed by potential research endeavors examining outcomes relating to specific indicators. These suggestions are based upon current data, however suggestions for future data that will help to ensure greater resolution and better estimates are also reported.

**BEYOND THE GRADE** – this section reports on information that did not necessarily inform each grade but does provide an interesting perspective on aspects that may affect each indicator.

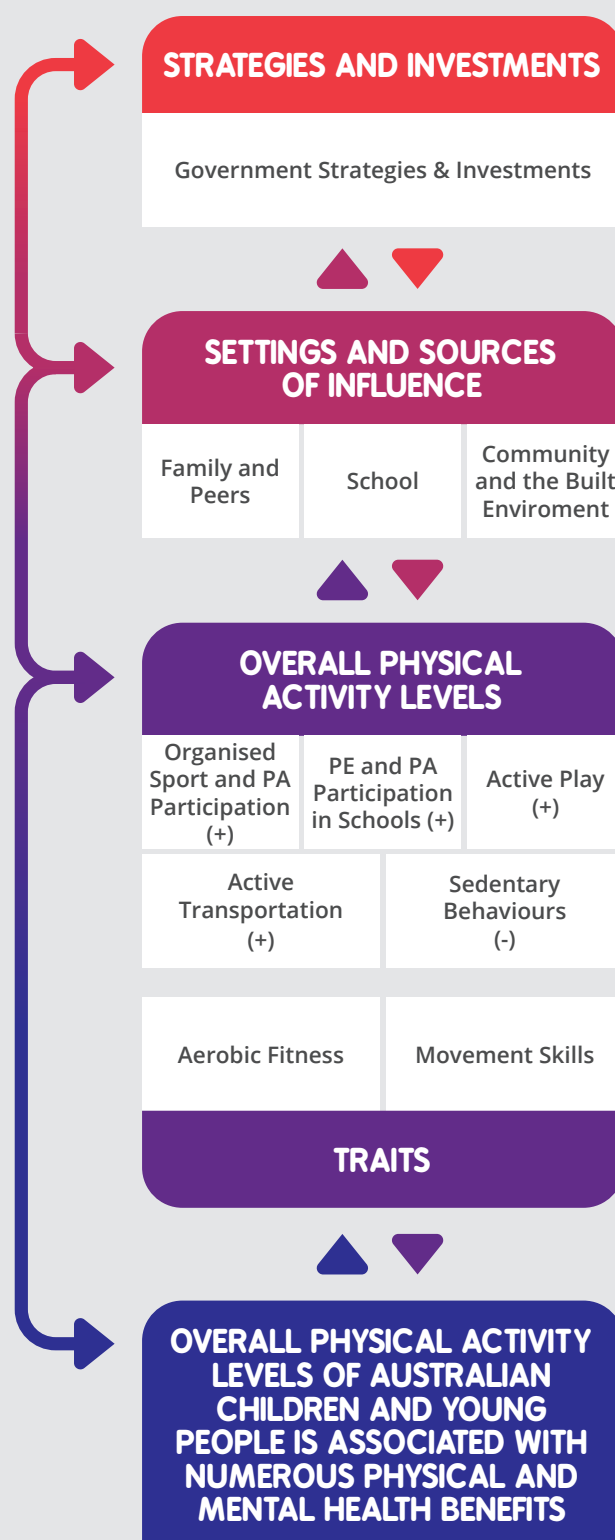


Figure 1.

Visual representation of the indicator categories. Adapted from the 2013 Active Healthy Kids Canada Physical Activity Report Card<sup>23</sup>. Note, + = increases PA levels, - = decreases PA levels, PA = Physical Activity.

# OVERALL PHYSICAL ACTIVITY LEVELS D-

Proportion of Australian children and young people meeting the recommended Australian physical activity guidelines: children aged 2-4 years should accumulate at least 180 minutes of activity every day and children and young people aged 5-17 years should accumulate at least 60 minutes of MVPA on a daily basis<sup>2</sup>.

## Rationale / Overview

The majority of Australian children and young people are not meeting the daily Australian physical activity guidelines. This grade reflects the synthesis of one group who is doing reasonably well (2-4 year olds) and one group who is doing very poorly (5-17 year olds).

## Key Findings

- + 19% of Australians aged 5-17 years<sup>6</sup> and 15% of Australians aged 12-17 years<sup>9</sup>, meet the recommended Australian physical activity guidelines<sup>2</sup> of accumulating at least 60 minutes of MVPA every day of the week.
- + On average, Australians aged 5-17 years, meet the Australian physical activity guidelines on 4 days of every week<sup>6</sup>.
- + 17% of Australians aged 5-17 years are accumulating at least 12,000 steps per day<sup>6</sup>. It has been reported that 60 minutes of MVPA per day can be approximated to 12,000 steps per day for children and young people<sup>24</sup>.
- + On average, Australians aged 5-17 years take 9,140 steps each day<sup>6</sup>.
- + 72% of Australian parents report that their children aged 2-4 years meet the recommended Australian physical activity guidelines<sup>2</sup> by accumulating at least 180 minutes of physical activity each day<sup>6</sup>.
- + On average, parents report that Australian children aged 2-4 years meet the Australian physical activity guidelines on 6 days of every week<sup>6</sup>.

## How can we improve the grade?

### Supported by research

- + Greater public awareness of the physical activity guidelines is needed. Not only do the guidelines need to be widely disseminated through a number of avenues (e.g. social media, public healthcare etc.) but 'individualised physical activity suggestions' and 'family problem solving for physical activity' are ways to ensure all Australians

are equipped with a number of strategies to meet the guidelines<sup>4</sup>.

- + It is important that there be a focus on all the benefits accrued to children if they are physically active not just on weight management, such as improved aerobic fitness, mental health, cognitive function and academic achievement and cardiometabolic health<sup>3-5</sup>.

### Additional recommendations

- + Children, their parents and other influential people in their lives, need to be aware of how the daily routine of Australian children and young people can be altered to allow more physical activity to be embedded throughout the entire day. This could be in the form of active transportation, free play, family-orientated physical activity and everyday incidental activity (e.g. chores).

### What do we need to know?

- + It is imperative that nationally representative physical activity data (objective and subjective), for all Australian children and young people, be available as part of a continual collection process with a standardised set of methodologies/questions. It is important that the numerous monitoring systems (surveys) already in place are consolidated with one another such that the same measures are employed.
- + There is a need for 24 hour monitoring of physical activity to determine potential compensatory effects on behaviour (e.g. if children participate in sporting competition during the morning, do they compensate by participating in only sedentary activities for the rest of the day?)<sup>25</sup>.
- + A better understanding of what it is about specific physical activities (e.g. walking around their local community, maintaining involvement with specific leisure pursuits) that motivates and encourages children to engage.

## What do we need to do?

### How to collect the data

Given the complex nature of physical activity it is important that both objective and subjective measurements be built into the regular national collection cycle. Objectively, standardised data collection and analysis protocols should be used for various measurement tools (accelerometers, pedometers and in the future multi-sensor devices), such that:

**Children are monitored for a 7-day period<sup>26</sup> and researchers report their activity time (e.g. minutes MVPA and light physical activity) and/or step counts for each of the 7 days.**

The proposed self-report question that should be employed is: **Over the past 7 days, on how many days were you/your child engaged in MVPA (activity that increases heart rate and gets you/your child out of breath some of**

**the time) for at least 60 minutes (can be accumulated over the entire day, e.g. bouts of 10 minutes) each day?**

### How to operationalise the core metric

Depending on how compliance with physical activity guidelines is operationalised (i.e. at least 60 minutes EVERY day, on MOST days or for 60 minutes ON AVERAGE over the week), very different estimates of compliance are reported<sup>27</sup>. However, to be consistent with the current Australian recommended physical activity guidelines, the two core metrics proposed for Overall Physical Activity Levels are:

1. **Proportion of Australian children and young people meeting the recommended physical activity guidelines\* every day; and**

2. **Proportion of days (during the past 7 days) that Australian children and young people meet the recommended physical activity guidelines\*.**

*\*at least 180 minutes of physical activity (2-4 years)/60 minutes of MVPA (5-17 years) every day OR if pedometers are used at least 12,000 steps every day.*

### Physical activity guideline development

As we build up substantial Australian and international databases of objective measures of physical activity coupled with health outcomes or evidence from experimental and longitudinal studies, we need to revise the guidelines according to the new dose-response relationships. This should occur in a timely fashion as data become available.

## BEYOND THE GRADE

### How children spend their active time

The 2007 National Children's Nutrition and Physical Activity Survey<sup>28</sup> provides a good picture of the make-up of the physical activity and energy expended by Australian children and young people. Children spend 42% of their physically active time in free play (non-organised activities like playground games), 34% playing sport, 15% cycling and walking, and the remaining 9% in other activities, mainly chores.

The 'Big Five' sports, in order, are: soccer, Australian Rules, dance, basketball, and netball. Sports also have specific identities according to the type of families that participate. The 'wealthiest' sport is swimming, and the 'poorest' sports are basketball and Rugby League. Rugby League is the most masculine sport in terms of participants, and netball and dance the most feminine<sup>29</sup>.

In terms of energy expenditure, 29% of all the energy children use is expended being physically active – roughly 2,500-3,000 kJ. Children expend 45% of their activity energy budget playing sport, despite sport constituting only 34% of their time<sup>28</sup> (see figure 2). This is because the average intensity of sport is higher than other types of physical activity. Free play uses up 39% of children's activity energy, walking and cycling 12%, and chores a mere 4% (see figure 2).

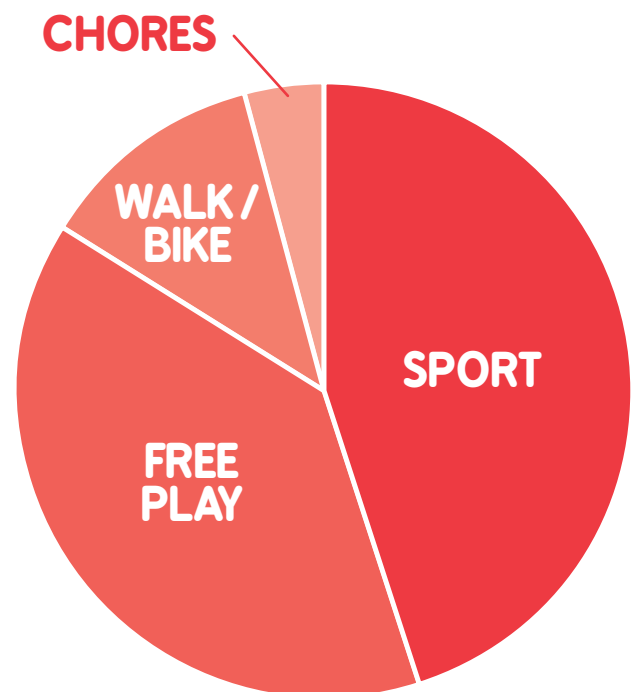


Figure 2.

Proportion of energy expended by Australian children and young people spend in different types of physical activity – 2007 National Children's Nutrition and Physical Activity Survey<sup>28</sup>.



# ORGANISED SPORT AND PHYSICAL ACTIVITY PARTICIPATION

## B-

Proportion of Australian children and young people who participate in organised sport and/or physical activity programs.

### Rationale

Participation in organised sport and/or physical activity programs amongst Australian children and young people is higher, relative to the other physical activity behaviours addressed in the Report Card. The grade reflects a synthesis of the range of participation rates reported (64% to 85%), but also the lack of resolution for those higher participation rates (participation is often measured only over the past 12 months or during summer/winter school terms).

### Key Findings

- + 64% of Australians aged 5-17 years participated in organised sport or physical activity over the past 7 days<sup>6</sup>.
- + 66% of Australians aged 5-14 years participated in organised sport over the past 12 months<sup>7</sup>.
- + 85% of Australians aged 12-17 years participated in organised sport or physical activity during summer and/or winter school terms, both in and outside of school<sup>9</sup>.
- + 74% and 79% of Australians, aged 6-7 and 11-12 years respectively, participated in organised sport over the past 12 months<sup>8</sup>.

### How can we improve the grade?

#### Additional recommendations

- + Ensure all Australian children and young people are aware of the range of, and are encouraged to participate in organised sport and physical activities, promoting equitable access and opportunities of provision for all (e.g. by reducing the cost of sports and activities through specific subsidies, providing pathways to community sport from schools and teachers).

- + Coaches/clubs and parents should encourage the continuation of sport participation and effective strategies should be put into place to minimise dropouts from sport.
- + Coaches and sporting organisations should ensure that their games and activities provide maximum opportunities for movement for children. This may be achieved through session planning and coach education programs. It can be hoped that by doing so participation levels and retention rates increase as a result of higher enjoyment levels.

### What do we need to know?

- + While participation rates are high, little is known regarding the 'quality' (intensity of activity and amount of time being active) of organised sport and levels of physical participation during games and training sessions. Further research into how active Australian children and young people are when engaged in organised activities is required.
- + Longitudinal studies that investigate organised sport and physical activity participation, retention rates and reasons why children and young people participate in or drop-out of sport are needed to better understand yearly participation rates.
- + Studies examining children who do not participate in organised sport, whether these children come from a particular disadvantaged group (such as low socioeconomic status) and how they could be attracted to participate will help develop ways of engaging these children and young people.
- + Whether children participating in organised sport are involved in a single sport or multiple sports. Participation in multiple sports and avoiding early specialisation is beneficial in helping develop a range of motor skills and social interaction<sup>30, 31</sup>.



## What do we need to do?

### How to collect the data

In order to help understand the amount of physical activity actually done and the intensity it is performed at during organised sport participation, it is recommended that: **Accelerometers should be worn and observational data collected while children and young people participate in organised sport (both individual and team sports and for training sessions and competitive games), with researchers reporting time children and young people are active (e.g. time spent in MVPA or light physical activity from both accelerometry and/or observations made).**

In order to have greater resolution when assessing organised sport and physical activity participation, and given the differential effects on health between team and individual sports<sup>19</sup>, the standardised self-report questions to be employed should be:

1. **Have you/has your child participated in organised team sports and/or physical activity (e.g. basketball, football, netball) on a regular basis (1 to 3 times per week for at least 3 months or an entire sporting season) over the past year?;** and

2. **Have you/has your child participated in organised individual sports and/or physical activity (e.g. martial arts, dance) on a regular basis (1 to 3 times per week for at least 3 months or an entire sporting season) over the past year?**

### How to operationalise the core metric

The core metrics used to assess organised sport and physical activity participation should be: **Proportion of Australian children and young people participating in organised team/individual sports and physical activity during the past 12-month period.**

## BEYOND THE GRADE

### Time trends in sports participation

Participation in organised sport provides an opportunity for children and young people to increase their physical activity and develop physical and social skills. Sport contributes to an average of 45% (43 minutes) of MVPA time per day in young Australians<sup>29</sup> with a higher percentage of MVPA time spent in practice sessions than in games (20 vs. 18 min per hour in MVPA respectively)<sup>32</sup>.

But has children's participation in organised sport changed over time? There appears to have been a general trend towards organised sports participation in Australian children and young people in recent years (see Figure 3). Martin and colleagues<sup>33</sup> reported declines in the organised sports participation (defined as club and school sport participation in the previous year) of 10-13 year old South Australians between 1985 and 1997, from 87% to 76% in boys and 80% to 71% in girls.

Another South Australian study on the other hand reported increases from 57% to 68% in the percentage of 9-13 year olds participating in organised sport between 1985 and 2013<sup>34</sup>. Similarly, there have been substantial increases in participation rates in Victoria, which have increased from 52% to 92% in 9-13 year olds over the period 1985-2001<sup>35</sup>. Data from the Australian Bureau of Statistics indicate that the percentage of 5-14 year olds participating in at least one organised sport increased from 64% to 68% between 2000 and 2006<sup>36</sup>.

Similar patterns of change in organised sport participation have generally occurred overseas (see Figure 3). Participation rates increased in: (a) Belgium by 30% (1969-1999)<sup>37</sup>; (b) Iceland by 15% (1992-2006)<sup>38</sup>; and (c) the US by 2% (2000-2006)<sup>39</sup>. In contrast, participation in organised sport declined by 7% between 1995 and 2000 in China (Hong Kong)<sup>40</sup>.

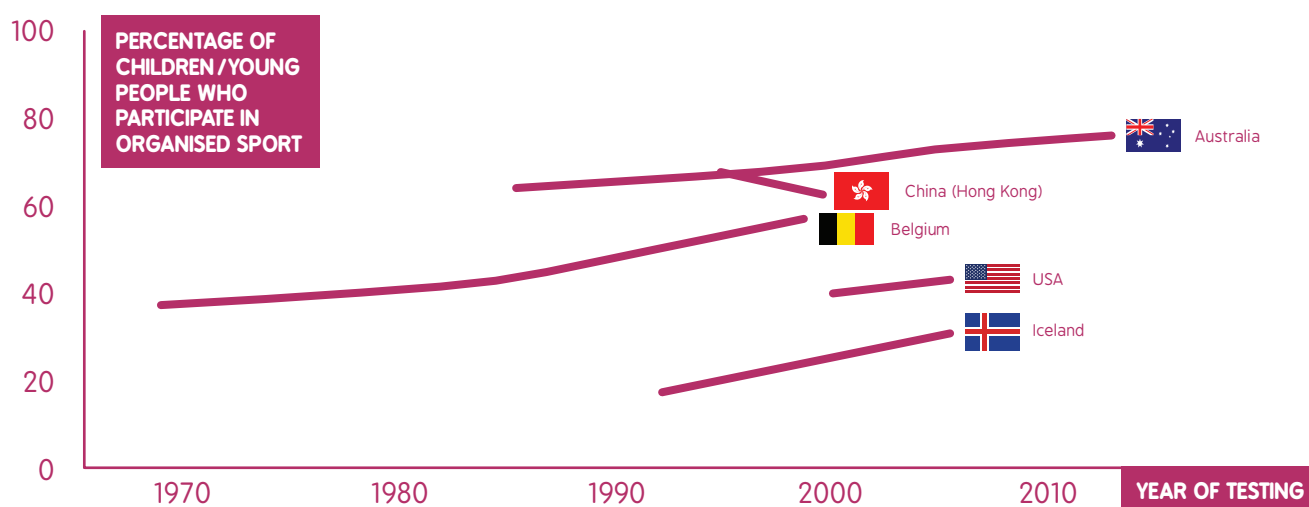


Figure 3.

Time trends in the percentage of children and young people who participate in organised sport.



# PHYSICAL EDUCATION AND PHYSICAL ACTIVITY PARTICIPATION IN SCHOOLS INC

Proportion of Australian children and young people participating in at least 120 minutes per week of physical education\* at school.

