

# 2022 INDIA REPORT CARD ON PHYSICAL ACTIVITY FOR CHILDREN & ADOLESCENTS



# 2022 RESEARCH WORKING GROUP

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The 2022 India Report Card was led by Active Healthy Kids India, a non-profit organization dedicated to the promotion of active living research and policy among Indian children and youth ([www.activehealthykidsindia.com](http://www.activehealthykidsindia.com)). Partner organizations which contributed to the Report Card development and evidence synthesis were the Digital Epidemiology and Population Health (DEPtH) Laboratory at Western University, and the CHANGE Research Lab based at Toronto Metropolitan University.

## ACKNOWLEDGEMENTS

The 2022 India Report Card is funded by the Canada Research Chairs Program. Dr. Anuradha Khadilkar's team in Pune, India was instrumental in obtaining primary data to evaluate several indicators of active living. The Report Card team acknowledges DEPtH Lab trainees, Prasanna Kannan and Eric Kwabia, for their contributions to the literature search and data analysis, and Dr. Nour Hammami for her support with data analysis. A special thanks to Nadine Elsahli for her role in the design and assembly of the Report Card.

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## INTRODUCTION: 2022 INDIA REPORT CARD

High levels of physical inactivity and sedentary behaviour among Indian children and adolescents<sup>1,2</sup> has global implications, as Indian youth comprise a significant proportion of the world's workforce.<sup>3,4</sup> With strong evidence of physical inactivity's link to disease and economic burden,<sup>5</sup> and with active living behaviours in childhood tracking into adulthood,<sup>6</sup> it is imperative to promote active living among children and adolescents in India. Answering this call, we generated the "2016 Report Card on physical activity for children and youth" to not only depict patterns of active living, but also to identify investments, policies, and programs that drive the physical and social environments within which children and youth accumulate physical activity.<sup>1</sup>

The 2016 India Report Card concluded that most Indian children do not achieve recommended levels of physical activity and spend most of their day in sedentary pursuits. The report also identified gaps in both investments and research to be addressed before understanding the complete picture of active living among children and youth in India. To reassess patterns of active living among Indian children and youth, two years after releasing the 2016 Report Card, we developed the 2018 India Report Card on physical activity for children and youth.<sup>2</sup>

The 2018 India Report Card addressed most of the evidence gaps identified in 2016; however, it reiterated the need for nationally representative active living research, as well as renewed government strategies and investments to facilitate active living. As part of this initiative, Active Healthy Kids India,<sup>7</sup> a non-profit organization was established to advocate for active living among children and youth in India.

Active Healthy Kids India continues to invest in active living initiatives in India. The 2022 India Report Card, which evaluates active living patterns and contexts among Indian children and adolescents, is a collaboration between Active Healthy Kids India and the Active Healthy Kids Global Alliance.<sup>8</sup> Based on the evidence-based criteria developed by the Active Healthy Kids Global Alliance,<sup>9,10</sup> and taking into account the cultural components specific to India (i.e., yoga), this study includes the grades assigned to 11 active living indicators, including behavioral measures (overall physical activity, organized sport participation, active play, active transportation, sedentary behavior, yoga), and environmental influences (family and peers, school, community and the built environment, and government strategies and investments). The ultimate goal of the 2022 India Report Card is to not only catalyze post-pandemic active living efforts for children and adolescents in India, but also to translate this knowledge across the 57 countries participating in this initiative.<sup>11</sup>



## METHODS

### REPORT CARD DEVELOPMENT

The 2022 India Report Card on Physical Activity for Children and Adolescents is part of Global Matrix 4.0, an international endeavour to evaluate various aspects of active living in 57 countries across six continents.<sup>12</sup> As part of this initiative, country-specific teams appraised current evidence using rigorous methods, and assigned standardized grades to previously developed indicators of active living.<sup>13</sup> The India Report Card is an independently developed, scientific report that assesses physical activity, sedentary behaviour, and multiple contextual factors that impact these behaviours in Indian children and adolescents.

<b>57</b> COUNTRIES	<b>6</b> CONTINENTS	<b>570</b> GRADES
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The 2022 India Report Card Research Working Group (RWG) was comprised of five experts in physical activity, child health, and health policy from five universities and institutions. The RWG appraised 11 indicators of physical activity: Overall Physical Activity; Organized Sport Participation; Active Play; Active Transportation; Sedentary Behaviour; Physical Fitness; Family and Peers; School; Community and the Built Environment; Government Strategies; Policies and Investments; Yoga.<sup>13</sup>












Members of the RWG collated and evaluated available evidence published since the 2018 Report Card (November 1, 2018 to April 1, 2022) on physical activity among children and youth aged 5 to 17 years in India. A systematic search of peer-reviewed and grey literature was conducted for the 11 indicators of active living. Peer-reviewed literature was identified through the PubMed and Web of Science databases, and the grey literature search included tailored Google searches for each indicator. Specific searches of Government and Ministry websites, physical activity and health-focused non-profit organizations, school board websites, and national program websites were conducted.

