

What's next?

I want to do that too!

It's my turn!

The 2016 **Japan** Report Card on

Physical Activity for Children and Youth



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Japan Society of Human Growth and Development

The 2016 Japan Report Card on Physical Activity for Children and Youth Details of Method and Results

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Objective of the 2016 Japan Report Card on Physical Activity for Children and Youth

Public health surveillance of physical fitness in children and youth in Japan using school-measures of physical fitness has been based on the Physical Fitness Test of the Ministry of Education, Culture, Sports, Science and Technology (MEXT) since 1964, when the 18th Summer Olympic Games were held in Tokyo. This annual surveillance is performed to evaluate physical fitness and exercise, life and eating habits across the life course, from Japanese children to the elderly. In 2013, MEXT issued a report comparing physical fitness in children and adolescents from the 1980s to the present. Results indicated that physical fitness and motor skill levels obtained in 2014 were lower than results in the 1980s (MEXT 2013). Also, obesity is increasing and physical activity is decreasing around the world (OECD 2014, Hallal et al. 2014). With the mission to improve physical activity in children and youth, The Active Healthy Kids Global Alliance was established in 2014. The Active Healthy Kids Global Alliance is a network of researchers, health professionals and stakeholders who are working together to advance physical activity in children and youth from around the world.

Western countries have been publishing the Report Card on Physical Activity for Children and Youth to consolidate existing evidence; identify research gaps; facilitate international comparisons; encourage more evidence-informed physical activity and health policies; improve surveillance of physical activity of children. However, there is a deficit of evidence from outside western countries, including Japan. The relationship between physical activity and environmental factors in Japan may be different from those in Western countries. For example, in Japanese children, moderate-to-vigorous physical activity (MVPA) was significantly related to the safety and the availability of greenery in neighborhoods (Tanaka C. et al. 2011). Moreover, thinness, rather than excess weight, is associated with decreased light, moderate, and high intensity physical activity (Tanaka C. & Tanaka S. 2013). The Report Card can clarify the physical activity environment in Japan and place it in an international context, which will be benefit to Japan and to other nations.

The 2016 Japan Report Card on Physical Activity for Children and Youth can provide critical and up-to-date evidence and information in order to support and advocate for physical activity and the health of Japanese children and adolescents. The Japan report card can be used in a number of ways: for example,

- a. Governments: could use the report to develop policy and to inform scientific and health investment strategies or decisions.
- b. Researchers/academics: could use the report to identify gaps in the evidence, to educate students, and use it to - inform research or knowledge exchange grant applications.
- c. Teachers, coaches, public health promoters, recreation professionals and community development leaders: could use it to inform work with children, adolescents, their families and community members.
- d. Provincial or municipal organizations: could use it as a tool to inform planning, research, grant writing and capacity building.

The Report Cards on Physical Activity for Children and Youth from Canada and 14 other countries published in 2014 presented a promising approach to achieving a more robust physical activity surveillance and evidence-based physical activity promotion strategies in Japan (Barnes J.D. et al. 2012, Colley R.C. et al. 2012, Reilly J.J. et al. 2014, Tremblay M.S. et al. 2014). In 2020 Japan will host the Tokyo Olympic and Paralympic Games. A joint UK Government and Mayor of London report showed that 1.4 million more people are playing sport once a week since London won the bid in 2005, as one of the legacies from the London 2012 Olympic and Paralympic Games (Government of the United Kingdom and Mayor of London, 2013). Similarly, the Japan report card can reveal the sporting legacy created by the Games, and may have a lasting impact on not only children and adolescents but also on the country and its residents, in the near future.







The Long Form Japan Report Card 2016 explains how the report grades were derived, which data sources were used to derive the grades, and which data sources were considered for the report card but were not used for grading and why. Links to all data sources are also provided. Results of studies of Japanese children and youth were summarized for some indicators, allowing the report to illustrate global gaps, and to detect problems particular to Japan.

Methodology

The Report Card on Physical Activity for Children and Youth is published in 15 countries on 5 continents using 9 common indicators (Overall Physical Activity Levels, Organized Sport Participation, Active Play, Active Transportation, Sedentary Behaviour, Family and Peer Influence, School, Community and the Built Environment, and Government Strategies and Investments). The report card is the most comprehensive assessment of child and youth physical activity.

This first Japan Report Card 2016 assigns grades to 11 indicators grouped into 2 categories (see below). Nationally representative Japanese data were used where possible, as this is a national report card.

The card grades are determined by the percentage of Japanese children and adolescents meeting the benchmark for each indicator.