*\* Physical Education is defined as 'the part of the school curriculum that aims to educate young people through physical activity. An important aim is to promote the adoption of a physically active lifestyle that persists into adulthood'<sup>41</sup>.*

## Rationale

An Incomplete was assigned for this indicator given the lack of nationally representative data (for physical education participation) for both primary and secondary school children and given no metric for physical activity participation (all school physical activity outside of physical education classes) could be derived due to a lack of data on this component.

## Key Findings

- + 71% of Australian secondary school students (aged 12-17 years) participated in at least 120 minutes of physical education at school per week during both summer and winter school terms<sup>9</sup>.
- + 78% of Australian secondary school students (aged 12-17 years) participated in physical education on two or more days per week during both summer and winter school terms<sup>9</sup>.

## How can we improve the grade?

### Supported by research

- + The quality of physical education needs to be addressed to ensure that both primary and secondary school children and young people are engaged in activity for a large proportion of their physical education class time and to minimise inactive time (e.g. time spent changing, listening to instructions, waiting for a turn etc.)<sup>42-46</sup>.
- + Specialist physical education teachers or teachers with substantial professional support and training should be the sole providers of structured physical education classes at both primary and secondary schools<sup>46, 47</sup>.

- + All teachers (at both primary and secondary schools) should participate in on-going professional learning opportunities to develop their understanding of how to provide physical activity within and beyond the classroom<sup>46</sup>.

## What do we need to know?

- + How much objectively measured MVPA occurs across the school day including physical education lessons, and how engaged are students during this time?
- + What impact does motivation in physical education classes have on leisure time physical activity, which should be examined using long-term studies<sup>48</sup>?
- + What is the impact of school policies on students' physical activity and sedentary behaviour in the school setting<sup>49</sup>?
- + What impact does the school environment have on changes in student physical activity participation?
- + What are feasible ways to incorporate physical activity, including light physical activity, into other classroom time (e.g. active lesson breaks and active learning time)<sup>50-53</sup>?
- + How can we operationalise an effective monitoring and surveillance process so that we may publicly report how much physical education and physical activity is being done throughout schools at a national level? Schools that are falling below where they should be can then be identified and provided with the support they need (e.g. professional development programs, making connections with those schools who are modeling best practice)<sup>46</sup>.





## What do we need to do?

### How to collect the data

To help understand the amount of, and the intensity at which, physical activity is performed during physical education classes (not including school sport) and other unstructured periods (e.g. recess and lunchtime), it is recommended that: **Accelerometers be worn and observational data collected while students (in both primary and secondary schools) participate in scheduled physical education classes and are physically active during other periods throughout the school day, with researchers reporting the amount of time they are active (e.g. time spent in MVPA or light physical activity from both accelerometry and/or observations made).**

The standardised self-report questions that should be employed for primary and secondary students, with regard to physical education participation, are:

1. **How many physical education sessions/classes do you have every week (count double lessons as 2 sessions/classes), not including school sport?;** and
2. **How long do each of the physical education classes/sessions go for?**

In order to gauge how active students are outside of scheduled physical education times (i.e. during recess and lunchtime) the suggested standardised self-report questions that should be employed are:

1. **What do you usually do\* during recess time?;** and
2. **What do you usually do\* during lunchtime?**

*\*Because students would be required to write down what they usually do, these activities could be categorised as 'active' (walking or vigorous activities) or 'sedentary' (lying, sitting or standing activities)<sup>54</sup>.*

### How to operationalise the core metric

Until more is understood about how much physical activity is actually performed during scheduled physical education sessions/classes and the intensity at which it is performed, the core metrics used to assess physical education and physical activity participation in schools should be:

1. **Proportion of Australian children and young people who participate in at least 2 sessions/classes of physical education (not including school sport) every week;**
2. **Proportion of Australian children and young people who participate in at least 120 minutes of physical education (not including school sport) every week; and**
3. **Proportion of Australian children and young people who are active# during recess/lunchtime.**

*#'Active' defined as walking or vigorous activities (see above)<sup>54</sup>.*

## BEYOND THE GRADE

### Time trends in school physical education

Physical education has the potential to provide children and young people with an opportunity to accumulate physical activity at school. For example, US data shows that approximately 12 minutes of MVPA is accumulated during a typical 30-minute physical education lesson<sup>21</sup> which is consistent with UK data showing that children and young people spend approximately one third of their physical education lesson in MVPA<sup>43</sup>.

Participation in school-based physical education has declined somewhat in Australian children and young people since the mid-1980s (see Figure 4). A South Australian study showed that the percentage of 9-15 year olds who participated in physical education on one or more days a week declined by 8% (from 99% to 91%) between 1985 and 2004<sup>55</sup>.

Smaller declines were reported by Booth<sup>34</sup> who reported a 4% decline in 9-13 year old South Australians between 1985 and 2013 and by Salmon and colleagues<sup>35</sup> who reported a 3% decline in 9-13 year old Victorians between 1985 and 2001. Similarly, participation in physical education in young Canadians (Grades 9-12) declined by 10% over a 6-year period from 1999 to 2005<sup>56</sup> — a rate of decline much greater than that observed in Australia. In contrast, the percentage of US children enrolled in physical education on one or more days a week increased by 6-8% from 1991 to 2003 (see Figure 4), as too did the percentage of children who exercised or played sports for at least 20 min during physical education, although there was a decline in daily physical education participation<sup>57</sup>.

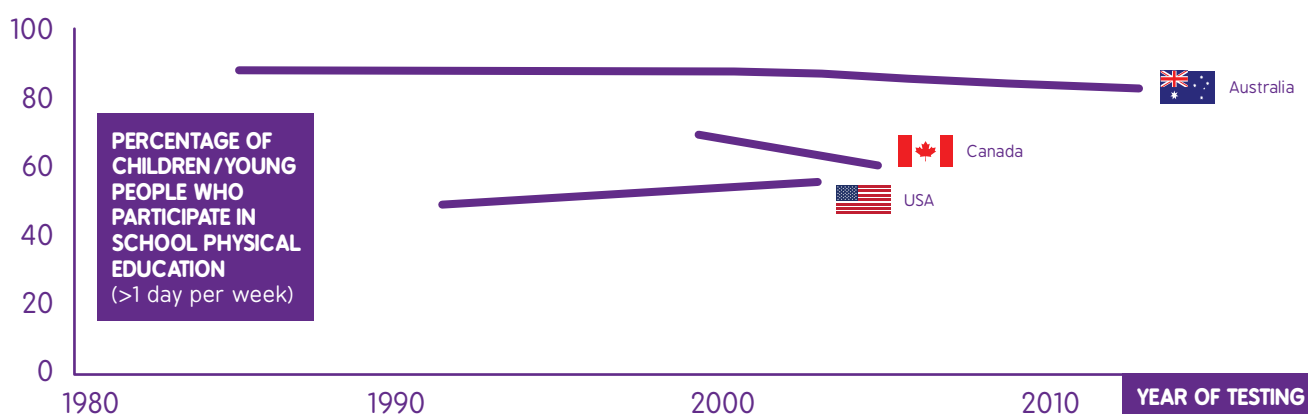


Figure 4.

Time trends in the percentage of children and young people who participate in school physical education on one or more days of the week.

No consensus on a core metric could be reached.

## Rationale

An Incomplete was assigned to this indicator given there are no clear guidelines regarding how much active play (or non-organised physical activity) children should be aiming to accumulate, and there is no clear operationalisation of active play.

## Key Findings

- + According to parents, 78% of Australians aged 5-17 years participated in non-organised physical activity over the past week<sup>6</sup>.
- + Participation in non-organised physical activity rapidly reduced with age (5-8 years: 91%; 9-11 years: 90%; 12-14 years: 72%; and 15-17 years: 54%)<sup>6</sup>.
- + According to parents, Australians aged 2-4 years play outdoors an average of 174 minutes every day<sup>6</sup>.

## How can we improve the grade?

### Supported by research

- + Given children can play almost anywhere, and that free play forms an integral part of childhood development and learning, parents and those engaged in the childhood sectors should be supported to provide children with plenty of opportunities for non-structured play, and to encourage children to spend time outdoors where children and young people are afforded many opportunities to engage in 'active play'<sup>58</sup>.

## Additional recommendations

- + Australian children and young people need to be stimulated and allowed to explore the various ways they can be active, not including organised and structured activities that they typically have no control over.

## What do we need to know?

- + There needs to be a consensus reached on how to define and operationalise the concept of active play. The lack of a clear definition has resulted in a lack of research in this area and the collection of inconsistent data. Thus we are currently unable to accurately capture how much 'active play' children are engaging in.
- + Research looking at the different types of 'non-organised' activities Australian children of different ages are engaged in, the settings in which they occur and the different activity intensities involved is required if we are to understand 'active play' better.

## What do we need to do?

### How to collect the data

First and foremost a clear definition of 'active play' is needed so that guidelines and recommendations around how much children should be doing can be established. Objective physical activity data are needed for a better understanding of the intensities at which children and young people are engaged in when participating in 'active play' activities children and young people engage in. Therefore it is recommended that: **Accelerometers be worn and observational data collected while children and young people (of all ages) are engaged in 'active play', with researchers reporting the amount of time they are active (e.g. time spent in MVPA or light physical activity from both accelerometry and/or observations made).**

Until a clear definition of 'active play' is developed the standardised self-report questions that should be employed are:

1. How much time did you/your child spend engaged in 'active play' (any play that is not part of organised physical activity or sport, that is not restricted by extrinsic rules usually set and governed by adults e.g. kicking a ball against the wall, playing a game of tag with friends, watering the plants, or playing on fixed equipment at a park) on average per day over the past 7 days? (preschool and primary school children); and
2. How much time did you spend engaged in 'non-organised' physical activity (any physical

**activity that is not part of organised physical activity or sport, that is not restricted by extrinsic rules usually set and governed by adults e.g. kicking a ball against the wall, watering the plants, doing household chores or running around with your dog at the park) on average per day over the past 7 days? (young people in secondary school).**

### How to operationalise the core metric

As there is not yet a clear definition of 'active play' or guidelines/ recommendations of the amount of 'active play' that should be accumulated by children and young people every day and/or week, there are no suggested core metrics for this indicator.

## BEYOND THE GRADE

### Where do children want to go today?

Surveys on the top 10 preferred playspaces for 12-14 year-old Australian children and young people were conducted between 1957 and 2000. Over this period the number of indoor-based activities increased from 20-30% of the top 10 activities in 1957 to 50% of activities in 2000, while the percentage of outdoor-based leisure pursuits declined<sup>59-61</sup> (see Figure 5).

Tandy<sup>62</sup> conducted a similar study comparing the use of their neighbourhood in a group of 421 children from Newcastle, Australia, to that of their parents. She found that children were more restricted than their parents in the use of their neighbourhood.

Only 3% of children were allowed to play wherever they wanted so long as they told their parents, compared to 33% when their parents were their age.

Further, 25% of children were allowed to play in the neighbourhood unsupervised, compared to 83% of children in the generation preceding them.

Preferred play spaces have also changed across generations. Fifty-nine percent of children preferred to play at home or at a friend's home, but less than 1% in the bush or creek. This compares to 34% of yesterday's children and young people who preferred to play at home and 26% in the bush or creek<sup>62</sup>.

The use of outdoor areas has atrophied as the preference for sedentary technologies has increased. When Microsoft asks 'Where do you want to go today?', children seem to answer 'Well not outside, that's for sure.'

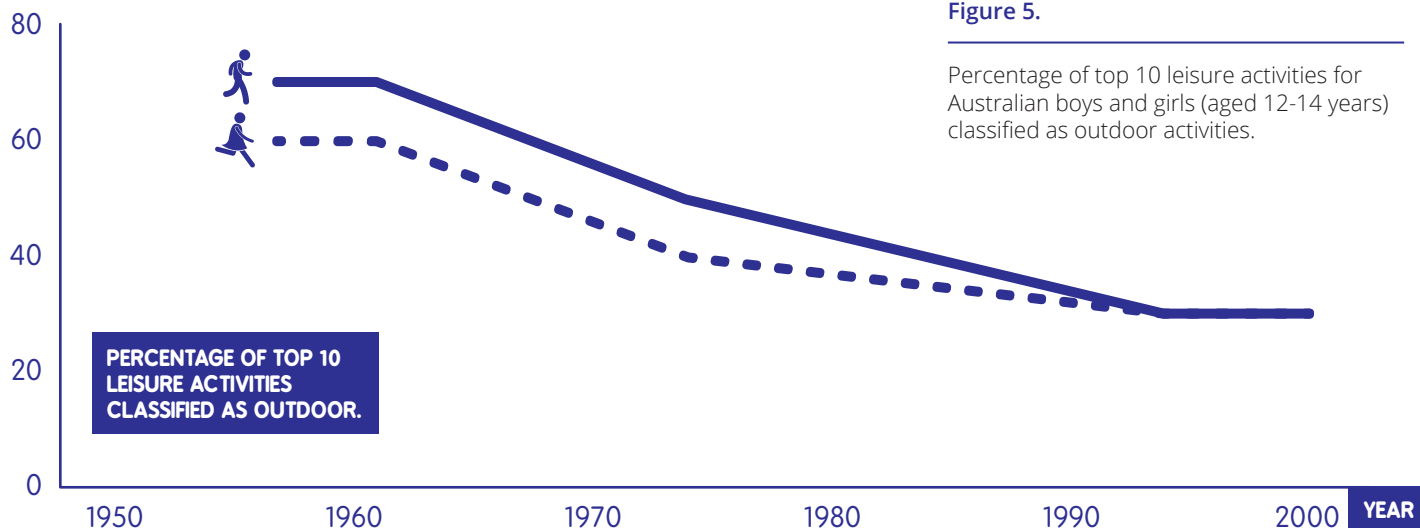


Figure 5.

Percentage of top 10 leisure activities for Australian boys and girls (aged 12-14 years) classified as outdoor activities.



# ACTIVE TRANSPORTATION

# D

## Proportion of Australian children and young people travelling to and/or from school using active transport\* (at least once per week).

*\*Active transport is defined as any form of human powered transport (e.g. locomotion on foot, or bicycle, skateboard, etc). When travelling from place to place, the mode of transport can be considered active if active transport was used for a considerable amount of total travel (e.g. walking 5-10 minutes to the bus stop, travelling by bus and then walking 5-10 minutes to the final destination).*

### Rationale

The majority of Australian primary and secondary school children do not use active transport to travel to and/or from school on a weekly basis. The grade reflects a synthesis of data between two groups, with one (primary school students) doing slightly better than the other (secondary school students).

### Key Findings

- + 20% of secondary school students (aged 12-17 years) travel to and/or from school using active transport at least once per week<sup>9</sup>.
- + According to parents, 35% and 39% of primary school students, aged 6-7 and 11-12 years respectively, travel to and/or from school using active transport at least once per week<sup>8</sup>.
- + Australians aged 5-17 years, on average, spend 18 minutes per day using active transport to various destinations<sup>6</sup>.

### How can we improve the grade?

#### Supported by research

- + Parental concerns about traffic and personal safety are important barriers to active transport. A range of strategies are needed to overcome these concerns and to increase children's competence to use active transport. These strategies may include changes to the physical environment that make it safer and easier for children to negotiate traffic<sup>63, 64</sup>, such as adequate crossing infrastructure and measures to slow traffic, and strategies to improve child and parental perceptions of child competence to walk or cycle to/from school<sup>65, 66</sup>, such as parental accompaniment on active transport trips until a level of independence and competence is possible and skill building programs and encouraging children to walk to/from school with other children.

- + A combined effort is required from parents, schools and local government to increase the proportion of Australian children and young people using active transport to travel to and from school. All schools should have active transport policies to promote and encourage the use of active travel to/from school, which are established as a result of input from all key stakeholders. School site decisions should take into consideration the surrounding environment to ensure that features which support active transport to school, such as low traffic exposure and connected streets<sup>67</sup> are prioritised.
- + Distance is one of the biggest barriers to walking and cycling to/from school<sup>66, 68, 69</sup>. Additional strategies are required to improve active transport to school among those that live outside of a walkable or cyclable distance to school. Park and ride/walk strategies or strategies that encourage active transport for at least part of the school journey may be required.

#### Additional recommendations

- + Both children/young people and parents should incorporate active transport into their everyday routines. Other than school journeys, replacing short car trips to a range of destinations (e.g. local parks, local shops, friend's house) with walking or cycling is feasible (e.g. 1 kilometre is about 15 minutes of walking) and will have a range of benefits both to the child and the environment.

#### What do we need to know?

- + National surveys should contain measures of active transport that include destinations other than the school to provide a better picture of the extent to which this important health behaviour is used.
- + Research examining the use of public transport (which may be especially relevant for secondary school students) is needed as people tend to use active transport (walk/cycle) at each end of a trip.



## What do we need to do?

### How to collect the data

Until we have more quality data regarding active transport across the entire day for Australian children and young people, the standardised self-report questions that should be employed are:

1. On how many of the past 5 school days did you/your child travel to (or part of the way\* to) school by walking, cycling or some other form of active transport?;

2. On how many of the past 5 school days did you/your child travel from (or part of the way\* from) school by walking, cycling or some other form of active transport?; and
3. How many times in the past 7 days did you/your child travel from place to place (not including to/from school) or part of the way\* by walking, cycling or some other form of active transport?

\*Active transport was used for a considerable amount of total travel time.

### How to operationalise the core metric

The core metrics used to assess Active Transportation should be:

1. Proportion of Australian children and young people using active transport at least part of the way to and/or from school on at least one of the past 5 school days; and
2. Proportion of Australian children and young people using active transport at least part of the way from place to place (not including to and/or from school) on at least one of the past 7 days.

## BEYOND THE GRADE

### Time trends in active transportation

There appears to have been a worldwide decline in children's use of active transport (e.g. walking or cycling) over the past 30 to 40 years (see Figure 6). State-based time trend data from Australia paints a very consistent picture, with an overall decline of 42% between 1971 and 2013 (see Figure 6). In New South Wales, the percentage of children walking to/from school declined by 17% (from 50% to 33%) between 1971 and 2003<sup>70</sup>, with the percentage of children walking or cycling to/from school declining by 7% between 1991 and 1999<sup>71</sup>. There have been substantial declines in South Australian children's use of active transport to/from school too, with the Australian Bicycle Lobby<sup>71</sup> reporting a 31% decline from 1981 to 1997, Lewis and colleagues<sup>55</sup> reporting a 19% decline from 1985 to 2004, and Booth<sup>34</sup> reporting a 36% decline from 1985 to 2013. Between 1985 and 2001, the percentage of Victorian children walking or cycling to/from school declined by 10%<sup>35</sup>.

Similar patterns of change have been observed internationally (see Figure 6) with the percentage of children walking or cycling to/from school declining in: (a) Brazil by 7% (2002-2007)<sup>72</sup>; (b) Canada by 12% (1985-1996)<sup>56, 73</sup>; (c) Switzerland by 7% (1994-2005)<sup>74</sup>; (d) the UK by 23% (1975-2012)<sup>75-77</sup>; and (e) the US by 35% (1969-2009)<sup>78, 79</sup>.