Data were appraised for the peer-reviewed portion of the literature search by two reviewers who screened titles and abstracts, selected relevant articles, and reached consensus on a final shortlist after reviewing full articles. Unpublished data were also obtained from key stakeholders and included in the final analysis. Peer-reviewed articles were appraised based on national representativeness, sample size, and data quality. Grey literature was appraised based on comprehensiveness, validity of the sources, and representativeness. Nationally representative peer-reviewed articles and primary data were given higher weightage, followed by non-nationally representative (state or city-level data) peer-reviewed articles and unpublished data, and grey literature. All indicators were assessed against parameters provided by Active Healthy Kids Global Alliance,<sup>12,13</sup> with the exception of yoga, which is an indicator introduced by the RWG in 2018 to capture a key cultural component of physical activity in India.

### GRADING RUBRIC

GRADE	BENCHMARK	DEFINITION
A+	94 - 100%	We are succeeding with a large majority of children and adolescents
A	87 - 93%	
A-	80 - 86%	
B+	74 - 79%	We are succeeding with well over half of children and adolescents
B	67 - 73%	
B-	60 - 66%	
C+	54 - 59%	We are succeeding with about half of children and adolescents
C	47 - 53%	
C-	40 - 46%	
D+	34 - 39%	We are succeeding with less than half, but some, children and adolescents
D	27 - 33%	
D-	20 - 26%	
F	<20%	We are succeeding with very few children and adolescents
INC	Incomplete—insufficient or inadequate information to assign a grade	

## SUMMARY OF REPORT CARD INDICATORS AND GRADES

INDICATOR		GRADE
	<p><b>Overall Physical Activity</b> The proportion (%) of children and youth who meet global physical activity guidelines which recommend accumulating at least 60 minutes of moderate- to vigorous-intensity physical activity per day on average. When an average could not be estimated, the % of children and youth who met the guidelines at least 4 days a week was considered.</p>	<b>C*</b>
	<p><b>Organized Sport Participation</b> The proportion (%) of children and youth who participate in organized sport and/or physical activity programs.</p>	<b>INC</b>
	<p><b>Active Play</b> The proportion (%) of children and youth who engage in unstructured or unorganized active play at any intensity for more than 2 hours per day, or report being outdoors for more than 2 hours per day.</p>	<b>INC</b>
	<p><b>Active Transportation</b> The proportion (%) of children and youth who walk or bike to different destinations (e.g. home, school, park, friend's house).</p>	<b>B-</b>
	<p><b>Sedentary Behaviour</b> The proportion (%) of children and youth who meet the Canadian Sedentary Behaviour Guidelines, which recommend no more than 2 hours of recreational screen time per day.</p>	<b>D</b>
	<p><b>Family and Peers</b> The proportion (%) of parents or guardians who facilitate physical activity and sport opportunities for children (i.e., coaching, driving, volunteering), meet the global physical activity guidelines for adults, and are physically active with their children. The % of children and youth whose friends or peers encourage and support them to be physically active.</p>	<b>INC</b>
	<p><b>School – Infrastructure, Policies and Programs</b> The proportion (%) of schools with active school policies; physical education (PE) taught by a PE specialist; offering the mandated amount of PE by the state/country; offering physical activity opportunities to the majority of students; providing regular access to facilities and equipment which support physical activity (i.e., gymnasium, playgrounds, sporting fields, bike racks, etc.). The % of parents/guardians reporting that children have access to physical activity opportunities at school in addition to PE.</p>	<b>C</b>
	<p><b>Community and the Built Environment</b> The proportion (%) of children, youth, or parents/guardians who perceive their community as supportive for physical activity. The % of communities reporting physical activity policies and infrastructure (e.g. sidewalks, trails, bike lanes). The % of children or parents/guardians who report having facilities, programs, parks and playgrounds; living in a safe neighbourhood where they can be physically active; and well-maintained activity facilities in the community.</p>	<b>D</b>
	<p><b>Government – Strategies, Policies and Investments</b> Demonstrated leadership, investments, and evidence of implementation of physical activity strategies targeting children and youth (e.g. policy agenda, policy formation, policy implementation, policy evaluation and decisions about the future).</p>	<b>C+</b>
	<p><b>Physical Fitness</b> The proportion (%) of children and youth performing well in several fitness tests and exercise regimens meant to test physical fitness, including: cardio respiratory endurance, muscular strength, muscular endurance, flexibility, explosive strength, and body composition.</p>	<b>INC</b>
	<p><b>Yoga</b> The proportion (%) of children and youth who practice any form of yoga (e.g. hatha, ashtanga) daily at home or school.</p>	<b>D-*</b>

# PHYSICAL ACTIVITY AND SEDENTARY BEHAVIOUR GUIDELINES

Physical activity and sedentary behaviour guidelines provide recommendations for the amount of time that children and adolescents should spend daily in active and sedentary activities to improve health outcomes and reduce health risks.

## PHYSICAL ACTIVITY GUIDELINES

### *Up to 5 Years*

For infants (birth to one year) to have healthy growth and development, physical activity should be encouraged from birth. Among infants, physical activity includes supervised floor-based play in safe environments. Toddlers (1 to 3 years) and preschool-aged children (3 to 5 years) should accumulate at least three hours of physical activity per day.

### *5 to 17 Years*

Children and youth aged 5 to 17 years should accumulate at least 60 minutes of moderate-to-vigorous-intensity physical activity daily. Moderate-to-vigorous physical activity (MVPA) encompasses a wide variety of activities that could range from a brisk walk to intensive exercise, such as running. Most of the daily physical activity should be aerobic. When possible, vigorous intensity activities should be incorporated, including activities that strengthen muscle and bone, at least 3 times per week.