-  We are succeeding with a large majority of children and adolescents (81-100%)
-  We are succeeding with well over half of children and adolescents (61-80%)
-  We are succeeding with about half of our children and adolescents (41-60%)
-  We are succeeding with less than half children and adolescents (21-40%)
-  We are succeeding with very few children and adolescents (0-20%)
-  Incomplete data combined with lack of an evidence-based recommendation.

The grades illustrate the state of physical activity in Japanese children and adolescents. The report card can be utilized as information to support policy development in physical activity for children and adolescents, families, schools, local communities and the country as a whole.

Summary of Report Card Indicators & Grades

Table 1. Grades According to Physical Activity Indicator in the 2016 Japan Report Card on Physical Activity for Children and Youth

Indicator	Grades
Physical Activity, Health Behaviours and Outcomes	
1. Overall Physical Activity Levels	INC
2. Organized Sport Participation	C
3. Active Play	INC
4. Active Transportation	B
5. Sedentary Behaviours	C
6. Physical Fitness	C
7. Weight Status	A
Settings and Influences on Physical Activity and Health	
8. Family and Peer Influence	D
9. School	B
10. Community and the Built Environment	D
11. Government Strategies and Investments	B

Physical Activity, Health Behaviours and Outcomes



1 Overall Physical Activity Levels



There are no representative Japanese data for physical activity in under 15-year-olds. The National Health and Nutrition Examination Survey reported step counts for 15-19 year olds. In males, the data showed a marked decrease for several years. On the other hand, the trend in females generally continues to be flat. However, data haven't been reported since 2012.

The results of the nationwide survey

The official national physical activity guidelines for each age group are as follows.

For 3-5 years olds: the official national physical activity guideline was proposed by MEXT. Youjiki Undou Shishin (2012)

The guideline reads "It's essential for preschool children to have various kinds of fun play more than 60min/day, everyday!". The guideline addresses only duration not intensity.

For 6-17 years olds: The Japan Sports Association guideline (Active Child 60min) for preschool and primary school children (2010)

The guideline reads "Let's move at least 60min/day, every day, move using your body in daily life, physical education and sports". Moreover, the guideline is not evidence based and uses primarily international not Japanese research. The guideline is based on international physical activity guidelines.

The indicator 'Overall Physical Activity' could not be graded, because evidence-based data for the behaviour were lacking in Japan. The National Health and Nutrition Examination Survey reported step counts for 15-19 year olds (Arunesu200S, AS-200). In males, the data showed a marked decrease over the past few years in 2010, with mean values of 7458 steps/day for girls and 7872 steps/day for boys (Cabinet Office, 2013). On the other hand, trend data in females generally continues to be flat, with no obvious recent secular trends. However, step count data haven't been reported by the National Health and Nutrition Examination Survey since 2012. An additional

problem is that in Japan an official national physical activity guideline does not exist for adolescents.

- The gathering of more nationally representative physical activity data for those under 18 years old is needed.
- Development of the Japan 2016 Report Card has also confirmed that there are currently no objectively or subjectively measured Japanese daily physical activity surveillance data for younger children, a major gap in public health surveillance in Japan.
- According to the MEXT (2010) survey, 10.5% of 5th grade boys and 24.2% of girls engaged in exercise for less than 60 min/week outside of physical education classes. In the second year of junior high school 9.3% of boys and 31.1% of girls engaged in exercise outside of school except for physical education class for less than 60 min/week. The great majority (90%) of children and adolescents who exercised for less than 60 min/week didn't belong to a sports club.

Main findings of previous studies in Japanese children and adolescents

- The Tokyo Metropolitan Board and Education Survey collected pedometer data for 6-17 year olds in Tokyo in 2011 and found that mean step counts were almost 11000steps/day in primary school students, almost 9000steps/day in junior high school students and almost 8000steps/day in high school students (The Tokyo Metropolitan Board and Education 2012). The step counts decrease with age and are lower in girls than in boys (Figure 1).
- There are consistent patterns among many previous studies in Japan that found daily step counts are higher on weekdays than on weekends, and are higher in