Declines in children's use of active transport likely reflect an increased reliance on the motor car as a means of transportation. The increased reliance on the motor car means that fewer journeys will involve the use of active transport, and that busy roads will act as barriers when accessing recreation spaces, making parents less comfortable about allowing their children to play outdoors. Declines in independent mobility may also play a part, as fewer children are allowed to go to recreation spaces or cross roads alone<sup>80</sup>.

### PERCENTAGE OF CHILDREN /YOUNG PEOPLE WHO USE ACTIVE TRANSPORT TO AND/OR FROM SCHOOL

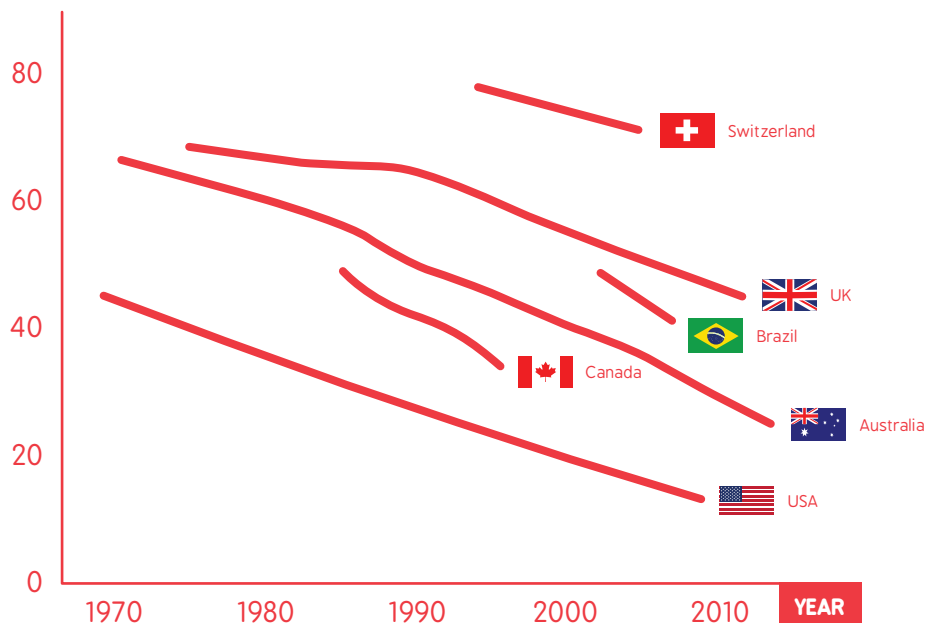


Figure 6.

Time trends in the percentage of children and young people who use active transport to and/or from school.



# SEDENTARY BEHAVIOURS

# D-

Proportion of Australian children and young people meeting the Australian sedentary behaviour screen time guidelines: children aged under 2 years should have no screen time exposure, children aged 2-4 and 5-17 years should not take part in more than one and two hours respectively, of screen activity for entertainment every day of the week<sup>2</sup>.\*

*\* Sedentary behaviors include activities during waking time that involve sitting or lying down and require low levels of energy expenditure (e.g. at school sitting at a desk or a computer, in leisure time watching television, reading or socialising and in transport sitting in a car, bus or train). However, much of the research to date has focused on one domain of sedentary behaviour, screen time, and therefore this is why the metric chosen to assign a grade to the sedentary behaviour indicator has utilised the Australian sedentary behaviour guidelines for screen time.*

## Rationale

The majority of Australian children and young people are not meeting the Australian screen time guidelines.

## Key Findings

- + 26% of Australians aged 2-4 years meet the recommended Australian screen time guidelines<sup>2</sup> of accumulating no more than 1 hour per day<sup>6</sup>.
- + 29% of Australians aged 5-17 years meet the recommended Australian screen time guidelines<sup>2</sup> of accumulating no more than 2 hours per day<sup>6</sup>.
- + 20% of Australians aged 12-17 years meet the recommended Australian screen time guidelines<sup>2</sup> of accumulating no more than 2 hours per day<sup>9</sup>.
- + Adherence to the screen time guidelines declines dramatically with age (5-8 years: 41%; 9-11 years: 30%; 12-14 years: 24%; and 15-17 years: 19%)<sup>6</sup>.
- + On average, Australians aged 2-4 years meet the screen time guidelines on 4 days of every week<sup>6</sup>.
- + On average, Australians aged 5-17 years meet the screen time guidelines on 5 days of every week<sup>6</sup>.
- + Australians aged 5-17 years who meet the physical activity guidelines every day of the week spend, on average, less time per day participating in sedentary screen-based activities in comparison to those children and young people who do not meet the guidelines on any day of the week (110 vs. 197 minutes per day)<sup>6</sup>.
- + There are currently no national data on screen time exposure for children under the age of 2 years.

## How can we improve the grade?

### Supported by research

- + It is important that parents, children and young people understand that some sedentary behaviours (such as screen-based sedentary behaviour) are associated with significant developmental and health issues in young people independent of their level of physical activity (e.g. obesity, cardiometabolic health, psychosocial development, and cognitive development). Consequently some screen-based sedentary behaviours (e.g. screen use for entertainment) are likely to be more detrimental than others (e.g. reading or electronic screen-based homework)<sup>81-83</sup>.
- + Parents, children and young people should be educated, encouraged and supported to adopt strategies (e.g. limiting the amount of screen time, encouraging increased family physical activity participation, removing all screens from children's bedrooms<sup>84</sup>) to reduce the time spent engaged in recreational sedentary screen-based activities.
- + Parents, children and young people should be educated about the consequences of excessive screen time as research has shown that motivation to limit screen time is associated with lower levels of screen time<sup>85</sup>.
- + Outside of the home environment, school is a setting that imposes large amounts of sedentary time onto children and young people<sup>86</sup>. The possibility of breaking up sedentary time (i.e. prolonged periods of sitting) with regular physically active breaks and active/non-sedentary learning time should be explored in both primary and secondary schools<sup>87-91</sup>.



### What do we need to know?

- + More research regarding non-screen based sedentary behaviour, the time children and young people are engaged in such behaviours and the associated health implications is needed to better understand the potential detrimental effects of all sedentary behaviours and not just those that are screen-based.
- + Screen-based media are becoming more and more complex. No longer are children and young people exposed only to fixed screens (televisions and desktop computers) but now a number of mobile devices (tablets, mobile phones, handheld electronic games) are also at their disposal. We need to ensure that the diverse and multi-tasking nature of screen-based sedentary activities (e.g. children texting on their phone, while watching television and playing a game on their tablet)<sup>92</sup> is captured by future research methodologies.
- + National data on the screen time of children aged under 2 years are needed given there are none to date.
- + The total sitting time across all ages (e.g. restrained stroller time for preschool children) and in multiple settings (e.g. school vs. home)<sup>93</sup> needs an increased focus in research in addition to time spent engaged in screen-based activities.
- + Better information is needed on the dose-response relationship between sedentary behaviour and physical and mental health outcomes.

### How to collect the data

Given the complex nature of sedentary behaviour (similarly complex to that of physical activity behaviour) it is important that both objective and subjective measurements of sedentary time (sitting time and screen time) be built into the regular national collection cycle. Objectively, standardised data collection and analysis protocols should be used for various measurement tools (accelerometers and inclinometers for measures of sitting time), such that: **Children are monitored for a 7-day period<sup>94</sup> and researchers report the amount of activity time (e.g. minutes spent sedentary).**

The proposed self-report questions that should be employed are:

1. **On how many days, during the past 7 days, were you/your child engaged in screen-based (all forms e.g. television, tablets, computers, playstation) activities for entertainment for less than 1 (2-4 years) or 2 (5-17 years) hour/s per day?;**
2. **During the past 7 days, was your child (aged less than 2 years) exposed to any form of screen-based (e.g. television, tablet) activities?;** and
3. **On how many days, during the past 7 days, was your child (0-5 years only) kept inactive or restrained (e.g. stroller, high chair, car seat) for more than 1 hour at any time?**

While the updated Australian sedentary behaviour guidelines specify that children and young people aged 5-17 years should limit the total time they spend sitting and break up prolonged periods of sitting with regular breaks<sup>2</sup>, at this time there is no suggested standardised question that should be employed.

### How to operationalise the core metric

Consistent with the current Australian recommended sedentary behaviour guidelines<sup>2</sup>, the three core metrics proposed for sedentary behaviours are:

1. **Proportion of Australian children and young people meeting the recommended sedentary behaviour (screen) guidelines\* every day;**
2. **Proportion of days (during the past 7 days) that Australian children and young people meet the recommended sedentary behaviour (for screen) guidelines\*;** and
3. **Proportion of Australian infants/toddlers/pre-schoolers meeting the recommended sedentary behaviour (restrained from inactivity) guidelines\* every day.**

*\*no exposure <2 years, ≤1 hour every day for 2-4 years and ≤2 hours for 5-17 years.*

*# ≤1 hour of being inactive or restrained at any one time.*

### Sedentary behaviour guideline development

As we build up substantial Australian and international databases of objective measures for sedentary activities coupled with health outcomes or evidence from experimental and longitudinal studies, we need to revise the guidelines according to the new dose-response relationships that may be elicited. This should occur in a timely fashion as the data become available. Once this occurs it may be possible to develop a metric that focuses on other (non-screen-based) forms of detrimental sedentary behaviour (e.g. sitting time for children and young people).

# BEYOND THE GRADE

## *Sitting and the Electronic Environment*

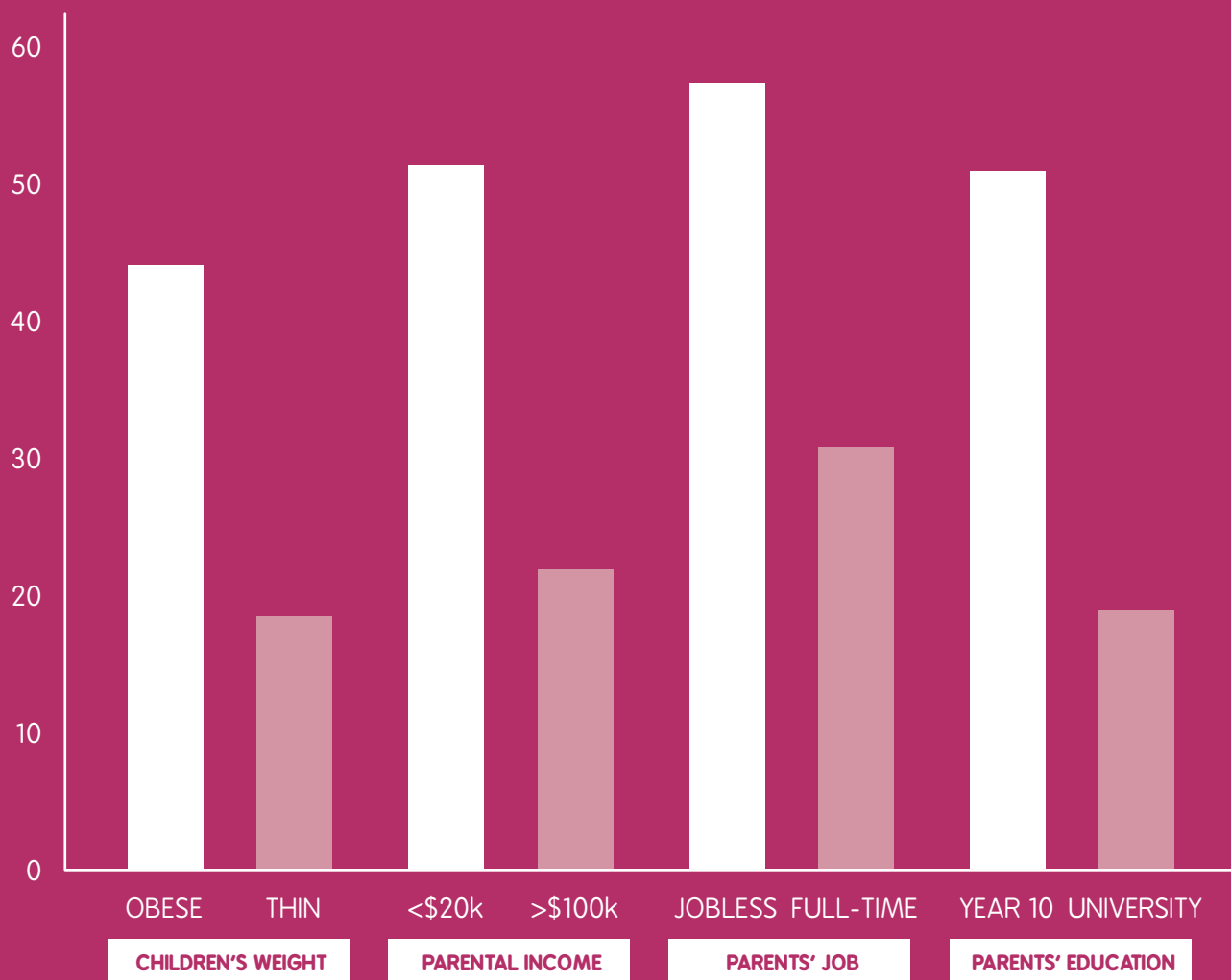
The average Australian young person spends about four hours a day in front of a screen of some sort. A typical home now has three TVs, three laptops and two videogame consoles, and a child's bedroom resembles an electronics display room. About a third of Australian children aged 9-11 have a TV in their bedroom and on average these children watch three hours' more TV each week than children who do not have a bedroom TV. They also get 45 minutes less physical activity each week, one hour less sleep, and spend one hour more on the computer. They snack more in front of the TV, eat more fast food and consume more soft drinks, are 10% fatter, have larger waist girths, less self-confidence in being physically active, lower health-related quality of life, and their NAPLAN scores are on average 30 points lower. If we halve their television use, as US researcher David Epstein<sup>95</sup> did by using electronic monitoring devices, they will eat 400 kJ less each day and will lose weight relative to their unrestricted peers. This may be why only 15% of thin Australian children have a TV in their bedroom, compared to 43% of obese children.

What kinds of families are more likely to have TVs in their children's bedrooms? In Australia, while about 33% of families with children have a TV in the children's bedrooms, this figure is 53% for the poorest fifth of families, and 22% for the richest fifth. In families where the primary breadwinner is unemployed, 58% of children have TVs in their bedrooms, compared to 31% for those in full-time work. If the highest level of education of either caregiver is less than Year 12 at high school, 53% of children have TVs; if at least one parent has a university degree, only 19% of children have TVs. In over half of single-parent families there is a TV in the child's bedroom; in two-parent families, the probability is less than 3 in 10. Parents in households which have TVs in their children's bedrooms are on average 3 kg heavier, their annual income is \$30,000 a year less, mothers have breast fed their children for 3 months less, and the parents themselves get three hours more TV each week. In other words, these are more likely to be low-income, low-education, low health-literacy families (see Figure 7), and the TV in the bedroom is more likely to be a marker of multiple dysfunctional aspects impacting on a child's health than a direct cause.

Are we fighting a losing battle trying to get TVs out of children's bedrooms? With media convergence, children can (and do) watch *Modern Family* or *Peppa Pig* on screens of any size from matchbox to cinema. Since iPads were first introduced in 2010 more than 170 million have been sold, including 2.3 million in Australia in the first 6 months of 2013 alone. In the UK, 25% of children aged 12-15 years have a personal tablet and tablet use at home has tripled in children aged 5-15 since 2012. The Federal Government's \$2.4 billion Digital Education Revolution Initiative bought 1.5 million portable computers for school children. Tablets bring their own special problems, particularly with musculo-skeletal issues, which are likely to arise from a smaller variation of task postures and muscle activity<sup>96</sup>.

So what can parents do? There is strong evidence that general monitoring of media use (knowing where children are using screens and what they are watching), setting some rules, offering non-screen alternatives like board games, modeling more moderate screen behaviours, and getting children outdoors are all effective in reducing screen time. So there is light at the end of the tunnel – other than the flicker of an iPad, that is.

## PERCENTAGE OF HOMES WITH TVS IN CHILDREN'S BEDROOMS



**Figure 7.**

Percentage of homes with televisions in children's bedrooms according to specific individual and family attributes.



# FAMILY AND PEERS – INFRASTRUCTURE, SUPPORT, PARENTAL/ PEER BEHAVIOUR

# C

- Proportion of Australian children and young people who are reported to have at least one screen-based device in their bedroom;
- Proportion of Australian children and young people who receive some form of encouragement from their parents to be physically active on a weekly basis; and
- Proportion of Australian adults and mothers/fathers who meet the Australian physical activity guidelines: adults should take part in at least 150 minutes of moderate activity or 75 minutes of vigorous activity each week to enhance their health<sup>2</sup>.

## Rationale

The grade assigned to this indicator is a reflection of good support from parents in the form of encouragement to children and young people to be physically active, however the at home infrastructure (televisions in bedrooms) and parental role modeling need improvement.

## Key Findings

- + According to parents, 16% of 2-4 year olds and 51% of 5-17 year olds have at least one screen-based device in their bedroom<sup>6</sup>.
- + 18% of 6-7 year olds and 36% of 11-12 year olds have at least one screen-based device in their bedroom<sup>8</sup>.
- + 46% of Australians aged 12-17 years have at least one screen-based device in their bedroom<sup>9</sup>.
- + 76% of Australians aged 12-17 years report they are receiving at least some form of encouragement to be physically active (at least once per week) from their parents<sup>5</sup>.
- + 43% of Australian adults, 30% of fathers and 22% of mothers are meeting the recommended Australian physical activity guidelines of being active on most, preferably all, days every week<sup>6, 8</sup>.

## How can we improve the grade?

### Supported by research

- + Parents should reduce the amount of time they and their families spend engaged in sedentary behaviours and try to incorporate a number of different physical activities, of varied intensities (i.e. light, moderate, vigorous) at times they/their family would normally be sedentary<sup>97</sup>.

- + Programs that are implemented should: target both mothers and fathers<sup>98</sup>; target parenting practices and beliefs relating to physical activity and screen time; and provide education on optimising the home physical activity and screen time social and physical environment to maximise physical activity opportunities.

### Additional recommendations

- + The amount of screen-based activity children and young people use for entertainment needs to be limited, so that children and young people are at least not exceeding the current recommended Australian screen time guidelines (no more than 2 hours per day for 5-17 years and 1 hour per day for 2-4 years).
- + Parents are encouraged to lead by example by limiting their screen time (for entertainment purposes) and act as role models for their children. They are encouraged to engage in more physical activity throughout their entire day (e.g. active transportation, co-physical activity such as playing together with their children) and include their children as often as possible in fostering a strong physically active family ethos.
- + It is important that physical activity participation for children and young people be facilitated, supported and encouraged in a number of different ways by parents (e.g. attending training sessions, walking with children to various locations, taking the time to play with their children both indoors and outdoors).