These recommendations are relevant to all children between 5 and 17 years, unless specific medical advice indicates otherwise. The concept of accumulation refers to meeting the goal of 60 minutes per day by performing activities in multiple shorter bouts spread throughout the day (e.g. two bouts of 30 minutes), then adding together the time spent during each of these bouts.

## SEDENTARY BEHAVIOUR GUIDELINES

Sedentary behaviour refers to any waking activity characterized by an energy expenditure  $\leq 1.5$  metabolic equivalents and a sitting or reclining posture. Common sedentary behaviours include television viewing, playing video games, computer use (collectively termed “screen time”), driving automobiles, and reading.

### *Up to 5 Years*

For those under 2 years of age, screen time (e.g., TV, computer, electronic games) is not recommended. For children between 2 to 4 years, screen time should be limited to under one hour per day.

### *5 to 17 Years*

For children and youth aged 5 to 17 years, recreational screen time should be limited to no more than 2 hours per day. Sedentary transport, extended sitting time, and time spent indoors, should also be limited throughout the day, and regular breaks from sedentary behaviour are encouraged.





The C grade indicates that approximately half of children and youth are meeting physical activity guidelines.

## OVERALL PHYSICAL ACTIVITY

**GRADING CRITERIA:** The proportion of children and youth accumulating 60 minutes or more of moderate-to-vigorous physical activity daily.

Overall Physical Activity refers to the proportion of children and adolescents meeting physical activity guidelines.<sup>13</sup> Evidence from 27 states in India, including urban and rural jurisdictions with a sample size of 3808 children and adolescents across studies, was assessed to determine overall PA. A study conducted across 27 states in India among 15-17 year old youth (n=1531) found that, on average, 25.2% of adolescents had insufficient levels of physical activity (i.e., in accordance with MVPA guidelines).<sup>14</sup> The survey-based data found that a higher proportion of urban residents were insufficiently physically active (38%), as well as girls (29.3%) in the sample. A total of 64.3% reported doing physical activity in schools, and spent an average of 16.1 minutes per day. Overall, 72% of the sample accumulated at least 60 minutes of physical activity, however this included light physical activity such as housework. A study in Chennai, India collected objective physical activity data using accelerometers among adolescents (n=324).<sup>15</sup> Adolescents accumulated an average of 25.8 minutes of MVPA daily. Another study among 10-15-year-old youth (n=772) in Mumbai reported on physical activities using a survey. The majority (62%) reported not meeting MVPA guidelines, and only 38% met guidelines. Approximately 64% of girls and 60.2% of boys did not meet MVPA guidelines.<sup>16</sup> A study conducted with 11-13 year olds (n=139) in Tamil Nadu found that only 31.7% of children met the MVPA guidelines of 60 minutes/day.<sup>17</sup>

In addition to these peer-reviewed studies, primary data collected from children and youth aged 5 to 17 in urban and rural Pune (n=1042) found that 45.8% engaged in MVPA 6 or more times per week for at least 60 minutes each session. Urban participants had

## WHY IS OVERALL PHYSICAL ACTIVITY IMPORTANT?

Habits and behaviours developed in childhood persist into adulthood, thus children and youth who are active are more likely to become active adults. Regular physical activity can reduce the risk of numerous illnesses such as cardiovascular diseases, metabolic syndrome, colon and breast cancer, and depression.<sup>18,19</sup> Physical activity can also help control weight, improve mood, and increase life expectancy.<sup>14,15</sup>



slightly higher likelihood of meeting MVPA guidelines (49.6%) compared to rural (45.8%) daily. Significant gender differences were found, with 35.6% of females meeting MVPA guidelines compared to 45.8% of males.

The overall evidence suggests that approximately half of children and adolescents are meeting the minimum recommendation of 60 minutes of MVPA per day, resulting in a C grade. The asterisk denotes that there are significant gender differences across studies, with boys more likely to meet MVPA guidelines than girls, thus this weighted average does not reflect differences based on gender.

## ORGANIZED SPORT PARTICIPATION

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**GRADING CRITERIA:** The proportion of children and youth involved in any organized sports programming provided through schools or communities.

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Organized sports include physical activities that are structured, goal-oriented, competitive and contest-based.<sup>13</sup> Organized sport participation includes involvement in any programming provided through schools or communities that enables children and youth to participate in sports.

A study conducted in a rural area of Mathura, Uttar Pradesh found that 90.7% of participants were engaged in some sport.<sup>20</sup> Gender-based differences in sport included a greater proportion of boys playing cricket (74.2%), whereas girls were more likely to engage in “physical exercises” (50%) such as resistance or muscle strengthening exercises.<sup>20</sup>

A grey literature search uncovered a lengthy list of organizations dedicated to organized sport among

## WHY DOES ORGANIZED SPORT PARTICIPATION MATTER?

For many children and youth, organized sport participation is a fun way to be physically active with peers. While not all families may be able to afford extracurricular organized sports activities, programs offered through schools are more accessible to children and youth, and therefore an important part of overall physical activity accumulation.

children and youth across India (e.g., Khelo India, Fit India Movement); however, organizational reports located on the websites did not provide publicly available evidence of the reach, uptake, or effectiveness of these programs.

Primary data collected from children and youth aged 5 to 17 years in urban and rural Pune found that 77.5% of children and youth reported participation in organized sports (n=558), with 59.1% of participants engaging in competitive school organized activities against other schools.