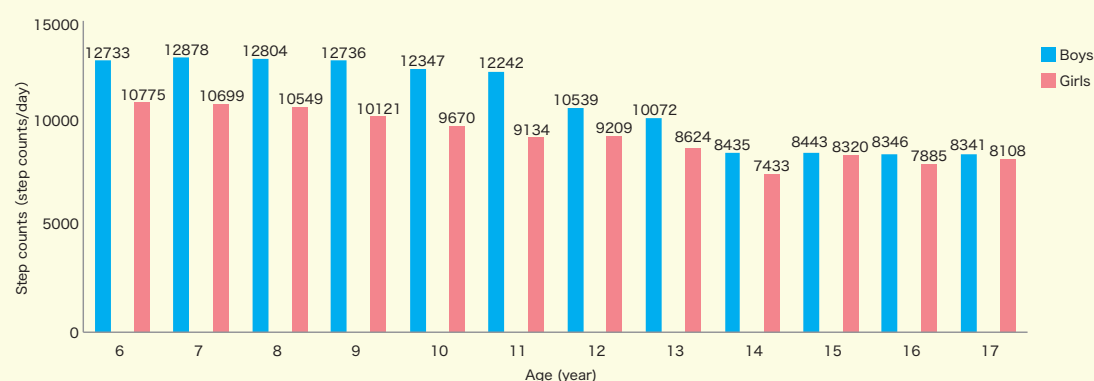
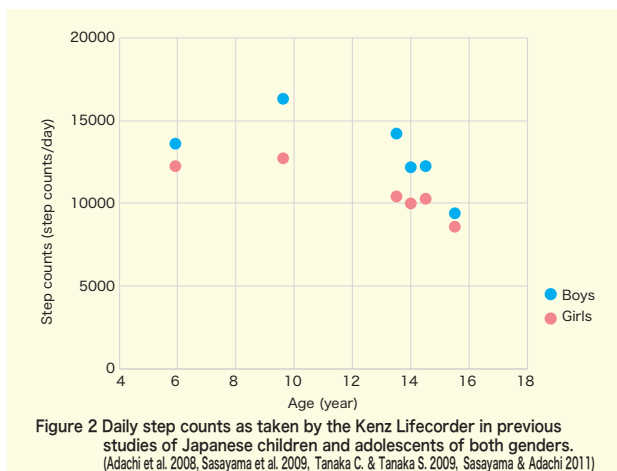


Figure 1 Mean values of daily step counts in boys and girls in the Tokyo metropolitan area.
(This graph was taken from a survey of step counts among children in the Tokyo Metropolitan area by the Tokyo Metropolitan Board of Education.)



women than in men (Adachi et al. 2007, 2008, Shiomi et al. 2008, Sasayama et al. 2009, Tanaka C. & Tanaka S. 2009ab, Mitsui et al. 2010, Sasayama & Adachi 2011, Tokyo Metropolitan Board Education 2011, Hanawa 2011, Nakae et al. 2013, Mishima et al. 2013, Ishii et al. 2015, Tanaka C. et al. 2015).

- Daily step counts under free-living conditions differed among pedometers depending on which type of pedometer was used. The average differences can be at least 20% (Tanaka S. et al. 2012). Figure 2 shows daily step counts which were measured by the Kenz Lifecorder (Suzuken Corp., Nagoya, Japan) in previous studies of Japanese children and adolescents (Adachi et al. 2008, Sasayama et al. 2009, Tanaka C. & Tanaka S. 2009, Sasayama & Adachi 2011). According to Tudor-Locke et al. (2008) categories, the results for primary school children are categorized as Gold or Silver.



- Among sixty adolescents aged 12-15 years, the physical activity level (PAL) using the doubly labelled water method were 1.97 ± 0.31 in subjects who exercised, and 1.85 ± 0.27 in subjects who did not exercise (Ishikawa-Takata et al. 2013).
- PAL by the doubly labelled water method was 1.64 ± 0.17 in girls ($n=10$, 10.9 ± 0.3 years old) and 1.60 ± 0.19 in boys ($n=20$, 10.6 ± 0.5 years old) in Chiba prefecture, respectively (Nakae et al. 2013).
- The changes in physical activity levels were evaluated with the Activity Style Pro (HJA-350IT, Omron Healthcare, Kyoto, Japan) among children and adolescents living in the area affected by the 2011 earthquake and tsunami for 3 years immediately following the disaster. Median daily step counts for children and adolescents were significantly different on both weekdays and weekends over the 3 years. The median daily step counts taken by children of both genders on weekdays and those of girls on weekends at period IV ($n=365$, 3 years after the earthquake/tsunami) were significantly lower than those at period I ($n=434$, 6 months after the earthquake/tsunami). In addition, the median daily step counts of adolescents on weekdays among girls and weekends among boys at period IV were significantly lower than those at period I (Okazaki et al. 2015).
- Among 195 Japanese preschool boys and girls aged 5.7 ± 0.6 years in Kanto region, the children's cognitive appraisals of themselves as being good at exercise or as liking exercise were not related with MVPA on weekdays or weekends (Ono H. et al. in press).
- The number of steps per day were significantly lower in rural areas (Tohoku region: in boys 12128 ± 2306 step/

counts and in girls 9343 ± 2020 step/counts) than in urban areas (Kyoto city: in boys 19775 ± 5277 step/counts and in girls 12128 ± 2306 step/counts) children ($n = 227$, 11-12 years old) (Itoi et al. 2012).