### What do we need to know?

- + There is a lack of research regarding the influence of peers on physical activity participation. We need to know how children are influenced by their peers and what children and young people do to encourage and/or support their peers to be physically active.
- + A more in-depth look is needed at how parents interact with their children when they are physically active and the time they spend doing so.
- + There is a lack of solid evidence on how to engage parents and who to target.
- + Strategies to engage both boys and girls in physical activity and minimise screen time are not well established in the home environment.

Given the complex nature of this indicator there are a number of standardised questions and core metrics needed to assign a grade. Each of the components of this indicator is listed below with the suggested question/s and metric/s.

#### How to collect the data

Infrastructure – The standardised questions that should be employed are:

1. **Do you/does your child have at least one fixed screen-based device (e.g. television, computer) in their bedroom?;** and
2. **Do you/does your child regularly have mobile screen-based devices (e.g. iPad, smart phone, portable game device) in their bedroom?**

Support – The standardised questions that should be employed are:

1. **On how many days, during the past 7 days, did you receive/did you give your child some form of encouragement to be physically active (e.g. "It is great that you have been playing outside more with your brother/sister this week") ?;** and
2. **On how many days, during the past 7 days, did you receive/did you give some form of encouragement from/to your friends or peers to be physically active (e.g. "It's great we are riding to school together from now on")?**

Parental/peer behaviour – The standardised questions that should be employed are:

1. **During the past 7 days how much moderate (leaving you somewhat tired) and/or vigorous (leaving you substantially tired) physical activity did you engage in (total amount in minutes)?;**
2. **On how many days, during the past 7 days, were you physically active with a parent/with your child?;** and
3. **On how many days, during the past 7 days, were you physically active with a friend or peer?**

#### How to operationalise the core metric

Infrastructure – The core metrics used to assess the component of infrastructure for this indicator should be:

1. **Proportion of Australian children and young people with at least one screen-based device in their bedroom; and**
2. **Proportion of Australian children and young people who regularly have a mobile screen-based device in their bedroom.**

Support – The core metrics used to assess the component of support for this indicator should be:

1. **Proportion of Australian children and young people who receive some form of encouragement from their parents/friends and peers to be physically active at least once per week; and**
2. **Proportion of Australian children and young people who give some form of encouragement to their friends or peers to be physically active at least once per week.**

Parental/peer behaviour – The core metrics used to assess the component of parental/peer behaviour for this indicator should be:

1. **Proportion of Australian adults/parents meeting the recommended physical activity guidelines\*;** and
2. **The proportion of Australian children and young people who are physically active with their parents/friends or peers at least once per week.**

*\*At least 150 minutes of moderate, 75 minutes of vigorous or an equivalent combination of both moderate/vigorous physical activities each week.*



# BEYOND THE GRADE

## *Then and now: How have families changed?*

Family plays an important role in a child's life. What family means to one person may not necessarily mean the same to another and the way we view families outside of our own differs also. All families are different and what the typical Australian family looked like 50 years ago may be vastly different to what we see today. It is important to have an understanding of how family types, relationships, structures and functioning have changed to gain some insight into the changing behaviours of Australia's children and young people.

So if we were to look into Australian households of the past what would find? During the 1960s and 70s women were typically giving birth to 3.5 babies<sup>99</sup>, almost 60% of families were couples with children<sup>100, 101</sup>, women (who were already married) were typically in their early twenties when they gave birth to their first child<sup>102-104</sup> with 4.8% of births occurring outside of marriage<sup>105, 106</sup> and the marriage and divorce rates (per 1,000 in the population) were 7.3% and 0.6% respectively<sup>107, 108</sup>.

During the 1980s women were typically giving birth to 1.9 babies<sup>99</sup>, 56% of families were couples with children<sup>100, 101</sup>, women (who were already married) were typically in their early to late twenties when they gave birth to their first child<sup>102-104</sup> with 13% of births occurring outside of marriage<sup>105, 106, 109</sup>, 43% of mothers (with dependent children) were in paid work with 50% of couple families receiving only a single income<sup>110</sup>, 5% of mothers were likely to have a post-school qualification<sup>101</sup> and the marriage and divorce rates (per 1,000 in the population) were 7.4% and 2.7% respectively<sup>107, 108</sup>.

Today we see that women are typically having 1.9 babies (the same as in the 1980s)<sup>99</sup>, 45% of families are couples with children<sup>100, 101, 111</sup>, women (married or not married) are typically in their late twenties to early thirties when they give birth to their first child<sup>102-104, 112, 113</sup>, with 34% of births likely to occur outside of marriage<sup>105, 106, 109</sup>, 63% of mothers (with dependent children) are in paid work with 30% of couple families receiving only a single income<sup>110</sup>, 14% of sole mothers and 26% of couple mothers are likely to have a post-school qualification<sup>101</sup> and the marriage and divorce rates (per 1,000 in the population) are 5.4% and 2.3% respectively<sup>107, 108</sup>.

Families today are different to those from 50 years ago and even those from 30 years ago (Figure 8). Women are having fewer babies, parents (especially mothers) are working more and there are more single parent families. So what does this mean for Australian children and young people when we are thinking about potential changes in physical activity? Children will have fewer siblings to play with, and parents may be more likely to turn to the television or videos as the babysitter while they do the household chores. There will also be a reduction in the 'critical mass' of children. This means that there will not be enough children to form active play groups, sporting teams, gangs and recreational groups such as Boy Scouts and Girl Guides. The increasing proportion of single parent families and families where both parents work has reduced the time parents can devote to playing with their children and under- or over-employment have resulted in a large pool of people with insufficient resources, or time, or both, to actively engage with their children in recreational activities. It is important that we understand what changes have occurred and what changes are likely to occur in the future so we can adapt and modify the ways in which we engage with Australian families.



## SPOT THE DIFFERENCE

(1) Number of children per family (3.5 vs. 1.9).



(2) Likelihood of births occurring outside of marriage (4.8% vs. 34%).



(3) Age that mothers were/are likely to have their first child (early 20s vs. early 30s).



(4) Likelihood that mothers (with dependent children) were/are in paid work (43%\* vs. 63%).



Figure 8.

'Spot the Difference'. A family from the 1960s compared to a family of today.  
 (1) Number of children per family; (2) Likelihood of births occurring outside of marriage; (3) Age that mothers are likely to have their first child; (4) Likelihood that mothers (with dependent children) were/are in paid work.

\* Data only available for 1980s not 1960s.

# SCHOOL – INFRASTRUCTURE, POLICIES AND PROGRAMMING

## B-

- Proportion of schools that have a specialist physical education teacher to take physical education lessons;
- Proportion of schools that schedule the delivery of at least 120 minutes of physical education per week to students;
- Proportion of schools that have physical activity facilities/equipment available to students; and
- Proportion of schools that allow children to use physical activity equipment/facilities during school hours.

### Rationale

This indicator is informed by metrics relating to school infrastructure, policy and programs. Given a mixture of results were assigned for each metric ranging from A- to D+, an overall grade of B- was allocated as the majority of metrics were scored in the A to B range.

### Key Findings

- + 70% of primary schools report that their students have access to a specialist physical education teacher, but there was no indication of the level of qualification attained, whether they taught the scheduled physical education classes to all students or whether they were employed full-time by the school or an external provider<sup>8</sup>.
  - + 35% and 57% of secondary schools (urban and rural respectively) report having a specialist physical education teacher who delivers physical education classes, but there was no indication of the level of qualification attained<sup>22</sup>.
  - + 64% of primary schools report providing at least 120 minutes of physical education per week to students<sup>8</sup>.
  - + 51% of secondary schools report providing at least 80 minutes of physical education per week to students<sup>22</sup>.
  - + A high proportion of primary and secondary (rural and urban) schools report having physical activity facilities on school grounds (hard courts: 100%; playing fields: 50-100%; indoor play space: 70-91%; and playground: 86-100%)<sup>22</sup>.
  - + A high proportion of primary and secondary (rural and urban) schools
- report that most of their physical activity facilities/equipment are available to students during school hours (including recess and lunch) (hard courts: 71-100%; playing fields: 86-100%; indoor play space: 20-50%; playground: 91-100%; and sports/physical activity equipment: 50%)<sup>9, 22</sup>.
- ### How can we improve the grade?
- Supported by research*
- + All physical activity/sport equipment that is available on school grounds should be made accessible to students during school hours and maintained at a high standard<sup>114</sup>. Teachers should also facilitate the process of distribution and provide ideas for activities.
  - + It is imperative that both primary and secondary schools employ specialist physical education teachers on a full-time basis, with the appropriate tertiary education (i.e. a specific physical education program) who take all formal physical education lessons<sup>46, 47</sup>.
  - + Individuals employed in physical education roles should receive greater recognition (e.g. schools emphasising the importance of physical education to students and parents) to ensure their motivation to deliver high quality physical education remains high<sup>46</sup>.
  - + The physical education program that is delivered to students (at both primary and secondary school) should be continually evaluated to ensure that participation rates/times are high (i.e. engage all students and maximise the time students are active) and the required skills/techniques are learned and acquired<sup>46</sup>.



## What do we need to do?

### Additional recommendations

- + General classroom teachers should have continual development in how to engage children and young people in physical activity which they can utilise during daily class time schedules and at recess and lunch times.
- + All schools should initiate physical activity policies that align with the health promoting schools framework and outline ways to encourage and engage students in physical activity through the course of the school day and promote/offer physical activity programs outside of formal physical education classes. The development of such policies should include teachers, parents and students.
- + We need to ensure early childhood service providers give preschool aged children ample time and opportunities to be physically active in structured and unstructured play. Policies should be developed and staff training continually implemented within these settings to ensure that children are engaged and encouraged to be physically active throughout their entire day.

### What do we need to know?

- + Research into the quality of physical education at both primary and secondary schools is important to ensure we have an understanding of exactly how active children and young people are during these times.
- + Research into the impact of school policies regarding sedentary behaviour, light activity and MVPA across the school day is needed.
- + Greater resolution when examining who takes physical education classes at school (i.e. specific qualifications of teachers) and whether they are employed on a full-time basis is necessary.
- + Research into why facilities/equipment at schools do or do not get used by students is important to understand barriers to participation in physical activity at school.
- + There is a clear lack of research into preschool, early learning and childcare settings that examines physical activity infrastructure, policies and programs. This needs to be addressed.
- + We need to know more about the impact of professional learning in teachers' arrangement of class organisation, management, transitions and maximisation of active learning time in physical education.
- + Research into optimal pedagogies to develop confidence and competence in fundamental movement skills and movement in lessons is required<sup>47</sup>.

Given the complex nature of this indicator there are a number of standardised questions and core metrics needed to assign a grade. Each of the components of this indicator are below with the suggested question/s and metric/s.

#### How to collect the data

Infrastructure – The standardised questions that should be employed (directed at children, school staff or as part of an audit) are:

1. Does your school have or have access to a gymnasium (or indoor play space)/outside sports field (or grassed area)/hard court (or paved area)/playground/sports (or physical activity) equipment\*?;
2. If available, do you/students have access to a gymnasium (or indoor play space)/outside sports field (or grassed area)/hard court (or paved area)/playground/sports (or physical activity) equipment\* during school hours (but outside of scheduled physical education classes)?; and

On how many days, over the past 5 school days, did you/students use the gymnasium (or indoor play space)/outside sports field (or grassed area)/hard court (or paved area)/playground/sports (or physical activity) equipment\* during school hours (but outside of scheduled physical education classes)?

Policies – The standardised questions which should be employed (directed at school staff or as part of an audit) are:

1. Does the school employ a tertiary qualified physical education specialist teacher on a full-time basis?;
2. Does a tertiary qualified physical education specialist teacher deliver all scheduled physical education classes for all students?; and
3. How much scheduled physical education is delivered to all students on average every week (in minutes)?

Programming – The standardised question that should be employed (directed at students, school staff or as a part of an audit) is: **Does your school offer physical activity/sports programs to all students outside of their formal physical education classes?**

*\*For each question a separate answer needs to be given for each of the facilities/equipment listed and/or available.*

#### How to operationalise the core metric

Infrastructure – The core metrics used to assess the infrastructure component of this indicator should be:

1. Proportion of schools that have access to a gymnasium (or indoor play space)/outside sports field (or grassed area)/hard court (or paved area)/playground/sports (or physical activity) equipment#;
2. Proportion of schools that allow students to use during school hours (but outside of scheduled physical education classes) a gymnasium (or indoor play space)/outside sports field (or grassed area)/hard court (or paved area)/playground/sports (or physical activity) equipment#; and
3. Proportion of schools at which (if available and students have access to) their gymnasium (or indoor play space)/outside sports field (or grassed area)/hard court (or paved area)/playground/sports (or physical activity) equipment# is used daily by students during school hours (but outside of scheduled physical education classes).

Policies – The core metrics used to assess the policies component of this indicator should be:

1. Proportion of schools that employ a tertiary qualified physical education specialist teacher on a full-time basis;
2. Proportion of schools that have a tertiary qualified physical education specialist teacher deliver all scheduled physical education classes for all students; and
3. Proportion of schools that deliver at least 120 minutes per week of scheduled physical education classes to all students.

Programming – The core metric used to assess the programming component of this indicator should be: **Proportion of schools that offer additional physical activity/sports programs to all students outside of their formal physical education classes.**

*#For each metric an individual proportion should be reported for each facility/equipment listed and/or available.*



# BEYOND THE GRADE

## *Where should I enrol my child?*

The choice of where to send your child to school is a daunting task for most parents. What do you base your decision on? Is it how many ovals the school has, the uniform the students are required to wear, how much it will cost for your child to attend, how many physical education classes they participate in every week, class sizes, the teaching philosophies of school staff, or is it just a gut feeling you get about whether it will be right for your child? In most circumstances a range of things would be considered by parents, but what if there was one thing that they didn't need to worry about because it was the same for all schools?

The International Study of Childhood Obesity, Lifestyle and the Environment (ISCOLE)<sup>115</sup> examined 528 children (aged 9-11 years) from 26 randomly-selected schools in metropolitan Adelaide. Data collected by the study were used to examine whether school-level SES (determined by Australian Government's 'Index of Community Socio-Educational Advantage') was associated with: the facilities (relating to physical activity) that were available; the school policies (relating to physical activity) in place; the sports offered to school students (both inter- and intra-school); and the percentage of students participating in school (inter- and intra-school) sports or physical activity clubs. Associations between school facilities, policies, sports offered and participation rates with in-school MVPA (measured by accelerometers) were also looked at.

Preconceived ideas about high- and low-level SES schools may lead some to think that there is a clear divide between the two when considering the facilities available to students, the policies in place and the sports offered, but in fact this is a consideration parents can rest easy about. There is no difference between the two. Data show that school-level SES has no significant association with the facilities available, the policies in place, the sports offered and the participation rates of students in inter- and intra-school sport or physical activity programs. Similarly, no significant associations were found between school facilities, school policies, sports offered or student participation rates in inter- and/or intra-school sport with in-school MVPA. And so while data show that there are SES gradients in both total and in-school MVPA, they are not due to facilities available or the policies in place.

So what does this mean? Children attending primary schools of varied SES levels are not advantaged/ disadvantaged with regard to the facilities available and policies in place to support and facilitate physical activity. The SES level of the school does not determine the sports that are offered to students or the participation rates in inter- and intra-school sports and physical activity programs. None of these factors come into play when thinking about the amount of in-school MVPA typically obtained either. While this might not alleviate all of the pressure parents experience when choosing a school for their child, it is one piece of the puzzle already in place when they ask themselves: 'Where should I enrol my child?'

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# WHERE SHOULD I ENROL MY CHILD?





# COMMUNITY AND THE BUILT ENVIRONMENT – INFRASTRUCTURE, POLICIES, PROGRAMS, SAFETY

## A-

- Proportion of Australian children/parents who report that there is a playground near to their home; and
- Proportion of parents who report heavy/problem traffic not to be an issue in their home or school neighbourhood.

### Rationale

Both metrics used to inform the grade for this indicator are graded high (A and A-). However, an overall grade of A- was assigned given the limited nationally representative data available regarding policies and programs.

### Key Findings

- + 87% of Australians aged 12-17 years and 84% of parents report having a playground that they/their children can access near to their home<sup>8,9</sup>.
- + According to 75% of parents, heavy or problematic traffic is not a concern near to their child's school neighbourhood<sup>8</sup>.

### How can we improve the grade?

#### Supported by research

- + Playground design should take into account the needs of a diverse age group, providing equipment that is appropriate and appealing to older children as well as options for younger children<sup>116</sup>.
- + Aspects of the built environment known to support children's physical activity include access, density and proximity to parks and recreation facilities, walkability (including access to a range of destinations [land-use mix] and residential density), walking/ cycling facilities such as walking/ cycling tracks, and pedestrian safety structures<sup>117</sup>. Given the diverse governmental departments and

agencies responsible for these built environmental attributes, building healthy active environments will require inter-sectoral action between town planning, urban design, infrastructure, parks and recreation agencies at all levels of government. Principles of healthy active built environments for people of all ages should be incorporated into a range of local government, state and national policies and frameworks/guidelines.

### Additional recommendations

- + Well-maintained playgrounds need to be sited within easy walking distance of families with young children.

### What do we need to know?

- + Current representative data do not provide information on whether playgrounds, parks and other recreational facilities are accessible by walking, their density relative to closeness to home, and the quality of the playgrounds or facilities.
- + Representative data on provision of community-based physical activity programs and clubs are lacking.
- + The extent to which principles to underpin built environmental attributes to support physical activity are embedded into policy and practice frameworks/guidelines is needed.





## What do we need to do?

Given the complex nature of this indicator there are a number of standardised questions and core metrics needed to assign a grade. Each of the components of this indicator are reported below with the suggested question/s and metric/s.

### How to collect the data

**Infrastructure** – The standardised question that should be employed (directed at parents or children) is: **Is there a playground/park/sports field or facilities\* within walking distance of your home?**

**Programs** – The standardised question that should be employed is: **My local neighbourhood offers physical activity programs suitable for me/my child — strongly disagree, disagree, neutral, agree, strongly agree.**

**Safety** – The standardised questions that should be employed are:

1. **There is a lot of traffic in my/my child's neighbourhood/school neighbourhood\* — strongly disagree, disagree, neutral, agree, strongly agree;**

2. **There are safe crossings for me/my child to use if I/they used active transport to travel to school/local playground/local park/local shops/local sports field or facilities\* — strongly disagree, disagree, neutral, agree, strongly agree; and**
3. **I prevent my child from being physically active outdoors in our community, on their own or with friends, because of safety concerns — strongly disagree, disagree, neutral, agree, strongly agree.**

*\*For each question an answer should be provided for each item.*

### How to operationalise the core metric

**Infrastructure** – The core metric used to assess the infrastructure component of this indicator should be: **Proportion of Australian children and young people who have a playground/park/sports field or facilities\* within walking distance of their home.**

**Programs** – The core metric used to assess the programs component of this indicator should be: **Proportion of Australian children and young**

**people who are offered suitable physical activity programs within their local neighbourhood (some level of agreement).**

**Safety** – The core metrics used to assess the safety component of this indicator should be:

1. **Proportion of Australian children and young people who have a lot of traffic in their neighbourhood/school neighbourhood\* (some level of agreement);**
2. **Proportion of Australian children and young people who have safe crossings to access if they use active transport to travel to school/local playground/local park/local shops/local sports field or facilities\* (some level of agreement); and**
3. **Proportion of parents who prevent their child from being physically active outdoors in their community, on their own or with friends, because of safety concerns (some level of agreement).**

*#For each metric an individual proportion should be reported for each item.*

## BEYOND THE GRADE

### How far is too far?

When a new school, shopping centre, sports centre or playground is being built, how much thought goes into 'how long will it take people to walk here?'. Distance is one of the key determinants of whether children will use active or passive transport to travel to a destination<sup>66, 68, 69</sup>. So how far is too far?