Despite some evidence of organized sport participation among children and adolescents across India, this indicator receives an incomplete grade as the data are not representative, and there is no evaluation of state-wide or national programs to enable grading of this indicator.



**GRADE INC**

The grade of incomplete (INC) indicates that there was insufficient information available to assess this indicator.

**ACTIVE PLAY**

**GRADING CRITERIA:** The proportion of children and youth engaged in unstructured, unorganized active play either indoors or outdoors for 2 or more hours per day.

Active play refers to the proportion of children and youth who engage in unstructured or unorganized active play, indoors or outdoors, for 2 or more hours per day.<sup>13</sup>

A cross-sectional study conducted with 13-16 year old youth (n=395) from Karnataka, India found that girls spent an average of 21 minutes in active play daily compared with 54 minutes per day spent by boys.<sup>21</sup> In particular, there was a significant difference in active play outdoors, with girls engaging in an average of 16 minutes vs 49 minutes for boys.<sup>21</sup>

In another cross-sectional study conducted in Kharagpur, West Bengal, children and youth aged 9-13 years (n=40) were asked “do you like to play?” and “do you go to parks/playgrounds?” This study could not be graded as the response options were yes/no.<sup>22</sup> However, Raskind et al (2020) also found that males spent an average of 13 minutes playing outdoors on weekdays and 35 minutes on weekends, compared to females who spent 19 minutes playing outdoors on weekdays and 53 minutes on weekends.<sup>25</sup>

The grey literature search uncovered several organizations dedicated to promoting active play, including Kids India, Project Khel, and Khel Khel Mein Foundation.<sup>23-25</sup> Despite their important work, no publicly available data was available on their reach or impact.

Given the low sample size (n = 435) from the two peer-reviewed studies found, as well as insufficient grey literature, this indicator was graded incomplete.

**WHY IS ACTIVE PLAY IMPORTANT AMONG CHILDREN?**

Active play is an important contributor to overall physical activity, especially among young children. Many children who do not participate in organized sports or structured activities, particularly infants and preschool-aged children, may engage in active play as their primary form of activity.<sup>26,27</sup> Research also suggests that children accumulate up to 50% more MVPA during unstructured play than they do during organized physical activities.<sup>33-35</sup>

For many young children, active play may be the primary form of physical activity accumulation. Unlike structured activities, active play encourages creativity, independence and social behaviour. It also improves one’s ability for conflict resolution, problem solving, and motor skills— aspects that are important to children’s social, emotional, and cognitive development.<sup>26-29</sup>



The grade B- indicates that well over half of children and youth use active transportation to travel to different destinations.

## ACTIVE TRANSPORTATION

**GRADING CRITERIA:** The proportion of children and youth who walk or bike to different destinations (e.g. home, school, park).

Active transportation refers to the proportion of children and adolescents who walk or bike to different destinations (i.e. home, school, park, friend's house).<sup>13</sup> Evidence from peer-reviewed studies and unpublished primary data (n = 2696 across samples) was reviewed from urban and rural children and youth.

A cross-sectional study in Chennai, India conducted among youth aged 12-17 years (n=324) assessed use of active transportation (walking, cycling) to/from school.<sup>30</sup> The vast majority (73.5%) of adolescents did not walk to/from school, and 28.1% reported walking 5-6 days per week on average. The proportion of adolescents who cycled was similar, with 78.4% of adolescents reporting no cycling, and 20.4% cycling 5-6 days per week on average. Approximately 52% of adolescents used an active mode of travel to/from school at least 1 trip per week, with no gender differences reported.<sup>30</sup> Another cross-sectional study conducted across 9 high schools using randomized stratified sampling (n=1096) in Kanpur, Uttar Pradesh found a gender effect of travel mode choice.<sup>31</sup> On average, 35% of adolescents aged 5 to 17 years engaged in active transport, with 24.5% of males cycling and 15.4% walking to school (total 39.9% engaging in active transport). Approximately 18% of females reported walking to school, and 10% cycled to school (total 28% engaging in active transport). A cross-sectional study conducted in Punjab among adolescents aged 11-17 years (n=1050) from urban and rural government schools found that 90% of participants engaged in an active mode of travel.<sup>32</sup>

The grey literature search uncovered several reports focused on active transportation initiatives; however, these reports largely focused on the built environment and did not present evidence of implementation or impacts on children or adolescents.<sup>33,34</sup> Primary data collected in urban and rural Pune (n=226) found that

## WHY SHOULD WE FACILITATE ACTIVE TRANSPORTATION IN CHILDREN AND YOUTH?

Current evidence indicates that children and youth who use active transportation accumulate more physical activity and have better health outcomes in comparison with those who are passive during transportation (e.g. car/bus travel).<sup>35-37</sup> Moreover, the benefits of active transportation extend beyond physical health as it increases social interaction, reduces road congestion, saves money on gas and parking, and more importantly, can contribute towards reduction in greenhouse gas emissions.<sup>38</sup>



45.7% of males and 54.3% of females cycled to school, and 39.7% of males and 60.3% of females walked to school.

Greater weight was given to studies conducted in multiple jurisdictions as they were more representative of the picture of active transportation across India. On average, approximately 60% of children and adolescents reported walking or cycling to school on a regular basis, thus active transportation received a B- grade.