- From 1999 ($n=125$) to 2009 ($n=108$), step counts on weekdays in girls decreased considerably (20832 vs. 12237 steps per day in boys; ns and 16087 vs. 10748 steps per day in girls) (Itoi et al. 2015).
- Among 379 Japanese primary school boys and girls aged 9.3 ± 1.6 years in Tokyo, Kanagawa and Kyoto, the age at which children started walking without assistance was inversely correlated with the time spent in MVPA ($r = -0.24$). A younger age at which children started walking unassisted was significantly associated with increased time spent in MVPA. There was no evidence of an association between birth weight and MVPA (Aoyama et al. in press).
- Among 216 4th grade (9-10 years) elementary school children (105 boys and 111 girls), body fat in boys as measured by the bioelectrical impedance method was significantly correlated with sleeping, exercise, television watching periods, and step counts. For girls, BMI, relative body weight and body fat were significantly correlated with sleeping and exercise periods, as well as the steps counts but not with the amount of time spent watching television (Munakata et al. 2010).
- Among 300 Japanese adolescents aged 12-14 years in Tokyo, for boys, accumulating more than 80.7 min/day of MVPA as evaluated by the Lifecorder (Suzuken Co.) may reduce the probability of low fitness. For girls, accumulating only 8.4 min/day of vigorous physical activity could reduce the likelihood of exhibiting low fitness (Kidokoro et al. 2016a).
- The factors associated with achieving physical activity guidelines in 293 Japanese adolescents (140 boys: 13.2 ± 0.6 years old and 153 girls: 13.2 ± 0.6 years old) in Tokyo were investigated. Based on MVPA using the Kenz Lifecorder EX, the participants were classified as "Active" (≥ 60 min/day of MVPA) or "Inactive" (< 60 min/day of MVPA). After-school sports activities were positively associated with the probability of being Active for both sexes. In addition, body fat in girls was negatively associated with a reduced likelihood of being Active. Those in the Inactive group had significantly lower physical activity levels than those in the Active group on both the activities in regular curriculum time and in extra curriculum time. In addition, for girls, there was a significant interaction effect between domains activities in curriculum time vs. in extra curriculum time and after-school sport activities, suggesting that obtaining higher physical activity levels on extra-curricular activities might be difficult for those who do not belong to any after-school sport classes. Anthropometry, age, screen time, mental health, sleep status, and breakfast status were not associated with achieving physical activity guidelines (Kidokoro et al. 2016b).
- Among 98 Japanese elementary school boys (at baseline: 8.9 ± 1.8 years) and 111 elementary school girls (at baseline: 9.1 ± 1.8 years), daily MVPA was significantly higher during the summer vacation than during the school year for both boys and girls. Moreover, the decrease in non-ambulatory MVPA in boys was significantly lower in those who participated in sports compared to those who did not (Tanaka C. et al. 2016).



How to improve the grade of the Japan report card

1) How to improve the monitoring system of the Japan report card

- International and national physical activity guidelines for children over 5 years old to adults are 60 min per day or more of MVPA. However, as above, the official national physical activity guideline (Youjiki Undou Shishin, 2012) for 3-5 year olds in Japan was proposed by MEXT. The guideline reads "It's essential for preschool children to have various kinds of fun play for more than 60min/day, everyday!. The guideline addresses only duration not intensity. Moreover, the guideline is only based on research by MEXT (2007-2009) which found that preschool children who spent a longer time playing outdoors than their peers, as reported by their parents, had higher levels of physical fitness. The survey also found that over 40% of children played outside for less than 1 hour/day (MEXT, 2011).
- On the other hand, the Japan Sports Association guideline (Active Child 60min) for preschool and primary school children(2010) is not evidence based and uses primarily international, not Japanese research. The guideline is based on international physical activity guidelines (Start active, stay active, Canadian Society for Exercise Physiology, Australian Governments). An official national physical activity guideline for children and adolescents between 6 and 17 years old based on Japanese research similar to the one for primary school children is necessary.
- A regular monitoring system is needed to evaluate the present state of daily physical activity including regional and seasonal differences.
- In some countries methods to objectively measure daily physical activity (e.g. accelerometers) are used in public health surveillance. The evaluation of qualitative data for daily physical activity with questionnaires and