Harten and Olds<sup>118</sup> examined the likelihood that Australian children (aged 11-12 years) would use active transport to travel to different destinations based on the distance of the trip. The likelihood decreases quite alarmingly as the distance increases, with 90% of trips likely to be active when the travel distance is  $\leq 250$  m, 75% when  $\leq 400$  m, 50% when  $\leq 900$  m, 25% when  $\leq 2000$  m and 10% when  $\leq 3200$  m (see Figure 9). Harten and Olds<sup>118</sup> also reported that active transport will almost certainly (>99% chance) be used when the travel distance is  $\leq 200$  m and almost certainly not (<1% chance) when  $\geq 4500$  m.

So now that we have some idea of *how far is too far*, it is important that before new schools, shops, sports centres and playgrounds are built there is some discussion between different community sectors about where they should be located so that a large majority of children and young people are likely to travel to these destinations using active transport rather than deciding it is simply too far to walk.

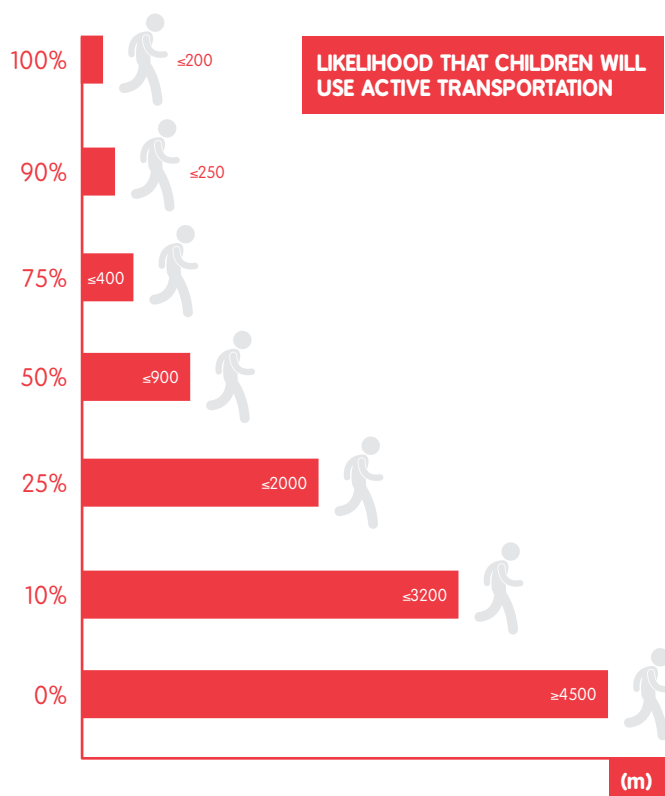


Figure 9.

Visual representation of the likelihood that children (aged 11-12 years) will use active transport to travel to a destination given the distance of the trip.

# GOVERNMENT STRATEGIES AND INVESTMENTS



- Evaluation of a number of major government initiatives (introduced since 2008), whether they were implemented correctly and evaluated appropriately;
- The amount of money committed by the government (federal, state, local) to various physical activity endeavours, initiatives and organisations; and
- The work of non-government organisations was also evaluated

## Rationale

While there have been a number of important government strategies and initiatives implemented over the last five years there is still a tremendous amount of work to be done with regard to program/initiative evaluation, furthering opportunities for community engagement and policy development. There has also been a lot of important work done by non-government organisations during this period, which improved the final grade.

## Key Findings

There were a number of things considered when assigning a grade to this indicator. The following are the government initiatives/programs considered when assigning the grade:

- + The National Partnership Agreement on Preventative Health was established with the aim of addressing the rising prevalence of lifestyle-related chronic disease. The purpose of the agreement was/is to create opportunities for initiatives within specific settings (e.g. workplaces, childcare settings, communities etc.) to be established to lay the foundations for healthy lifestyle behaviours amongst all Australians<sup>119</sup>. The specific initiatives that have been established, relating to the physical activity of children and young people, include:
  - (a) Healthy Children – federal funding provided to states and territories to promote and encourage increased physical activity and better nutrition in children through establishing specific programs and activities (Funding: \$244.4 million 2011-12 to 2017-18);
  - (b) Reward Payments – States and territories are eligible to receive up to \$153.8 million as reward for the attainment of agreed performance benchmarks (e.g. a specific proportion of children and young people meeting the Australian physical activity guidelines); and

(c) Enabling infrastructure – The Australian Health Survey (Funding: \$15.0 million from 2009-10 to 2012-13), Enhanced State and Territory Surveillance (Funding: \$10.0 million from 2010-11 to 2012-13) and Australian National Preventive Health Agency (Funding: \$46.7 million from 2009-10 to 2015-16).

- + The National Preventative Health Taskforce released the National Preventative Health Strategy: Australia the healthiest country by 2020 – the roadmap for action<sup>120</sup>.
- + Get Set 4 Life<sup>121, 122</sup> is a guide, developed by the Commonwealth Scientific and Industrial Research Organisation, that is given to parents when their child attends their 'Healthy Kids Check' at age 4, which provides practical information to assist parents with how to interact with and encourage their children to develop and reinforce healthy lifestyle habits (e.g. healthy eating and physical activity).
- + Active After-School Communities (AASC) was established in 2005 and is an ongoing program that has been run in 3,250 schools and after-school care sites across Australia. The program introduces children to a large number of sports and structured physical activities in a fun, free and safe environment with a prime focus on engaging children who are typically considered non-active (Funding: \$125 million 2007 to 2010; and \$32.9 million 2012 to 2013)<sup>123</sup>.
- + The Healthy Spaces and Places project is a collaboration between the Australian Local Government Association, National Heart Foundation of Australia and the Planning Institute of Australia that has produced a web-based national planning guide to assist with designing spaces using active living principles<sup>124</sup>.



The other key findings that informed the grade include:

- + The outstanding commitment from non-government organisations, such as the National Heart Foundation of Australia and the Australian Cancer Council, to improve the health of Australians including children and young people through various initiatives which aim to increase physical activity participation (e.g. Jump Rope for Heart).
- + While there has been a large number of initiatives established records of how they were implemented and their evaluation are not easily sourced or attainable. Therefore the resulting benefit is unknown.
- + Australia does not currently have a national physical activity policy that would enforce the need for a national physical activity plan. This could potentially be a stand-alone document or be integrated within already existing policies (e.g. policies addressing health promotion).
- + The Department of Health and Ageing recently released updated national physical activity and sedentary behaviour guidelines for all Australians (from birth to older Australians)<sup>2</sup>. However, these updated guidelines were prepared and ready to be released two years ago and given their importance in promoting and encouraging increased physical activity, this delay was not ideal.
- + While there are national physical activity guidelines in place, there is a lack of awareness of the guidelines amongst the Australian public. Research shows that 20-31% of parents and 18-22% of secondary school children can correctly identify what the Australian physical activity guidelines for children and young people are<sup>22, 125</sup>.

- + There have been large amounts of funding, provided by the Australian Sports Foundation (ASF) and Australian Sports Commission (ASC), over the past five years to various sporting organisations, institutions, programs and initiatives (ASF: \$67.1 million 2008/09 to 2011/12; ASC: \$1.14 billion 2008/09 to 2011/12)<sup>126</sup>. While this is a substantial contribution to an area which Australia as a nation is very passionate about, the same type of commitment is needed for physical activity participation for Australian children and young people with the purpose of increasing overall physical activity levels, not just those directed into sports participation and competitive activities. As the Report Card shows, relative to other physical activity behaviour indicators, Participation in Organised Sport and Physical Activity scored the best grade.

### How can we improve the grade?

#### Supported by research

- + More awareness amongst the Australian public, via national messaging campaigns, is needed regarding the updated Australian physical activity and sedentary behaviour guidelines for children and young people. If we hope to have an impact on the activity levels of all young Australians there needs to be an understanding of how much physical activity is needed to acquire health benefits and how this level of activity can be achieved<sup>4</sup>.

#### Additional recommendations

- + There is a need to implement a national physical activity policy that is coherent with and complementary to other sectors. This would ensure that a strategic national physical activity plan was established and could be integrated with a number of sectors.
- + Strong collaborations between federal, state and local governments as well as non-government organisations need to be established (if not already established) and maintained with the purpose of establishing evidence-based intervention strategies to increase physical activity participation.

### What do we need to know?

- + Evaluation of all key government strategies and initiatives is important and needs to be available to the public so that the government can be held accountable for what it is doing.
- + A central repository of government expenditure on physical activity strategies and initiatives for children and young people is important when assessing how the government distributes its funds to different sectors.
- + National data regarding the awareness of physical activity and sedentary behaviour guidelines amongst the Australian public is important when implementing interventions, programs etc.

### What do we need to do?

Given the complexity of this indicator there is no proposed standardised question or core metric.



# BEYOND THE GRADE

## Looking above and beyond

Government leadership is vital in achieving an increase in population physical activity levels, particularly for children for whom many of the opportunities to be active are determined for them by adult decision makers - parents, teachers, coaches and of course governments. Policy priorities across sectors and related funding decisions at federal, state and local levels can have a direct impact on opportunities to be active and on access to environments and facilities for physical activity and active living.

The World Health Organisation (WHO), in response to recommendations from the 2011 United Nations High-Level Meeting on the prevention and control of non-communicable diseases has agreed to a target to reduce physical inactivity across the world by 10% by 2025. The WHO has endorsed a Global Action Plan for the Prevention and Control of Non-Communicable Diseases 2013-2025 in which it has identified proposed actions for member states. These focus on policies and actions across multiple settings and they place an emphasis on children and young people. The WHO identifies physical activity areas for action that are directly relevant to Active Healthy Kids Australia. These include the adoption of national physical activity guidelines. Australia has released new physical activity guidelines for children and young people in March 2014 but is yet to support an implementation strategy or national action plan to advance adoption of the guidelines.

The WHO also calls for nation states to consider establishing a multisectoral national committee or coalition to provide leadership and coordinate national action for increasing physical activity. Australia does not have such a coordinating mechanism at the federal level. Several states do have such mechanisms, for example the NSW Premier's Council for Active Living. Interconnected coordination is vital since there is no single solution to increasing physical activity, or a single sector that can achieve this on its own. An effective comprehensive strategy requires a national plan that considers specific actions that relate closely to the Active Healthy Kids Australia action areas - such as promoting physical activity through active transport, recreation, sport, urban planning and schools. The National Heart Foundation of Australia's, *Blueprint for an Active Australia* provides appropriate high-level Australian advice regarding areas for investment that can support increases in population levels of physical activity.

The International Society for Physical Activity and Health has provided a policy framework for national action on physical activity. The *Toronto Charter for Physical Activity* is a global call to action on physical activity and provides a framework across four areas: (1) implementing a national policy and action plan; (2) introducing policies that support physical activity; (3) reorienting services and funding to prioritise physical activity; and (4) developing partnerships for action.

Governments have a responsibility for ensuring investment of a sustainable funding stream for these actions. A further role for government lies in its support through its agencies such as the Australian Bureau of Statistics, Australian Institute of Health and Welfare and National Health and Medical Research Council, population monitoring and research regarding effective physical activity policies, environments and interventions.

A young child with blonde hair, wearing a green and blue striped shirt and olive green cargo pants, is walking on a paved sidewalk. The child is holding the hand of an adult whose legs and feet are visible. The adult is wearing a dark suit and black shoes. The background is a blurred outdoor setting with trees and a path. The text "GOVERNMENT LEADERSHIP IS VITAL IN ACHIEVING AN INCREASE IN POPULATION PHYSICAL ACTIVITY LEVELS" is overlaid on the right side of the image in white, bold, uppercase letters. A pink horizontal line is positioned above the text.

# **GOVERNMENT LEADERSHIP IS VITAL IN ACHIEVING AN INCREASE IN POPULATION PHYSICAL ACTIVITY LEVELS**



# AEROBIC FITNESS INC

- Comparison of the current levels of aerobic fitness of Australian children and young people against norm-referenced international standards; and
- Proportion of Australian children and young people who have a 'healthy' level of aerobic fitness associated with reduced cardiometabolic risk<sup>127, 128</sup>.

## Rationale

An Incomplete grade was assigned to this indicator given that there were no recent nationally representative fitness data available with which to inform the grade.

## Key Findings

- + Australians aged 8-15 years have below average aerobic fitness relative to norm-referenced international standards, with young Australians ranked in the 31st percentile (range: 22nd to 40th percentile) relative to their age- and sex-matched international peers<sup>22, 129</sup>.
- + 65% of Australian children and young people have a 'healthy' level of aerobic fitness associated with reduced cardiometabolic risk<sup>22</sup>.

## How can we improve the grade?

### Supported by research

- + It is recommended that children and young people accumulate at least 60 minutes of MVPA every day<sup>2</sup>. It is also important they be exposed to prolonged or repeated bouts of strenuous activity to see improvements in aerobic fitness.
- + For real improvement in aerobic fitness, children should perform a variety of enjoyable and age appropriate aerobic activities involving major muscle groups (e.g. walking/running, swimming, cycling, active play/games, dance and sports) as part of their 60 minutes of daily MVPA, as well as some vigorous intensity activity on at least three days per week<sup>2, 130</sup>. Aerobic activities may be performed in one continuous session per day or in multiple sessions of at least 10 minutes to accumulate the recommended amount of daily MVPA<sup>130</sup>.

- + For additional health-related fitness benefits, children and young people should engage in enjoyable and age appropriate muscle and bone strengthening activities on at least three days per week as part of their 60 minutes of daily MVPA<sup>2</sup>. Muscle strengthening activities that are structured (e.g. weight lifting or training with elastic resistance bands) or unstructured (e.g. climbing trees, playing on playground equipment, tug-of-war) and bone strengthening activities (e.g. running, jumping, rope skipping, weight lifting, basketball, football) are recommended<sup>130</sup>.

### Additional recommendations

- + Children and parents need to be made aware of the importance of developing and maintaining a 'healthy' level of aerobic fitness for health benefits now and in the future.

### What do we need to know?

- + In Australia, there have only ever been two national fitness surveys of children and young people, the first in 1969-70 and the most recent in 1985. There has not been a follow-up to the 1985 national survey despite good evidence that the aerobic fitness of young Australians has declined over the past 25-30 years<sup>131</sup>. From a public health standpoint there exists a pressing need for a national fitness survey of Australian children and young people that includes a range of directly measured health-related fitness indicators and health outcomes. This would allow for the tracking of changes in health and fitness measures over time, and provide insight into the links between fitness, body composition, physical activity and a range of cardiometabolic disease risk factors and mental health outcomes.



## What do we need to do?

### How to collect the data

While this indicator is focused on aerobic fitness, given the recently updated Australian physical activity guidelines<sup>2</sup> that recommend that children and young people engage in muscle and bone strengthening activities on at least three days per week, it is advocated that the following standardised measures of aerobic and muscular fitness be routinely employed:

1. The 20 m progressive shuttle run or 'beep test' of aerobic fitness be administered by trained personnel using the Australian Sports Commission<sup>132</sup> protocol<sup>131, 133, 134</sup>; and

2. The standing broad jump test of muscular fitness (explosive muscular strength) be administered by trained personnel using the Pyke<sup>135</sup> protocol<sup>133, 134</sup>.

### How to operationalise the core metric

The core metric used to assess the aerobic fitness levels of Australian children and young people should be:

**Proportion of Australian children and young people who have a 'healthy' level of aerobic fitness associated with reduced cardiometabolic risk, as assessed by the evidence-based criterion-referenced Fitnessgram standards<sup>128</sup>.**

Given that there are no evidence-based criterion-referenced standards for the standing broad jump test with which to benchmark muscular fitness (as there are for aerobic fitness), a core metric is not recommended, although it is recommended that muscular fitness be routinely measured when possible.

## BEYOND THE GRADE

Physical fitness is a very important indicator of how healthy an individual is now and will be in the future. If a person is generally unfit now, then they are more likely to develop conditions like heart disease later in life. People can be fit in different ways – they may be strong like a weightlifter, or flexible like a gymnast, or skillful like a tennis player, but not all of these types of fitness relate well to health. The most important type of fitness for good health is aerobic fitness, which is an individual's ability to exercise vigorously for a long time, like running three or four laps around an oval.

How has the aerobic fitness of young people changed in recent times? Using data on over 25 million 9-17 year olds from 28 countries since 1964, it has been conclusively shown that young people's aerobic fitness has declined worldwide since about 1975<sup>131, 136</sup>. Young people today are about 15% less aerobically fit than their parents were when they were young. On average, young Australians today would finish about 200 m behind their counterparts from 1975 in a 1.6 km (1-mile) run (see Figure 10). To make matters worse, it is likely that the largest declines have occurred in young people with the lowest fitness. Yet there is some good news with evidence of small improvements in the aerobic fitness of young Australians in the past few years<sup>22</sup>.