The grade D indicates that one-quarter of children are meeting screentime guidelines.

## SEDENTARY BEHAVIOUR

**GRADING CRITERIA:** The proportion of children and youth who meet the sedentary behaviour guidelines of 2 hours or less of recreational screen time per day.

Sedentary Behaviour refers to the proportion of children and adolescents who meet the guidelines of less than 2 hours of recreational screen time per day.<sup>13,39</sup> Many physical activity-focused studies uncovered in the literature measured sedentary time; however, these data could not be used because they were inconsistent with the Canadian Sedentary Behaviour Guidelines.<sup>39</sup> Evidence from several large urban centres in India (n=3203 across studies) were assessed to identify sedentary behaviour patterns in India.

A study conducted in urban and rural schools in Thanjavur, Tamil Nadu (n=200) among grade 8 and 9 students found that the average screen time was 6.59 +/- 1.24 hours among urban boys, 3.28 +/- 0.17 hours for rural boys, 4.28 +/- 0.49 hrs for urban girls, and 4.07 +/- 0.44 hrs among rural girls.<sup>40</sup> In all categories, students reported exceeding the daily recommendation of 2 hours of screen time daily. Another study conducted among youth aged 11-17 years (n=1050) from urban and rural government schools in the three major regions of Punjab found that average weekly screen time was 9.8 hours for urban students and 9.5 hours for rural students.<sup>32</sup> A study conducted with adolescents aged 10-15 years in Mumbai, Maharashtra (n=772) found that 85% reported screen time over 120 minutes daily.<sup>16</sup> Girls reported higher screen time (average 218 minutes per day compared to 165 minutes per day for boys).<sup>16</sup> In another cross-sectional observational study conducted among children aged 10-13 years (n=139) in Tamil Nadu, the average daily screen time was over 2 hours (52.5%), with 28.8% of the sample reporting less than 60 minutes of daily screen time.<sup>17</sup>

A review of primary data collected in Pune (n=1042) found that 25.6% of children and youth met the screen time guidelines of less than 2 hours daily.

### WHY SHOULD WE ENCOURAGE CHILDREN AND YOUTH TO BE LESS SEDENTARY?



Children can be highly active and highly sedentary on the same day! Irrespective of the amount of physical activity children accumulate, they could still spend a lot of time in sedentary pursuits such as watching television.<sup>41</sup> Taking this observation into consideration is important, because increasingly, evidence suggests that independent of physical activity levels, sedentary behaviours are associated with increased risk of both physiological and psychological problems.<sup>42</sup> Watching television for more than 2 hours per day has been associated with unhealthy body composition, decreased fitness, low self-esteem, and decreased academic achievement. Fortunately, evidence also suggests that decreasing any type of sedentary behaviour is associated with lower health risk in children and youth.<sup>42</sup> Moreover, with evidence now emerging that sedentary behaviour embedded in childhood can continue through adolescence into adulthood,<sup>43</sup> it is imperative to focus on curbing sedentary behaviour in children and youth.

There was a small difference between urban and rural participants; however, when comparing male vs. female screen time behaviour, 23.3% of males met screen time guidelines compared to 28% of females.

Overall, there was great variation in how studies depicted sedentary behaviour accumulation. When assessed in accordance with the screen time guidelines,<sup>39</sup> only one-quarter of Indian children and adolescents met guidelines, thus Sedentary Behaviour received a D grade.

## FAMILY AND PEERS

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**GRADING CRITERIA:** The proportion of parents or guardians who facilitate physical activity and sport opportunities for children, meet physical activity guidelines for adults, and are physically active with their children. The proportion of children and youth with peers who encourage and support them to be physically active.

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Family and peers play an important role in promoting physical activity among children and youth. They can provide physical resources, financial support, and emotional encouragement to be physically active, and can help create an environment conducive to active living.

A systematic review of the literature uncovered only

### WHY ARE FAMILY AND PEERS IMPORTANT FOR PHYSICAL ACTIVITY?

Research has shown that family, particularly parents, have a large influence on children's physical activity. Children of physically active parents are more likely to be physically active themselves.<sup>44-47</sup> Sibling and peer physical activity is also strongly connected to child and youth activity levels.<sup>46</sup>

two relevant studies since the 2018 India Report Card; however, the data presented were not in accordance with grading criteria for this indicator. Primary data collection in Pune (n=1042) asked children and youth aged 5-17 years, "how much do your parents/guardians encourage you to be physically active?" 82% of respondents answered that they strongly encouraged, and 17% reported that they encouraged them. Due to the lack of evidence, Family and Peers received an incomplete grade.



GRADE **C**

A grade of C indicates that while schools across India mandate physical education (PE) classes, there is limited access to infrastructure and facilities outside of PE classes which may restrict opportunities for physical activity accumulation.

## SCHOOL — INFRASTRUCTURE, POLICIES AND PROGRAMS

**GRADING CRITERIA:** The proportion of schools implementing active school policies, providing opportunities to be physically active at school, and enabling access to necessary facilities and equipment to support physical activity.