quantitative data with pedometers or accelerometers is needed in Japan. Moreover, an examination of the validity of the questionnaires is needed. The official national physical activity guideline (Youjiki Undou Shishin, 2012) in 3-5 years old in Japan suggests questionnaires and pedometers as the method of evaluation of physical activity in preschool children. A strong and significant correlation was observed between minutes of MVPA and step counts ($r=0.832$)(Tanaka C.& Tanaka S., 2009a), although the correlation coefficient between minutes of higher intensity activities and step counts was slightly lower ($r=0.604$).

- A future survey of daily physical activity that collects data on both the amount of time per a day spent in physical activity and intensity is needed.

2) How to improve the daily physical activity level in children and adolescents

- A strategy to improve physical activity on weekends, summer vacation and in girls is especially important.
- It is important that the public realizes that improvements in daily physical activity in children and adolescents can have a positive influence on many aspects of children's lives such as appropriate body weight management, improved physical fitness like aerobic power, better outlook on life, greater academic achievements, and so on.
- As noted below, increased participation in exercise and sports, increased time spent in active play, greater use of public transportation and active transportation, a decrease in sedentary behaviour, an improvement in the family environment in which children are raised, and the establishment of a system of sports facilities, such as sidewalks and bicycle tracks are all needed.

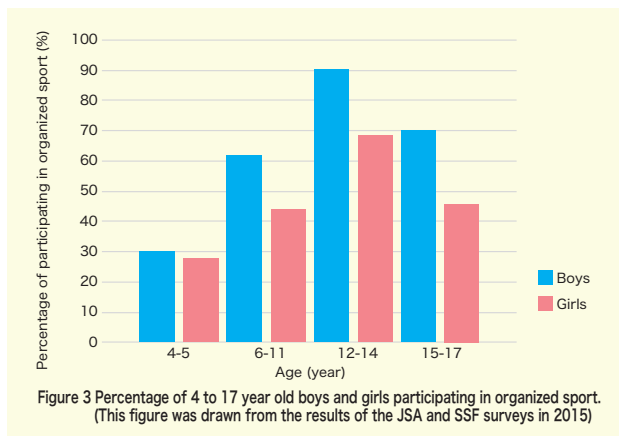
2 Organized Sport Participation



Participation in sport was reported for 27-92% of 6- to 17-year-olds by the Report of Survey on Physical Strength and Athletic Performance of Japan Sports Agency (JSA) (2015). The prevalence at 4-5 years old was reported at 29% in 2015 according to the Sasakawa sports foundation (SSF) National Sports-Life Survey of Children.

The results of the nationwide survey

- A national physical fitness survey has been conducted by MEXT every year since 1964 to evaluate the physical fitness and motor skills of Japanese citizens. The survey data is used administratively and as supporting data for evaluating and creating teaching methods for physical education and sports. For children and adolescents, the participants in the survey were public primary, junior high school and high school students (6-18 year old) of both genders in 47 prefectures. The survey is conducted from May to July and samples 1000 children or adolescents every age group. An exhaustive survey has been conducted in grade 5 in primary school (10-year-olds) and the second year in junior high school (13-year-olds) from 2007. This is a national representative survey.
- In 2001, the SSF has carried out a national survey every 4 years to understand the current status of participation in sports among teenagers. The survey has been continuously conducted every two years since 2011. The SSF has also carried out a national survey of 4-9 years olds every two years since 2009. Both surveys are carried out using the household drop-off method with a questionnaire. The participants were randomly selected boys and girls aged from four to nine and ten to nineteen throughout the country using a two-stage stratified random sampling for every 200 children or adolescents in all age groups. The usefulness of the survey of preschool children is limited by its small sample size.