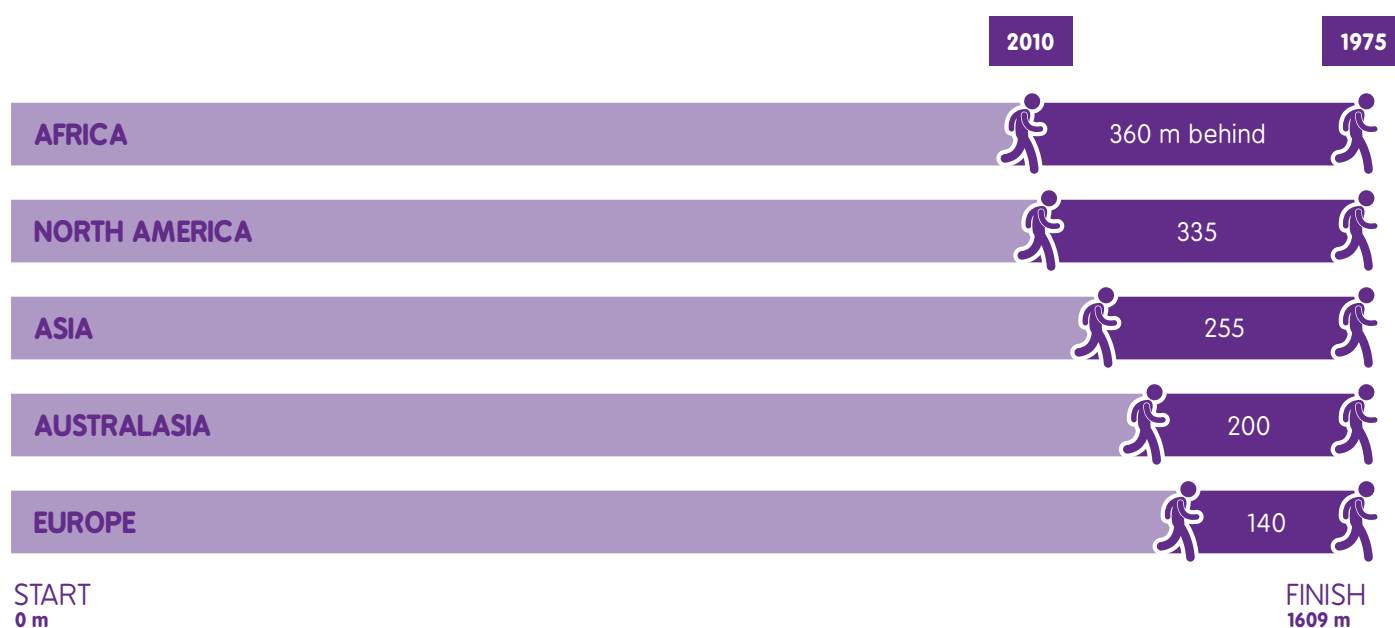


Figure 10.

Geographical differences in the distance (in metres) the average young person from 2010 would finish behind the average young person from 1975 in a long distance run (1609 metres or 1-mile).

# MOVEMENT SKILLS

# INC

- Proportion of Australian children and young people in Grade 6, with at least competent locomotor ability (boys and girls examined separately); and
- Proportion of Australian children and young people in Grade 6, with at least competent object-control ability (boys and girls examined separately).

## Rationale

By the age of 10 (Grade 6)<sup>137</sup> children should have acquired competency in core fundamental movement skills including running, jumping, catching and throwing. An Incomplete was assigned for this indicator given that there were no nationally representative data available to inform the grade.

## Key Findings

- + Grade 6 Australian girls are doing quite poorly with their locomotor (proportion of girls showing at least competent ability – sprint: 44%; vertical jump: 42%; side gallop: 81%; and leap 35%) and object-control (proportion of girls showing at least competent ability – kick: 15%; over-arm throw: 19%; and catch: 58%) competency<sup>22</sup>.
- + Grade 6 Australian boys are doing quite poorly with their locomotor (proportion of boys showing at least competent ability – sprint: 48%; vertical jump: 43%; side gallop: 73%; and leap 18%) competency, however their object-control competency is somewhat better (proportion of boys showing at least competent ability – kick: 59%; over-arm throw: 58%; and catch: 72%)<sup>22</sup>.

## How can we improve the grade?

### Supported by research

- + It is important that classroom teachers and not only primary physical education teachers be qualified to teach movement skills<sup>47</sup>.
- + Parents should be involved in identifying ecologically salient strategies that support the development of movement skills in their children and can be accomplished through engagement with teachers and other professionals<sup>47</sup>.

### Additional recommendations

- + Meaningful development strategies and feedback need to be provided to parents and children with regard to children's movement skill abilities.

## What do we need to know?

- + Australia is in clear need of nationally representative data regarding the movement skill competency of its children and young people. A national survey needs to be implemented in the near future that assesses the movement skill competency of children and young people using a standardised methodology.



## What do we need to do?

### How to collect the data

In order to assess the movement skill competency of Australian children and young people, the standardised methodology that should be employed is: **A movement skill competency assessment battery (locomotor [sprint run, vertical jump, side gallop and leap] and object-control [catch,**

**overhand throw, kick and two-hand strike] skills) using the Get Skilled Get Active process orientated checklist<sup>137</sup> and this should be administered by trained staff.**

### How to operationalise the core metric

The core metrics used to assess the movement skills of Australian children and young people should be:

1. Proportion of Australian Grade 6 children who are competent in locomotor skills (boys and girls examined separately); and
2. Proportion of Australian Grade 6 children who are competent in object-control skills (boys and girls examined separately).

## BEYOND THE GRADE

### How can we expect children to move more if they do not know how?

This Report Card indicates that the physical activity levels of Australian children and young people are low and that sedentary behaviours, particularly screen time, are high. However, how is this expected to change if today's children and young people do not know how to competently run, jump, throw, catch and kick (see Figure 11)? Research has shown that adequately designed and delivered programs aimed at improving movement skills can improve the movement skill competency of children and young people<sup>47</sup>. If we implement more of these programs in schools and the community, is it probable that we will see increases in overall physical activity levels?

A systematic review conducted by Lubans and colleagues<sup>138</sup> concluded that movement skill competency was positively associated with physical activity levels (both subjective and objective measures used) in children and young people. They also found that movement skill competency was positively associated with aerobic fitness and inversely associated with weight status. Figure 11 clearly shows that a large percentage of Grade 6 children do not exhibit competency for both locomotor and object-control movement skills (with very obvious differences between boys and girls, especially for object-control skills). We therefore need to ensure that these important movement skills are introduced at a young age and continue to be reinforced as children age, by implementing more well-developed and delivered physical education curricula in schools and programs throughout the community<sup>47</sup>.

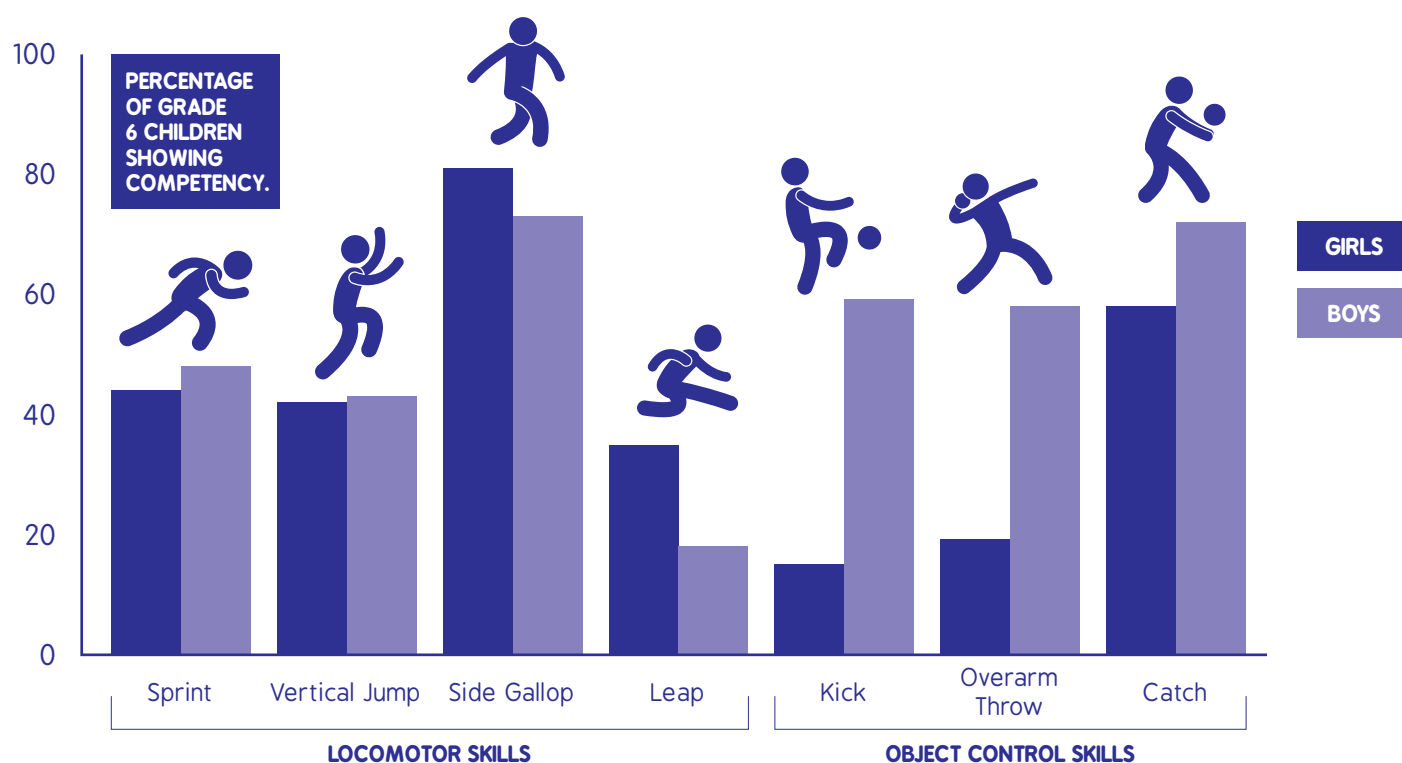


Figure 11.

Percentage of Grade 6 Australian boys and girls showing competency for various locomotor and object-control movement skills.



# SUMMARY OF GRADES

**Table 3. Summary of the grades assigned to each indicator and the metrics used to assign each grade.**

Indicator	Grade	Metrics
Overall PA Levels	<b>D-</b>	Proportion of Australian children and young people meeting the recommended Australian PA guidelines.
Organised Sport and PA Participation	<b>B-</b>	Proportion of Australian children and young people who participate in organised sport and/or PA programs.
PE and PA Participation in Schools	<b>INC</b>	Proportion of Australian children and young people participating in at least 120 minutes per week of PE at school.
Active Play	<b>INC</b>	No consensus on a core metric could be reached.
Active Transportation	<b>D</b>	Proportion of Australian children and young people travelling to and/or from school using active transport (at least once per week).
Sedentary Behaviours	<b>D-</b>	Proportion of Australian children and young people meeting the Australian sedentary behaviour screen time guidelines.
Family and Peers	<b>C</b>	<ul style="list-style-type: none"> <li>• Proportion of Australian children and young people who are reported to have at least one screen-based device in their bedroom;</li> <li>• Proportion of Australian children and young people who receive some form of encouragement from their parents to be physically active on a weekly basis; and</li> <li>• Proportion of Australian adults and mothers/fathers who meet the Australian PA guidelines.</li> </ul>
School	<b>B-</b>	<ul style="list-style-type: none"> <li>• Proportion of schools who have a specialist PE teacher to take PE lessons;</li> <li>• Proportion of schools that deliver at least 120 minutes of PE per week to students;</li> <li>• Proportion of schools that have physical activity facilities/equipment available to students; and</li> <li>• Proportion of schools that allow children to use physical activity equipment/facilities during school hours.</li> </ul>
Community and the Built Environment	<b>A-</b>	<ul style="list-style-type: none"> <li>• Proportion of Australian children/parents who report that there is a playground nearby to their home; and</li> <li>• Proportion of parents who report heavy/problem traffic not to be an issue in their home or school neighbourhood.</li> </ul>
Government Strategies and Investments	<b>C+</b>	<ul style="list-style-type: none"> <li>• Evaluation of a number of major government initiatives (introduced since 2008), whether they were implemented correctly and evaluated appropriately;</li> <li>• The amount of money committed by the government to various physical activity endeavours, initiatives and organisations; and</li> <li>• The work of non-government organisations was also evaluated.</li> </ul>
Aerobic Fitness	<b>INC</b>	<ul style="list-style-type: none"> <li>• Comparison of the current levels of aerobic fitness of Australian children and young people against norm-referenced international standards; and</li> <li>• Proportion of Australian children and young people who have a 'healthy' level of aerobic fitness associated with reduced cardiometabolic risk<sup>127, 128</sup>.</li> </ul>
Movement Skills	<b>INC</b>	<ul style="list-style-type: none"> <li>• Proportion of Australian children and young people in Grade 6, with at least competent locomotor ability (boys and girls examined separately); and</li> <li>• Proportion of Australian children and young people in Grade 6, with at least competent object-control ability (boys and girls examined separately).</li> </ul>

*Note, INC = Incomplete, PA = physical activity, PE = physical education.*

# SUMMARY OF STANDARDISED METHODOLOGIES, QUESTIONS AND CORE METRICS

**Table 4. Summary of the standardised questions and core metrics proposed for each indicator.**

Indicator	Methodologies	Questions	Metrics
Overall PA Levels	Children should be monitored for a 7-day period (using various measurement tools e.g. accelerometers, pedometers) and researchers report their activity time (e.g. minutes MVPA and light physical activity) and/or step counts for each of the 7 days.	Over the past 7 days, on how many days were you/ your child engaged in MVPA (activity that increases heart rate and gets you/your child out of breath some of the time) for at least 60 minutes (can be accumulated over the entire day, for example bouts of 10 minutes) each day?	<ol style="list-style-type: none"> <li>1. Proportion of Australian children and young people meeting the recommended physical activity guidelines* every day; and</li> <li>2. Proportion of days (during the past 7 days) that Australian children and young people meet the recommended physical activity guidelines*.</li> </ol>
Organised Sport and PA Participation	Accelerometers should be worn and observational data collected while children and young people participate in organised sport (both individual and team sports and for training sessions and competitive games), with researchers reporting time children and young people are active (e.g. time spent in MVPA or light physical activity from both accelerometry and/or observations made).	<ol style="list-style-type: none"> <li>1. Have you/has your child participated in organised team sports and/or physical activity (e.g. basketball, football, netball) on a regular basis (1 to 3 times per week for at least 3 months or an entire sporting season) over the past year?; and</li> <li>2. Have you/has your child participated in organised individual sports and/or physical activity (e.g. martial arts, dance) on a regular basis (1 to 3 times per week for at least 3 months or an entire sporting season) over the past year?</li> </ol>	Proportion of Australian children and young people participating in organised team/ individual sports and physical activity during the past 12-month period.
PE and PA Participation in Schools	Accelerometers should be worn and observational data collected while students (in both primary and secondary schools) participate in scheduled physical education classes and are physically active during other periods throughout the school day, with researchers reporting the amount of time they are active (e.g. time spent in MVPA or light physical activity from both accelerometry and/or observations made).	<ol style="list-style-type: none"> <li>1. How many physical education sessions/ classes do you have every week (count double lessons as 2 sessions/classes), not including school sport?; and</li> <li>2. How long do each of the physical education classes/sessions go for?</li> <li>3. What do you usually do<sup>^</sup> during recess time?; and</li> <li>4. What do you usually do<sup>^</sup> during lunchtime?</li> </ol>	<ol style="list-style-type: none"> <li>1. Proportion of Australian children and young people who participate in at least 2 sessions/classes of physical education (not including school sport) every week;</li> <li>2. Proportion of Australian children and young people who participate in at least 120 minutes of physical education (not including school sport) every week; and</li> <li>3. Proportion of Australian children and young people who are active<sup>#</sup> during recess/lunchtime.</li> </ol>

**Table 4. Summary of the standardised questions and core metrics proposed for each grade.**

Indicator	Methodologies	Questions	Metrics
Active Play	Accelerometers should be worn and observational data collected while children and young people (of all ages) are engaged in 'active play', with researchers reporting time the amount of time they are active (e.g. time spent in MVPA or light physical activity from both accelerometry and/or observations made).	<ol style="list-style-type: none"> <li>1. How much time did you/your child spend engaged in 'active play' (any play that is not part of organised physical activity or sport, that is not restricted by extrinsic rules usually set and governed by adults e.g. kicking a ball against the wall, playing a game of tag with friends, watering the plants, or playing on fixed equipment at a park) on average per day over the past 7 days? (preschool and primary school children); and</li> <li>2. How much time did you spend engaged in 'non-organised' physical activity (any physical activity that is not part of organised physical activity or sport, that is not restricted by extrinsic rules usually set and governed by adults e.g. kicking a ball against the wall, watering the plants, doing household chores or running around with your dog at the park) on average per day over the past 7 days? (young people in secondary school).</li> </ol>	As there is not yet a clear definition of 'active play' or guidelines/ recommendations of the amount of 'active play' that should be accumulated by children and young people every day and/or week, there are no suggested core metrics for this indicator.
Active Transportation	N/A	<ol style="list-style-type: none"> <li>1. On how many of the past 5 school days did you/your child travel to (or part of the way<sup>5</sup> to) school by walking, cycling or some other form of active transport?;</li> <li>2. On how many of the past 5 school days did you/your child travel from (or part of the way<sup>5</sup> from) school by walking, cycling or some other form of active transport?; and</li> <li>3. How many times in the past 7 days did you/your child travel from place to place (not including to/from school) or part of the way<sup>5</sup> by walking, cycling or some other form of active transport?</li> </ol>	<ol style="list-style-type: none"> <li>1. Proportion of Australian children and young people using active transport at least part of the way to and/or from school on at least one of the past 5 school days; and</li> <li>2. Proportion of Australian children and young people using active transport at least part of the way from place to place (not including to and/or from school) on at least one of the past 7 days.</li> </ol>
Sedentary Behaviours	Children should be monitored for a 7-day period and researchers report the amount of activity time (e.g. minutes spent sedentary).	<ol style="list-style-type: none"> <li>1. On how many days, during the past 7 days, were you/your child engaged in screen-based (all forms e.g. television, tablets, computers, playstation) activities for entertainment for less than 1 (2-4 years) or 2 (5-17 years) hour/s per day?;</li> <li>2. During the past 7 days, was your child (aged less than 2 years) exposed to any form of screen-based (e.g. television, tablet) activities?; and</li> <li>3. On how many days, during the past 7 days, was your child (0-5 years only) kept inactive or restrained (e.g. stroller, high chair, car seat) for more than 1 hour at any time?</li> </ol>	<ol style="list-style-type: none"> <li>1. Proportion of Australian children and young people meeting the recommended sedentary behaviour (screen) guidelines<sup>2</sup> every day;</li> <li>2. Proportion of days (during the past 7 days) that Australian children and young people meet the recommended sedentary behaviour (for screen) guidelines<sup>2</sup>; and</li> <li>3. Proportion of Australian infants/ toddlers/pre-schoolers meeting the recommended sedentary behaviour (restrained from inactivity) guidelines<sup>2</sup> every day.</li> </ol>