School is a complex indicator which captures infrastructure, as well as school policies and programs. This indicator was graded after reviewing evidence of the following: proportion of schools with active living policies, physical education (PE) classes taught by a PE specialist, offering the state or nationally mandated amount of PE, offering opportunities for physical activity, and providing regular access to facilities and equipment which support physical activity (i.e., playgrounds, gymnasiums, etc.).<sup>13</sup>

One study sent questionnaires to teachers from 19 schools to capture information about school policies in New Delhi, and also surveyed parents of children and youth aged 6-7 years (n=574) and 15-16 years (n=755) to understand school practices.<sup>48</sup> The study found that 80% of primary and 90% of secondary private schools had PE in the curriculum. The majority of primary (78%) and secondary (100%) government schools also had PE in the curriculum. This included 2 PE periods per week totalling 50 minutes in government schools and 40 minutes in private schools. Yoga was included in 70% of primary and 60% of secondary private schools, as well as 67% of primary and 78% of secondary government schools surveyed. Overall, Bassi et al (2019) found that PE was available at least once per week in almost 80% of schools, but there was no evidence of daily physical activity or daily access to physical activity opportunities at school.<sup>48</sup>

Another study conducted across 61 schools (17 government and 44 private) in Bengaluru found that playgrounds were available in 16% of private and 65% of government schools.<sup>49</sup> However, there was no evidence

### HOW DO SCHOOLS CONTRIBUTE TO PHYSICAL ACTIVITY?

Schools are a critical venue for the accumulation of physical activity as children and youth spend a substantial amount of their waking hours at school. Schools can provide equipment and space to be physically active, as well as necessary programming and education to instill the importance of physical activity for overall health and fitness.



of regular access for students to playgrounds. A national, cross-sectional survey across urban and rural areas in India which included 1402 households and 1531 adolescents,<sup>14</sup> found that approximately two-thirds of students reported having health education in school (including PE). A total of 64.3% of adolescents reported doing physical activity in their schools for an average of 16.1 minutes per day.<sup>14</sup>

Primary data collected in urban and rural Pune asked students aged 5 to 17 years about access to physical activity areas and equipment at school during and after school hours. Approximately 44% reported having access to activity areas between school hours, 63% reported having access to outdoor activity areas between classes, and 85% reported having access to physical activity equipment throughout the school day. Only 9% reported having access to the gym areas before/after school, while 24% reported access to indoor facilities before/after school. Approximately half of students (55%) reported having access to outdoor facilities before/after school, and 35% reported being allowed to use equipment before/after school.

Overall, there is evidence that schools across India mandate physical education classes, with some schools providing PE infrastructure and facilities access for students during the day. However, access to PE equipment and areas is limited outside of school hours indicating that current school policies may be restricting opportunities for physical activity accumulation. Thus, School received a C grade.

A grade of D indicates that overall community and built environment is not promoting active living among children and youth, with a significantly high proportion of communities lacking active living policies or infrastructure.

## COMMUNITY AND BUILT ENVIRONMENT

**GRADING CRITERIA:** The proportion of children or parents who perceive that their community/municipality is adequately promoting physical activity, and/or report living in a safe neighbourhood where they can be physically active. The proportion of communities/municipalities that report they have policies and infrastructure (e.g., sidewalks, trails, paths, bike lanes) geared toward promoting physical activity.

Community and the Built Environment refers to the proportion of children, adolescents, and/or parents/guardians who perceive their community as conducive to physical activity. This includes physical activity policies and infrastructure (e.g., sidewalks, trails, bike lanes), as well as parks, playgrounds, and overall safety and aesthetic of a neighborhood to facilitate active living.<sup>13</sup> A total of four peer-reviewed studies and one primary dataset were reviewed, which included 1542 respondents from Kharagpur, New Delhi, Lucknow, Chennai, and Pune, India.

A cross-sectional study conducted in Kharagpur surveyed children 9-13 years (n=40) regarding perceptions of neighbourhoods, mobility patterns, and daily physical activity.<sup>22</sup> Das et al (2021) found that most parks were located at least a 20-minute walk from participants' homes; however, low park accessibility, availability of benches, and safety were noted as big issues affecting children's mobility.<sup>22</sup> Another cross-sectional study conducted with parents of children aged 7-12 years (n=15 families) in New Delhi found that 82% of parents restricted children's independent mobility, with only 46% of parents reporting that they trusted neighbours to keep an eye on children in their absence.<sup>50</sup> The majority of parents (68%) felt that the built environment (i.e., footpaths of sufficient width, traffic) was conducive to children's physical activity. There were low perceptions of safety, in general, and parents reported that their children's gender (i.e., having a female child) limited independent mobility.<sup>50</sup>

A study conducted in Lucknow, Uttar Pradesh surveyed 47

### WHY SHOULD WE FOCUS ON THE BUILT ENVIRONMENT?

Evidence indicates that safety, access to recreational facilities and opportunities for active transportation increase physical activity levels in children and youth.<sup>53-58</sup> Recent evidence has revealed a more complex picture, where multilevel environmental determinants (urban design, neighbourhood built and social environment, school and home environment) have been shown to influence physical activity in children and youth.<sup>58-60</sup> In terms of urban design, it has been shown that more than one type of design can facilitate active living.<sup>61</sup>

professionals including architects, planners, psychologists and pediatricians using the Delphi method, as well as children and youth aged 6-14 years (n=59) to understand perceptions of child-friendliness of neighborhood built environments.<sup>51</sup> The study found that Lucknow did not meet quantitative norms and standards as laid out by the national standards for open spaces and parks. The overall "child-friendliness" was rated as 'weak'.<sup>51</sup> Similarly, a study conducted in Chennai among youth aged 12-17 years (n=324) found that 50% of youth said there were no pavements for walking, 28.7% reported open drains on their commuting path from school-home, 47.5% noted dangerous crossings, 47% reported that it was too far to walk or cycle to school, 55.6% reported too much traffic, and 45% reported the presence of stray dogs as dangerous for active transportation.<sup>30</sup>