**Table 4. Summary of the standardised questions and core metrics proposed for each grade.**

Indicator	Methodologies	Questions	Metrics
Family and Peers	N/A	<p><b>Infrastructure</b></p> <ol style="list-style-type: none"> <li>1. Do you/does your child have at least one fixed screen-based device (e.g. television, computer) in their bedroom?; and</li> <li>2. Do you/does your child regularly have mobile screen-based devices (e.g. iPad, smart phone, portable game device) in their bedroom?</li> </ol> <p><b>Support</b></p> <ol style="list-style-type: none"> <li>1. On how many days, during the past 7 days, did you receive/did you give your child some form of encouragement to be physically active (e.g. "It is great that you have been playing outside more with your brother/sister this week"?); and</li> <li>2. On how many days, during the past 7 days, did you receive/did you give some form of encouragement from/to your friends or peers to be physically active (e.g. "It's great we are riding to school together from now on")?</li> </ol> <p><b>Parental/peer behaviour</b></p> <ol style="list-style-type: none"> <li>1. During the past 7 days how much moderate (leaving you somewhat tired) and/or vigorous (leaving you substantially tired) physical activity did you engage in (total amount in minutes)?;</li> <li>2. On how many days, during the past 7 days, were you physically active with a parent/with your child?; and</li> <li>3. On how many days, during the past 7 days, were you physically active with a friend or peer?</li> </ol>	<p><b>Infrastructure</b></p> <ol style="list-style-type: none"> <li>1. Proportion of Australian children and young people with at least one screen-based device in their bedroom; and</li> <li>2. Proportion of Australian children and young people who regularly have a mobile screen-based device in their bedroom.</li> </ol> <p><b>Support</b></p> <ol style="list-style-type: none"> <li>1. Proportion of Australian children and young people who receive some form of encouragement from their parents/friends and peers to be physically active at least once per week; and</li> <li>2. Proportion of Australian children and young people who give some form of encouragement to their friends or peers to be physically active at least once per week.</li> </ol> <p><b>Parental/peer behaviour</b></p> <ol style="list-style-type: none"> <li>1. Proportion of Australian adults/parents meeting the recommended physical activity guidelines?; and</li> <li>2. The proportion of Australian children and young people who are physically active with their parents/friends or peers at least once per week.</li> </ol>
School	N/A	<p><b>Infrastructure</b></p> <ol style="list-style-type: none"> <li>1. Does your school have or have access to a gymnasium (or indoor play space)/outside sports field (or grassed area)/hard court (or paved area)/playground/sports (or physical activity) equipment?;</li> <li>2. If available, do you/students have access to a gymnasium (or indoor play space)/outside sports field (or grassed area)/hard court (or paved area)/playground/sports (or physical activity) equipment* during school hours (but outside of scheduled physical education classes)?; and</li> <li>3. On how many days, over the past 5 school days, did you/students use the gymnasium (or indoor play space)/outside sports field (or grassed area)/hard court (or paved area)/playground/sports (or physical activity) equipment* during school hours (but outside of scheduled physical education classes)?</li> </ol> <p><b>Policies</b></p> <ol style="list-style-type: none"> <li>1. Does the school employ a tertiary qualified physical education specialist teacher on a full-time basis?;</li> <li>2. Does a tertiary qualified physical education specialist teacher deliver all scheduled physical education classes for all students?; and</li> <li>3. How much scheduled physical education is delivered to all students on average every week (in minutes)?</li> </ol> <p><b>Programming</b></p> <p>Does your school offer physical activity/sports programs to all students outside of their formal physical education classes?</p>	<p><b>Infrastructure</b></p> <ol style="list-style-type: none"> <li>1. Proportion of schools that have access to a gymnasium (or indoor play space)/outside sports field (or grassed area)/hard court (or paved area)/playground/sports (or physical activity) equipment?;</li> <li>2. Proportion of schools that allow students to use during school hours (but outside of scheduled physical education classes) a gymnasium (or indoor play space)/outside sports field (or grassed area)/hard court (or paved area)/playground/sports (or physical activity) equipment* and</li> <li>3. Proportion of schools at which (if available and students have access to) their gymnasium (or indoor play space)/outside sports field (or grassed area)/hard court (or paved area)/playground/sports (or physical activity) equipment* is used daily by students during school hours (but outside of scheduled physical education classes).</li> </ol> <p><b>Policies</b></p> <ol style="list-style-type: none"> <li>1. Proportion of schools that employ a tertiary qualified physical education specialist teacher on a full-time basis;</li> <li>2. Proportion of schools that have a tertiary qualified physical education specialist teacher deliver all scheduled physical education classes for all students; and</li> <li>3. Proportion of schools that deliver at least 120 minutes per week of scheduled physical education classes to all students.</li> </ol> <p><b>Programming</b></p> <p>Proportion of schools that offer additional physical activity/sports programs to all students outside of their formal physical education classes.</p>

**Table 4. Summary of the standardised questions and core metrics proposed for each grade.**

Indicator	Methodologies	Questions	Metrics
Community and the Built Environment	N/A	<p><b>Infrastructure</b> Is there a playground/park/sports field or facilities* within walking distance of your home?</p> <p><b>Programs</b> My local neighbourhood offers physical activity programs suitable for me/my child - strongly disagree, disagree, neutral, agree, strongly agree.</p> <p><b>Safety</b> 1. There is a lot of traffic in my/my child's neighbourhood/school neighbourhood* – strongly disagree, disagree, neutral, agree, strongly agree; 2. There are safe crossings for me/my child to use if I/they used active transport to travel to school/local playground/local park/local shops/local sports field or facilities* – strongly disagree, disagree, neutral, agree, strongly agree; and 3. I prevent my child from being physically active outdoors in our community, on their own or with friends, because of safety concerns – strongly disagree, disagree, neutral, agree, strongly agree.</p>	<p><b>Infrastructure</b> Proportion of Australian children and young people who have a playground/park/sports field or facilities* within walking distance of their home.</p> <p><b>Programs</b> Proportion of Australian children and young people who are offered suitable physical activity programs within their local neighbourhood (some level of agreement).</p> <p><b>Safety</b> 1. (Proportion of Australian children and young people who have a lot of traffic in their neighbourhood/school neighbourhood* (some level of agreement); 2. Proportion of Australian children and young people who have safe crossings to access if they used active transport to travel to school/local playground/local park/local shops/local sports field or facilities* (some level of agreement); and 3. Proportion of parents who prevent their child from being physically active outdoors in their community, on their own or with friends, because of safety concerns (some level of agreement).</p>
Government Strategies and Investments	No methodologies proposed	No question/s proposed.	No metric proposed.
Aerobic Fitness	1. The 20 m progressive shuttle run or 'beep test' of aerobic fitness be administered by trained personnel using the Australian Sports Commission <sup>132</sup> protocol <sup>131, 133, 134</sup> , and 2. The standing broad jump test of muscular fitness (explosive muscular strength) be administered by trained personnel using the Pyke <sup>135</sup> protocol <sup>133, 134</sup> .	N/A	Proportion of Australian children and young people who have a 'healthy' level of aerobic fitness associated with reduced cardiometabolic risk, as assessed by the evidence-based criterion-referenced Fitnessgram standards <sup>128</sup> .

**Table 4. Summary of the standardised questions and core metrics proposed for each grade.**

Indicator	Methodologies	Questions	Metrics
Movement Skills	A movement skill competency assessment battery (locomotor [sprint run, vertical jump, side gallop and leap] and object-control [catch, overhand throw, kick and two-hand strike] skills) using the Get Skilled Get Active process orientated checklist <sup>137</sup> and this should be administered by trained staff.	N/A	<ol style="list-style-type: none"> <li>1. Proportion of Australian Grade 6 children who are competent in locomotor skills (boys and girls examined separately); and</li> <li>2. Proportion of Australian Grade 6 children who are competent in object-control skills (boys and girls examined separately).</li> </ol>

Note, PA = physical activity, PE = physical education.

\* At least 180 minutes of physical activity (2-4 years)/60 minutes of MVPA (5-17 years) every day OR if pedometers are used at least 12,000 steps every day.

<sup>^</sup> Students would be required to write down what they usually do, these activities could then be categorised as 'active' (walking or vigorous activities) or 'sedentary' (lying, sitting or standing activities).

<sup>#</sup> 'Active' defined as walking or vigorous activities.

<sup>§</sup> Active transport was used for a considerable amount of total travel time.

<sup>></sup> No exposure for <2 years of age, ≤1 hour every day for 2-4 year olds and ≤2 hours for 5-17 year olds.

<sup>?</sup> ≤1 hour of being inactive or restrained at any one time.

<sup><</sup> At least 150 minutes of moderate, 75 minutes of vigorous or an equivalent combination of both moderate/vigorous physical activities each week.

<sup>&</sup> For each question/metric a separate answer/proportion needs to be given for each of the facilities/equipment listed and/or available.

## ABBREVIATIONS

<b>ABS</b>	Australian Bureau of Statistics
<b>AIFS</b>	Australian Institute of Family Studies
<b>ASC</b>	Australian Sports Commission
<b>ASF</b>	Australian Sports Foundation
<b>FaHCSIA</b>	Department of Families, Housing, Community Services and Indigenous Affairs
<b>INC</b>	Incomplete
<b>ISCOLE</b>	International Study of Childhood Obesity, Lifestyle and the Environment
<b>LSAC</b>	Longitudinal Study of Australian Children
<b>MVPA</b>	Moderate to vigorous physical activity
<b>NAPLAN</b>	National Assessment Program – Literacy and Numeracy

<b>NaSSDA</b>	National Secondary Students' Diet and Activity
<b>PA</b>	Physical activity
<b>PE</b>	Physical education
<b>RWG</b>	Research Working Group
<b>SES</b>	Socio-economic status
<b>SPANS</b>	Schools Physical Activity and Nutrition Survey
<b>TV</b>	Television
<b>UK</b>	United Kingdom
<b>US</b>	United States
<b>WHO</b>	World Health Organisation



A photograph of two children, a girl and a boy, running up a stone staircase in a forest. The girl is on the left, wearing a blue long-sleeved shirt and black leggings. The boy is on the right, wearing an orange hoodie and grey sweatpants. They are both seen from behind, running away from the camera. The forest has many trees with green and yellow leaves, suggesting autumn. The ground is covered with fallen leaves.

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The findings and views reported in this paper are those of the author and should not be attributed to the FaHCSIA, the AIFS or the ABS.

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# REFERENCES

- Colley R, Brownrigg M, Tremblay M. A Model of knowledge translation in health: The Active Healthy Kids Canada Report Card on Physical Activity for Children and Youth. *Health Promotion Practice*. 2012;13(3):320-30.
- Department of Health and Aging: National Physical Activity Guidelines for Australians. Canberra: Commonwealth of Australia; 2014.
- Janssen I, LeBlanc A. Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *International Journal of Behavioural Nutrition and Physical Activity*. 2010;7:1-16.
- Okely A, Salmon J, Vella S, Cliff D, Timperio A, Tremblay M, et al. A Systematic Review to update the Australian Physical Activity Guidelines for Children and Young People. Report prepared for the Australian Government Department of Health, June 2012. 2014.
- Strong W, Malina R, Blimke C, Dishman R, Gutin B, Hergenroeder A, et al. Evidence based physical activity for school-age children. *Journal of Pediatrics*. 2005;146:732-7.
- Australian Bureau of Statistics (ABS). Australian Health Survey: Physical Activity, 2011-12. Catalogue No. 4364.0. Canberra: Australian Bureau of Statistics; 2013.
- Australian Bureau of Statistics (ABS). Children's Participation in Sport and Leisure Time Activities, 2003 to 2012. Catalogue No. 4901.0. Canberra: Australian Bureau of Statistics; 2012.
- Australian Institute of Family Studies. Growing Up in Australia, Longitudinal Study of Australian Children (LSAC) 2011: Melbourne.
- National Secondary Students' Diet and Activity (NaSSDA) Survey. Cancer Council Victoria 2010. Available from: <http://www.cancer.org.au/preventing-cancer/nutrition-and-physical-activity/national-secondary-students-diet-and-physical-activity-survey.html>.
- Hands B, Chivers P, Parker H, Bellin L, Kendall G, Larkin D. The associations between physical activity, screen time and weight from 6 to 14 yrs: the Raine Study. *Journal of Science and Medicine in Sport*. 2011;14(5):397-403.
- Graff M, North K, Monda K, Lange E, Lange L, Guo G, et al. The combined influence of genetic factors and sedentary activity on body mass changes from adolescence to young adulthood: the National Longitudinal Adolescent Health Study. *Diabetes/ Metabolism Research and Reviews*. 2011;27:63-9.
- Carson V, Pickett W, Janssen I. Screen time and risk behaviors in 10- to 16-year-old Canadian youth. *Preventive Medicine*. 2011;52(2):99-103.
- Mota J, Ribeiro J, Carvalho J, Santos M, Martins J. Television viewing and changes in body mass index and cardiorespiratory fitness over a two-year period in schoolchildren. *Pediatric Exercise Science*. 2010;22(2):245-53.
- Paananen M, Taimela S, Auvinen J, Tammelin T, Kantomaa M, Ebelling H, et al. Risk factors for persistence of multiple musculoskeletal pains in adolescence: A 2-year follow-up study. *European Journal of Pain*. 2010;14(10):1026-32.
- Schooler D, Trinh S. Longitudinal associations between television viewing patterns and adolescent body satisfaction. *Body Image*. 2011;8(1):34-42.
- Sharif I, Wills T, Sargent J. Effect of visual media use on school performance: A prospective study. *Journal of Adolescent Health*. 2010;46(1):52-61.
- Sund A, Larsson B, Wichstrøm L. Role of physical and sedentary activities in the development of depressive symptoms in early adolescence. *Social Psychiatry and Psychiatric Epidemiology*. 2011;46(5):431-41.
- Viner R, Clark C, Taylor S, Bhui K, Klineberg E, Head J, et al. Longitudinal risk factors for persistent fatigue in adolescents. *Archives of Pediatrics and Adolescent Medicine*. 2008;162(5):469-75.
- Vella S, Cliff D, Magee C, Okely A. Sports participation and parent-reported health-related quality of life in children: Longitudinal associations. *Journal of Pediatrics*. 2014.
- Eime R, Young J, Harvey J, Charity M, Payne W. A systematic review of the psychological and social benefits of participation in sport for children and adolescents: informing development of a conceptual model of health through sport. *International Journal of Behavioral Nutrition and Physical Activity*. 2013;10(98).
- Wickel E, Eisenmann J. Contribution of youth sport to total daily physical activity among 6- to 12-yr-old boys. *Medicine and Science in Sports and Exercise*. 2007;39(9):1493-500.
- Hardy LL, King L, Espinel P, Cosgrove C, Bauman A. NSW Schools Physical Activity and Nutrition Survey (SPANS) 2010: Full Report. Sydney: NSW Ministry of Health. 2010.
- Active Healthy Kids Canada. Are We Driving Our Kids to Unhealthy Habits? The 2013 Active Healthy Kids Canada Report Card on Physical Activity for Children and Youth. Toronto: Active Healthy Kids Canada; 2013.
- Colley R, Janssen I, Tremblay M. Daily Step target to measure adherence to physical activity guidelines in children. *Medicine and Science in Sports and Exercise*. 2012;44(5):977-82.
- Gomersall S, Rowlands A, English C, Maher C, Olds T. The ActivityStat Hypothesis: The concept, the evidence and the methodologies. *Sports Medicine*. 2013;43(2):135-49.
- Trost S, Pate R, Freedson P, Sallis J, Taylor W. Using objective physical activity measures with youth: how many days of monitoring are needed? *Medicine and Science in Sports and Exercise*. 2000;32(2):426-31.
- Olds T, Ridley K, Wake M, Hesketh K, Waters E, Patton G, et al. How should activity guidelines for young people be operationalised? *International Journal of Behavioral Nutrition and Physical Activity*. 2007;4(43).
- Department of Health and Ageing. Australian National Children's Nutrition and Physical Activity Survey: Main findings. Prepared by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the University of South Australia. Canberra, ACT: Department of Health and Ageing. 2008.
- Olds T, Dollman J, Maher C. Adolescent sport in Australia: who, when, where and what? *ACHPER Healthy Lifestyles Journal*. 2009;56(1):11-6.
- Cote J. A cost-benefit analysis of early specialization. In *Pre-Olympic Congress: Sport Science through the Ages 2004*;1:111.
- Wiersma L. Risks and benefits of youth sport specialization: Perspectives and recommendations. *Pediatric Exercise Science*. 2000;12(1):13-22.
- Guagliano J, Rosenkranz R, Kolt G. Girls' Physical activity levels during organized sports in Australia. *Medicine and Science in Sports and Exercise*. 2013;45(1):116-22.
- Martin M, Dollman J, Norton K, Robertson I. A decrease in the association between the physical activity patterns of Australian parents and their children; 1985-1997. *Journal of Science and Medicine in Sport*. 2005;8(1):71-6.
- Booth V. Trends in physical activity among South Australian school children from 1985 to 2013. Adelaide, SA: University of South Australia; 2013.
- Salmon J, Timperio A, Cleland V, Venn A. Trends in children's physical activity and weight status in high and low socio-economic status areas of Melbourne, Victoria, 1985-2001. *Australian and New Zealand Journal of Public Health*. 2005;29(4):337-42.
- Australian Bureau of Statistics. Children's Participation in Organised Sport - 2000, 2003, 2006. Canberra: Australian Bureau of Statistics; 2007.
- Scheerder J, Vanreusel B, Taks M, Renson R. Social stratification patterns in adolescents' active sports participation behaviour: a time trend analysis 1969-1999. *European Physical Education Review*. 2005;11(1):5-27.
- Eiosdóttir S, Kristjánsson Á, Sigfúsdóttir I, Allegrante J. Trends in physical activity and participation in sports clubs among Icelandic adolescents. *European Journal of Public Health*. 2008;18(3):289-93.
- Huhman M, Lowry R, Lee S, Fulton J, Carlson S, Patnode C. Physical activity and screen time: trends in U.S. children aged 9 to 13 years, 2002-2006. *Journal of Physical Activity and Health*. 2012;9(4):508-15.
- Mak K, Day J. Secular trends of sports participation, sedentary activity and physical self-perceptions in Hong Kong adolescents, 1995-2000. *Acta Paediatrica*. 2010;99(11):173-1734.
- Biddle S, Cavill N, Sallis J, editors. *Young and Active? Young people and health-enhancing physical activity-evidence and implications*. London: Health Education Authority; 1998.
- Lonsdale C, Rosenkranz R, Peralta L, Bennie A, Fahey P, Lubans D. A systematic review and meta-analysis of interventions designed to increase moderate-to-vigorous physical activity in school physical education lessons. *Preventive Medicine*. 2013;56(2):152-61.
- Fairclough S, Stratton G. Physical activity levels in middle and high school physical education: A review. *Pediatric Exercise Science*. 2005;17(217):236.
- Morgan P, Hansen V. Classroom teachers' perceptions of the impact of barriers to teaching physical education on the quality of physical education programs. *Research Quarterly for Exercise and Sport*. 2008;79(4):506-16.
- Morgan P, Hansen V. Recommendations to improve primary school physical education: Classroom teachers' perspective. *The Journal of Educational Research*. 2007;101(2):99-112.

46. Audit Office of New South Wales. New South Wales Auditor-General's Report, Performance Audit: Physical Activity in Government Primary Schools, Department of Education and Communities. Audit Office of New South Wales: Sydney, NSW: 2012.
47. Morgan P, Barnett L, Cliff D, Okely A, Scott H, Cohen K, et al. Fundamental movement skill interventions in youth: A systematic review and meta-analysis. *Pediatrics*. 2013;132(5):e1361-e83.
48. Lonsdale C, Rosenkranz R, Sanders T, Peralta L, Bennie A, Jackson B, et al. A cluster randomized controlled trial of strategies to increase adolescents' physical activity and motivation in physical education: Results of the Motivating Active Learning in Physical Education (MALP) trial. *Preventive Medicine*. 2013;57(5):696-702.
49. Yildirim M, Arundell L, Cerin E, Carson V, Brown H, Crawford D, et al. What helps children to move more at school recess and lunchtime? Mid-intervention results from Transform-Us! Cluster-randomised controlled trial. *British Journal of Sports Medicine*. 2014;48(3):271-7.
50. Gibson C, Smith B, DuBose K. Physical activity Across the Curriculum (PAAC) year one processs evaluation results. *International Journal of Behavioral Nutrition and Physical Activity*. 2008;5(36).
51. Stewart J, Dennison D, Kohl H, Doyle J. Exercise level and energy expenditure in the TAKE 10!® in-class physical activity program. *Journal of School Health*. 2004;74(10):397-400.
52. Bartholomew J, Jowers E. Physically active academic lessons in elementary children. *Preventive Medicine*. 2011;52:S51-S4.
53. Riley N, Morgan P, Lubans D. Preliminary findings of the E.A.S.Y. (Encouraging Activity to Stimulate Young) Minds feasibility study: A curriculum-based physical activity integration program in the primary school. *Journal of Science and Medicine in Sport*. 2012;15(Supplement 1):S90.
54. Ridgers N, Stratton G, McKenzie T. Reliability and validity of the system for observing children's activity and relationships during play (SOCARP). *Journal of Physical Activity and Health*. 2010;7(1):74.
55. Lewis N, Dollman J, Dale M. Trends in physical activity behaviours and attitudes among South Australian youth between 1985 and 2004. *Journal of Science and Medicine in Sport*. 2007;10(6):418-27.
56. Faulkner G, Bulling R, Flora P, Fusco C. Active school transport, physical activity levels and body weight of children and youth: A systematic review. *Preventive Medicine*. 2009;48(1):3-8.
57. Lowry R, Brener N, Lee S, Epping J. Participation in high school physical education - United States, 1991-2003. *Morbidity and Mortality Weekly Report*. 2004;53(36):844-7.
58. Clements R. An investigation of the status of outdoor play. *Contemporary Issues in Early Childhood*. 2004;5(1):68-80.
59. Youth Say Project (1974). The recreational priorities of Australian young people: National Youth Council of Australia
60. Connell F. Growing up in an Australian city: A study of adolescents in Sydney. Melbourne: Australian Council for Education Research; 1957.
61. Robertson I. A hindsight perspective about the future of teenagers in physical activity. *Physical Education and Sport*. Adelaide: Department of Education and Training; 2003.
62. Tandy C. Children's diminishing play space: A study of intergenerational change in children's use of their neighbourhoods. *Australian Geographical Studies*. 1999;37(2):154-64.
63. Carver A, Timperio A, Hesketh K, Crawford D. Are safety-related features of the road environment associated with smaller declines in physical activity among youth? *Journal of Urban Health*. 2010;87(1):29-43.
64. Hume C, Timperio A, Salmon J, Carver A, Giles-Corti B, Crawford D. Walking and cycling to school: predictors of increases among children and adolescents. *American Journal of Preventive Medicine*. 2009;36(3):195-200.
65. Trapp G, Giles-Corti B, Christian H, Bulsara M, Timperio A, McCormack G, et al. On your bike! A cross-sectional study of the individual, social and environmental correlates of cycling to school. *International Journal of Behavioral Nutrition and Physical Activity*. 2011;8(123).
66. Trapp G, Giles-Corti B, Christian H, Bulsara M, Timperio A, McCormack G, et al. Increasing children's physical activity: Individual, social, and environmental factors associated with walking to and from school. *Health Education & Behavior*. 2012;39(2):172-82.
67. Giles-Corti B, Wooda G, Pikora T, Learnihan V, Bulsara M, VanNiel K, et al. School site and the potential to walk to school: The impact of street connectivity and traffic exposure in school neighborhoods. *Health and Place*. 2011;17(2):545-50.
68. Timperio A, Ball K, Salmon J, Roberts R, Giles-Corti B, Simmons D, et al. Personal, family, social, and environmental correlates of active commuting to school. *American Journal of Preventative Medicine*. 2006;30(1):45-51.
69. Wong B, Faulkner G, Bulling R. GIS measured environmental correlates of active school transport: A systematic review of 14 studies. *International Journal of Behavioral Nutrition and Physical Activity*. 2011;8(39).
70. van der Ploeg H, Merom D, Corpuz G, Bauman A. Trends in Australian children travelling to school 1971-2003: Burning petrol or carbohydrates? *Preventive Medicine*. 2008;46(1):60-2.
71. Lobby AB. Issue sheet: Lack of mobility of children in Australia 2001 [cited 2003 March 21]. Available from: <http://www.australianbicyclelobby.com/issues.php>.
72. Costa F, Silva K, Schmoelz C, Campos V, de Assis M. Longitudinal and cross-sectional changes in active commuting to school among Brazilian schoolchildren. *Preventive Medicine*. 2012;55(3):212-5.
73. Rock C. Changes in travel behaviour in greater Vancouver 1985-94 1997 [cited 2004 February 24]. Available from: [http://www.citebc.ca/Feb97\\_GVRD\\_Tr.html](http://www.citebc.ca/Feb97_GVRD_Tr.html).
74. Grize L, Bringolf-Isler B, Martin E, Braun-Fahrlander C. Trend in active transportation to school among Swiss school children and its associated factors: three cross-sectional surveys 1994, 2000 and 2005. *International Journal of Behavioral Nutrition and Physical Activity*. 2010;7(1):28-35.
75. Black C, Collins A, Snell M. Encouraging walking: The case of journey-to-school trips in compact urban areas. *Urban Studies*. 2001;38:1121-41.
76. Mackett R, Robertson S. Potential for mode transfer of short trips: Review of existing data and literature sources. University College, London: Centre for Transport Studies; 2000.
77. Scotland T. Scottish transport statistics No. 32 2013 [cited 2014 March 5]. Available from: <http://www.transportscotland.gov.uk/strategy-and-research/publications-and-consultations/j285663-00.htm>.
78. Ham S, Martin S, Kohl III H. Changes in the percentage of students who walk or bike to school - United States, 1969 and 2001. *Journal of Physical Activity and Health*. 2008;5(2):205-15.
79. McDonald N, Brown A, Marchetti L, Pedrosa M. U.S. school travel, 2009: An assessment of trends. *American Journal of Preventive Medicine*. 2011;41(2):146-51.
80. Zubrick S, Wood L, Villanueva K, Wood G, Giles-Corti B, Christian H. Nothing but fear itself: Parental fear as a determinant of child physical activity and independent mobility. Melbourne: Victorian Health Promotion Foundation (VicHealth), 2010.
81. Sigman A. Time for a view on screen time. *Archives of Disease in Childhood*. 2012;97(11):935-42.
82. Straker L, Maslen B, Burgess-Limerick R, Johnson P, Dennerlein J. Evidence-based guidelines for the wise use of computers by children: Physical development guidelines. *Ergonomics*. 2010;53(4):458-77.
83. Straker L, Abbott R, Collins R, Campbell A. Evidence-based guidelines for wise use of electronic games by children. *Ergonomics*. 2014;in press (accepted 12th Feb 2014).
84. Rey-Lopez J, Vicente-Rodriguez G, Ortega F, Ruiz J, Martinez-Gomez D, de Henauf S, et al. Sedentary patterns and media availability in European adolescents: The Helena Study. *Preventive Medicine*. 2010;51(1):50-5.
85. Lubans D, Lonsdale C, Plotnikoff R, Smith J, Dally K, Morgan P. Development and evaluation of the Motivation to Limit Screen-time Questionnaire (MLSQ) for adolescents. *Preventive Medicine*. 2013;57(5):561-6.
86. Abbott R, Straker L, Mathiassen S. Patterning of children's sedentary time at and away from school. *Obesity*. 2013;21:E131-E3.
87. Loucaides C, Jago R, Charalambous I. Promoting physical activity during school break times: Piloting a simple, low cost intervention. *Preventive Medicine*. 2009;48:332-4.
88. Groffik D, Sigmund E, Fromel K, Chmelik F, Novakova Lokvencova P. The contribution of school breaks to the all-day physical activity of 9- and 10-year-old overweight and non-overweight children. *International Journal of Public Health*. 2012;57:711-8.
89. Salmon J, Arundell L, Hume C, Brown H, Hesketh K, Dunstan D, et al. A cluster-randomized controlled trial to reduce sedentary behavior and promote physical activity and health of 8-9 year olds: The Transform-Us! Study. *BMC Public Health*. 2011;11:759.
90. Barr-Anderson D, AuYoung M, Whitt-Glover M, Glenn B, Yancey A. Integration of short bouts of physical activity into organizational routine: A systematic review of the literature. *American Journal of Preventive Medicine*. 2011;40(1):76-93.



91. Donnelly J, Greene J, Gibson C, Smith B, Washburn R, Sullivan D, et al. Physical Activity Across the Curriculum (PAA): A randomized controlled trial to promote physical activity and diminish overweight and obesity in elementary school children. *Preventive Medicine*. 2009;49(4):336-41.
92. Foehr U. Media multitasking between American youth: prevalence, predictors and pairings. Menlo Park, California: The Kaiser Family Foundation; 2006.
93. Taverno R, Dowda M, Saunders R, Pate R. Double dose: The cumulative effect of TV viewing at home and in preschool on children's activity patterns and weight status. *Pediatric Exercise Science*. 2013;25(2):262-72.
94. Atkin A, Gorely T, Clemes S, Thomas Yates T, Edwardson C, Brage S, et al. Methods of measurement in epidemiology: Sedentary behaviour. *International Journal of Epidemiology*. 2012;41(5):1460-71.
95. Epstein L, Roemmich J, Robinson J, Paluch R, Winiewicz D, Fuercg J, et al. A randomized trial of the effects of reducing television viewing and computer use on body mass index in young children. *Archives of Pediatrics and Adolescent Medicine*. 2008;162(3):239-45.
96. Straker L, Pollock C, Piek J, Abbot R, Skoss R, Coleman J. Active-input provides more movement and muscle activity during electronic game playing by children. *International Journal of Human-Computer Interaction* 2009;25(8):713-28.
97. Hamilton M, Healy G, Dunstan D, Zderic T, Owen N. Too little exercise and too much sitting: Inactivity physiology and the need for new recommendations on sedentary behavior. *Current Cardiovascular Risk Reports*. 2008;2(4):292-8.
98. Morgan PJ, Collins CE, Plotnikoff RC, Callister R, Burrows T, Fletcher R, et al. The 'Healthy Dads, Healthy Kids' community randomized controlled trial: A community-based healthy lifestyle program for fathers and their children. *Preventive Medicine*. 2013;61:90-9.
99. Australian Bureau of Statistics. Year Book Australia, 2012 (Cat. No. 1301.0). Canberra: ABS; 2012.
100. Hugo G. A century of population change in Australia (ABS - Yearbook 2001 Australia (Catalogue. no. 1301.0)). Canberra: ABS; 2001.
101. Australian Bureau of Statistics. 2006 Census of Population and Housing: Census tables (Cat. No. 2068.0). Canberra: ABS; 2007.
102. Commonwealth Bureau of Census and Statistics. Year book of the Commonwealth of Australia (No. 51). Canberra: Commonwealth Bureau of Census and Statistics; 1965.
103. Australian Bureau of Statistics. Births Australia, 1980 (Cat. No. 3301.0). Canberra: ABS; 1981.
104. Lancaster P, Huang J, Pedisich E. Australia's mothers and babies 1991 (Perinatal Statistics Series No. 1). Sydney: Australian Institute of Health and Welfare, National Perinatal Statistics Unit; 1994.
105. Australian Bureau of Statistics. Births, Australia (Cat. No. 3301.0). Canberra: ABS.: various years.
106. Commonwealth Bureau of Census and Statistics. Demography 1969 and 1970 (Bulletin No. 86). Canberra: Commonwealth Bureau of Census and Statistics; 1973.
107. Australian Bureau of Statistics. Marriages and Divorces Australia (Catalogue no. 3310.0). Canberra: ABS; various years.
108. Australian Bureau of Statistics. Divorces Australia (Catalogue No. 3307.0, 3307.0.55.001). Canberra: ABS: various years.
109. Commonwealth Bureau of Census and Statistics. Demography 1963 (Bulletin No. 81). Canberra: Commonwealth Bureau of Census and Statistics; 1964.
110. Australian Bureau of Statistics. Labour Force Status and other Characteristics of Families, Australia (Cat. No. 6224.0). Canberra: ABS: various years.
111. Australian Bureau of Statistics. Census of Population and Housing: Census tables (Cat. No. 2901.0). Canberra: ABS; 2011.
112. Laws P, Sullivan E. Australia's mothers and babies 2007 (Perinatal Statistics Series No. 23; Cat. No. PER 48). Sydney: Australian Institute of Health and Welfare, National Perinatal Statistics Unit; 2009.
113. Li Z, Zeki R, Hilder L, Sullivan E. Australia's mothers and babies 2011 (Perinatal statistics series no. 28). Canberra: Australian Institute of Health and Welfare; 2013.
114. Robertson-Wilson J, Dargavel M, Bryden P, Giles-Corti B. Physical activity policies and legislation in schools: A systematic review. *American Journal of Preventive Medicine*. 2012;43(6):643-9.
115. Katzmarzyk P, Barreira T, Broyles S, Champagne C, Chaput J, Fogelholm M, et al. The International Study of Childhood Obesity, Lifestyle and the Environment (ISCOLE): Design and methods. *BMC Public Health*. 2013;13:900.
116. Veitch J, Salmon J, Ball K. Children's Perceptions of the use of public open spaces for active freeplay. *Children's Geographies*. 2007;5(4):409-22.
117. Ding D, Sallis J, Kerr J, Lee S, Rosenberg D. Neighborhood environment and physical activity among youth: A review. *American Journal of Preventive Medicine*. 2011;41(4):442-55.
118. Harten N, Olds T. Patterns of active transport in 11-12 year old Australian children. *Australian and New Zealand Journal of Public Health*. 2004;28:159-64.
119. Australian Government: Department of Health. National Partnership Agreement on Preventive Health: Commonwealth of Australia; 2013 [cited 2014 27 March]. Available from: <http://www.health.gov.au/internet/main/publishing.nsf/Content/phd-prevention-np>.
120. Australian Government: National Preventative Health Taskforce. Australia: The Healthiest Country by 2020 - National Preventative Health Strategy - the roadmap for action. In: National Preventative Health Taskforce, editor. Canberra, ACT: Commonwealth of Australia; 2009.
121. Australian Government: Department of Health and Ageing. Get set 4 Life: Habits for Healthy Kids. In: Department of Health and Ageing, editor. Canberra, ACT: Commonwealth of Australia; 2008.
122. Australian Government: Department of Health and Ageing. Get Set 4 Life - Habits for Healthy Kids Guide: Commonwealth of Australia; 2013 [cited 2014 27 March]. Available from: [https://www.health.gov.au/internet/main/publishing.nsf/Content/Health\\_Kids\\_Check\\_GetSet4Life+Guide](https://www.health.gov.au/internet/main/publishing.nsf/Content/Health_Kids_Check_GetSet4Life+Guide).
123. Australian Government: Australian Sports Commission. Active After-school Communities: Australian Sports Commission; 2014 [cited 2014 27 March]. Available from: <http://www.ausport.gov.au/participating/aasc>.
124. Healthy Spaces and Places. Healthy Spaces and Places: Healthy Spaces and Places; 2014 [cited 2014 27 March]. Available from: <http://www.healthyplaces.org.au/site/index.php>.
125. Centre for Epidemiology and Evidence. 2009-2010 Summary Report from the New South Wales Child Health Survey. Sydney: NSW Ministry of Health; 2012.
126. Jolly R. Sports funding: Federal balancing act. Parliamentary Library: Information Analysis Advice Commonwealth of Australia; 2013.
127. Lobelo F, Pate R, Dowda M, Liese S, Ruiz J. Validity of cardiorespiratory fitness criterion-referenced standards for adolescents. *Medicine and Science in Sports and Exercise*. 2009;41(6):1222-9.
128. The Cooper Institute. Fitnessgram and Activitygram test administration manual (updated 4th ed.). Champaign, IL: Human Kinetics; 2010.
129. Olds T, Tomkinson G, Léger L, Cazorla G. Worldwide variation in the performance of children and adolescents: An analysis of 109 studies of the 20 m shuttle run test in 37 countries. *Journal of Sport Sciences*. 2006;24(10):1025-38.
130. American College of Sports Medicine. ACSM's guidelines for exercise testing and prescription (9th ed.). Baltimore, MA: Lippincott Williams & Wilkins; 2014.
131. Tomkinson G, Olds T. Secular changes in pediatric aerobic fitness test performance: The global picture. *Medicine and Sport Science*. 2007;50:46-66.
132. Australian Sports Commission. 20m shuttle run test: a progressive shuttle run test for measuring aerobic fitness. Belconnen (ACT): Australian Coaching Council; 1999.
133. Ruiz J, Castro-Piñero J, España-Romero V, Artero E, Ortega F, Cuenca M, et al. Field-based fitness assessment in young people: the ALPHA health-related fitness test battery for children and adolescents. *British Journal of Sports Medicine*. 2011;45(6):518-24.
134. Institute of Medicine. Fitness measures and health outcomes in youth. Washington, DC The National Academies Press; 2012.
135. Pyke J. Australian health and fitness survey 1985: The fitness, health and physical performance of Australian school students aged 7-15 years. Parkside, SA: The Australian Council for Health, Physical Education and Recreation; 1987.
136. Armstrong N, Tomkinson G, Ekelund U. Aerobic fitness and its relationship to sport, exercise training and habitual physical activity during childhood and adolescence. *British Journal of Sports Medicine*. 2011;45:849-58.
137. NSW Department of Education and Training. Get skilled: Get active. A K-6 resource to support the teaching of fundamental movement skills. Ryde, NSW: NSW Department of Education and Training; 2000.
138. Lubans D, Morgan P, Cliff D, Barnett L, Okely A. Fundamental movement skills in children and adolescents: Review of associated health benefits. *Sports Medicine*. 2010;40(12):1019-35.



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