Evidence from primary data collected in Pune found that 53% of children and youth (n = 1042) found air pollution to be a problem, with 35% of respondents reporting that pollution prevented them from outdoor physical activity. Air pollution was reported as a bigger problem in urban settings (64% vs. 39% in rural Pune). When asked about the built environment, 55% reported footpaths in their neighbourhood, 76% noted trees along the streets in their neighbourhood, 36% reported too much traffic, and 18% reported crime making it unsafe to go out at night. Lack of footpaths, zebra crossings, and crime were a lesser problem in rural vs. urban Pune.

Overall, recent evidence poorly rated urban infrastructure for walking and biking, access to physical activity spaces, safety from crime and traffic, pollution, and aesthetics, resulting in a D grade for Community and the Built Environment.





A grade of C+ indicates that there is evidence of investment to encourage physical activity among children and youth; however, the majority of strategies and investments are focused on competitive sport and the development of national and international athletes.

## GOVERNMENT STRATEGIES AND INVESTMENTS

GRADING CRITERIA: Demonstrated leadership, investments, and evidence of implementation of physical activity strategies targeting children and youth.

Government Strategies and Investments refers to the demonstrated leadership and investments in physical activity strategies targeting children and adolescents (i.e., policy agenda, formulation, implementation, evaluation and decisions about the future) in India.<sup>13</sup>

A systematic search uncovered several publications, including a report on the Khelo India initiative which was recently introduced to revive sports culture in India at the grassroots level.<sup>62</sup> An investment of 1756 crores is reported between 2018-2020 to build sports infrastructure in India. Another article summarizes the government's commitment to invest in physical education and sports, including compulsory PE classes in schools.<sup>63</sup> The grey literature uncovered dedicated investments by the Ministry of Youth Affairs and Sport (Government of India) to developing sports facilities and nurturing athletic talent across India,<sup>64</sup> including the Rajiv Gandhi Khel Abhiyan Grant. This grant aims to provide universal access to sports in rural areas and promote sports culture among both girls and boys, harnessing potential sporting talent among rural youth through competition structures. It is also focused on providing training and exposure to sports in India including promoting Indigenous games.

## WHAT IS THE ROLE OF GOVERNMENT POLICIES, STRATEGIES AND INVESTMENTS?

Government policies, strategies and investments play a critical role in setting a multi-jurisdictional (i.e., national, state, municipal) agenda that drives policies and programs at different levels of implementation. For example, generating awareness and education through schools, built environment and urban design, as well as family, peers, and educators. Government also has a role to play in resource allocation towards active living research to address the lack of evidence, and towards evidence-based active living interventions to facilitate physical activity and discourage sedentary behaviour.

A report on National Youth Policy in India<sup>65</sup> summarized investments made by national and state governments to improve sports infrastructure through programs like Khelo India and the National Playing Fields Association of India.

While there is evidence of investment to encourage schools to develop infrastructure, the area of concentration is the development of athletes. There was no evidence of a concerted national strategy or vision to address the physical inactivity epidemic through education of parents, teachers, or development of intersectoral policy interventions (i.e., urban/transportation planning), and the majority of government strategies in India were predominantly focused on competitive sport and the development of national and international athletes. Thus Government Strategies and Investments received a C+ grade.



**GRADE INC**

The grade of incomplete (INC) indicates that there was insufficient information available to assess this indicator.

**PHYSICAL FITNESS**

**GRADING CRITERIA:** The proportion of children and youth that exhibit good performance on given physical tasks in a specified physical, social and psychological environment. This includes, but is not limited to, cardiorespiratory endurance, muscular strength, muscular endurance, flexibility, and explosive strength.

Physical fitness refers to the proportion of children and adolescents performing well in exercise regimens or tests meant to test physical fitness, including: cardio respiratory endurance, muscular strength, muscular endurance, flexibility, explosive strength, and body composition.<sup>13</sup>

A review of the literature uncovered two peer-reviewed studies that met this criteria. One cross-sectional study assessed grip and pinch strength of children and youth aged 5-18 years (n=900) in Mumbai, India.<sup>66</sup> Shetty et al (2019) reported on differences in grip and pinch strength between age groups and genders, showing that strength increased with age and was higher among boys.<sup>66</sup> However, the means for grip and pinch strength values could not be graded. Another cross-sectional study in Chennai, India assessed the impact of a dance intervention to improve physical fitness among adolescent girls (n=23).<sup>67</sup> Mean body mass index, blood pressure, and heart rate were reported; however, data were also not conducive to grading.<sup>67</sup>

A review of the grey literature found a government initiative called Fit India which importantly shared guidelines for physical fitness assessment of different age groups; however, no data were presented. Thus given the low sample size, lack of representativeness, and limited measures of physical fitness, this indicator received an incomplete grade.

**WHY DOES PHYSICAL FITNESS MATTER?**

Physical fitness provides an indication of a child's physical capabilities. Routine tests allow educators and parents to monitor physical fitness over time. Overall, physical fitness serves as a proxy measure for health status (e.g. cardiovascular health).



The D-\* grade indicates that despite demonstrating a commitment to promoting yoga, uptake of yoga programming among children and youth is very low.

## YOGA

**GRADING CRITERIA:** The proportion of children and youth engaging in any form of yoga practice (i.e., hatha, ashtanga) on a daily basis.

Yoga refers to the proportion of children and adolescents practicing any form of yoga (e.g., hatha, ashtanga) at home or school. Given its cultural significance and history, yoga is a physical activity which public, private, and governmental organizations have emphasized in school and community programming across India.

Many studies on yoga practice among children and youth (within and outside of school settings), were excluded as they were either published prior to 2018, or data were not presented in a format that could be evaluated for the report card (i.e., proportion/frequency of yoga practice). Primary data were collected using cross-sectional surveys in 2021 among children and youth (n=1042) aged 5 to 17 years in rural (n=420) and urban (n=622) Pune. When asked about yoga practice, only 22.3% of the sample reported practicing yoga daily. The proportion was higher among urban (28.5%) vs rural (13.1%) participants, and also higher among females (24.1%) compared to males (20.5%).

The grey literature indicates several national and state-level organizations dedicated to promoting yoga practice in India, including Karuna-Shechen to promote yoga in remote villages, The Yoga Institute organizing International Yoga Day, Krishnamacharya Yoga Mandiram providing free yoga training to underprivileged communities,

## WHY SHOULD WE ENCOURAGE CHILDREN AND YOUTH TO DO YOGA?

The ancient practice of Yoga has been a part of life in India over the past 2500 years. The combination of physical, mental, and spiritual aspects of the practice make it imperative to include yoga as part of a key indicator of physical activity and fitness in India, especially due to its cultural implications. Moreover, with the physical practice of yoga becoming popular in the West, it is time to recognize this practice as a way to improve physical activity and fitness among children.<sup>85</sup> Current evidence indicates a positive relationship between yoga practice, cognitive abilities, and mental health among Indian children and youth.<sup>86-88</sup> More importantly, growing evidence from across the globe suggests that yoga within school curricula may be an effective avenue to help students develop self-regulation and physical fitness.<sup>89</sup>

and Sivananda Yoga Vedanta Dhanwantari Ashram hosting kids' camps to encourage youth-centered yoga practices.<sup>68-72</sup> Despite the diverse range of yoga-focused organizations, there was a lack of program evaluation which makes it difficult to ascertain the reach and effectiveness of many of these programs.

Based on primary data from urban and rural jurisdictions where approximately 20% of children and adolescents reported practicing yoga, as well as the reported commitment to yoga from national and state-level organizations across India, the Yoga indicator received a D-\* grade. The asterisk indicates that this grade was based on limited data.



## RECOMMENDATIONS

### RECOMMENDATION 1: Investing in active living research and policy

In order to improve physical activity among children and adolescents, investments towards active living research and policy are critical. Multiple sectors (e.g. health, education, transportation, and urban planning) need to work together in developing a funding agenda to drive active living research across various indicators noted in the Report Card, and to enable policy implementation.

### RECOMMENDATION 2: Developing a national physical activity strategy for children and adolescents

While there is some indication that school boards and private organizations are implementing physical activity programs, there is no national-level strategy to promote physical activity among children and adolescents. A national strategy would make physical activity a priority among schools, communities, cities and states, thereby providing relevant resources to support a culture of active living, and helping guide investments, policies, and programs across the country.

### RECOMMENDATION 3: Minimizing gender-based inequities in physical activity

Reiterating evidence from the 2018 India Report Card, current findings continue to show significant differences in physical activity opportunities and access between boys and girls. Cultural and social norms, as well as safety concerns, limit girls' participation in physical activity. To counter this inequity, both national and local policies and programs need to encourage equal participation from girls in exercise and sport through dedicated initiatives which address existing barriers.

### RECOMMENDATION 4: Prioritizing active transportation to improve activity levels while mitigating climate change impacts

At the local jurisdictional-level, significant steps could be taken to enable children and adolescents to walk and bike to schools. As a fast-growing nation, there is a surge of urban development in India, which provides an incredible opportunity to reimagine built environments. New developments can promote safe walking and biking, and minimize the reliance on fossil fuels – a necessary step to intersect active living policy with climate change adaptation. Such an approach will also curtail air pollution (a major barrier to active living), as Indian cities have some of the highest levels of air pollution in the world.

### RECOMMENDATION 5: Enabling equitable access to physical activity through schools

Schools should be the primary venue to promote equitable access to physical activity. For instance, although rural children accumulate more physical activity via active transportation, they may not have the same infrastructure access in comparison to urban centres. Children and youth spend a significant amount of time at school, thus providing equitable access and infrastructure to both urban and rural children and adolescents can have a positive impact on overall physical activity.

The recommendations for action are not mutually exclusive. If India is to make significant progress in active living among children and youth, the recommendations are to be implemented in concert, where there is interplay between multiple aspects of these action items.

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## WHAT IS AHKI?

A non-profit organization whose aim is to:

1. Connect researchers, educators, and decision-makers interested in children's active living.
2. Advocate for active living and related health outcomes for children and youth in India.
3. Partner with research and other groups worldwide to enable knowledge exchange to improve the health of children and youth in India.

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