Main findings of previous studies in Japanese children and adolescents

- Obviously, the physical fitness of children and adolescents who belonged to sports clubs was higher than that of children and adolescents who did not belong to sports clubs (MEXT, 2008).
- Grip strength, 25 m run speed and total Z-score were associated with sports club participation out of school in 191 Japanese 5-6 year preschoolers in the Kanto region (Tanaka C. et al. 2014).
- There were no significant differences of time in MVPA between children with and without out of school sports club participation in 211 Japanese 5-6 year preschoolers in the Kanto region (Tanaka C. et al. 2015).
- Academic achievement was associated with participation in extracurricular sports in boys (n=330) or participation of extracurricular sports and cultural affairs in girls (n=297) for 14 year Japanese junior high school students in Okayama prefecture (Sasayama et al. 2014). There were weak correlations between time spent engaging in exercise and academic achievement (boys: $r=0.182$, girls: $r=0.125$).
- The dose-response relationship between sports activity and musculoskeletal pain among adolescents (n=2403) aged 12 to 18 years in Shimane prefecture was examined. The prevalence of overall pain, defined as having pain recently at least several times a week in at least one part of the body, was 27.4%. The risk ratio for developing pain at 1-year follow-up per 1 h/wk increase in baseline sports activity was 1.03 (n=374) (Kamada et al. 2016).

How to improve the grade of the Japan report card

1) How to improve the monitoring system of the Japan

report card

- The Japanese government does not currently issue recommendations for organized sport participation in children and adolescents.
- In future Japan Report Cards, grades will be evaluated using the JSA survey.
- In future Japan Report Cards, grades for children and adolescents from between the ages of 6 and 17 will be evaluated using the JSA survey.
- A regular monitoring system that includes regional and seasonal differences is needed to evaluate the present state of participation in organized sports for children under the age of 5.

2) How to improve participation in organized sports by children and adolescents

- According to the above surveys and previous studies, the percentage of organized sports participation in boys' and girls' preschool children (SSF, 2015) was low. On the other hand, there is a bipolarization of organized sports participation in students (JSA, 2015). Thus, a strategy to increase the percentage of children who participate in organized sports is especially important. Moreover, the percentages of participation by girls were lower than in boys in all age groups. Thus, to provide an environment that allows girls to participate in organized sports the introduction of seasonal systems and/or multisport systems is needed. Examples of these include various types of exercise and sports clubs, the improvement of facilities (e.g. fostering comprehensive sport clubs, sports groups, NPOs: Nonprofit Organizations) and the maintaining and promoting of children's and adolescents' health facilities, a system that allows girls to participate in sports with friends and in their local communities, and facilities that let girls improve their competitive ability.
- In preschool children there was no significant difference in daily physical activity between those children who participated in a sports club outside of preschool and those who didn't. On the other hand, physical fitness and fundamental movement skills correlated with participation in organized sports, regardless of age group. Moreover, in junior high school children, a similar relationship between participation in sports clubs and higher academic achievement was found. Thus, it is particularly important to provide an environment that allows children and adolescents who wish to do so, to participate in organized sports. However, the more adolescents played sports, the more likely they were to have and to develop sports related pain and injuries. Thus, the duration and intensity of the sports activity has to be closely monitored by teachers, coaches, parents, and so on.



3 Active Play



There are no representative Japanese data for active and outdoor play. There are no Japanese government recommendations for active and outdoor play.

The results of the nationwide survey

- There are no Japanese government recommendations for active and outdoor play.
- According to the survey by the SSF, types of active play

in children (4-9yr) was 4.7 ± 3.7 types a year for boys and 5.5 ± 3.9 types a year for girls, respectively. The number of different types of active play increased until 7 years old for boys, 8 years old for girls (SSF, 2015).

Main findings of previous studies in Japanese children and adolescents

- The prospective longitudinal Toyama Birth Cohort Study (Takahashi et al. 1999) found that among obese children the percentage of one hour or less outdoor play time per day ($n=288$, 67.4%) was significantly higher than that in normal weight children ($n=508$, 59.5%) in 3 and 6 year olds. However, after modifying the participants' characteristics (e.g. body weight), the percentage of one hour or less outdoor playtime per day wasn't significantly different among both groups (Kagamimori et al. 1999).
- Medical examinations in Okayama Prefecture found that 73.8% of 1.6 year olds played outdoors almost every day and 55.8% of 3 year olds played outdoors every day. (Kano et al. 2009).
- Outdoor playing time and the percentage of outdoor playing time for more than 60 min/day in preschool children in the Kanto region were 81 ± 62 min/day and 64% for boys and 78 ± 61 min/day and 62% for girls, respectively. Data for outdoor playing time using questionnaires for parents were not significantly correlated with MVPA using triaxial accelerometers (Tanaka C. et al. 2015).
- There is an association between persistent expression of liking outdoor physical activity and self-reported health among both 6 and 12 year old children ($n=5238$) from the prospective, longitudinal Toyama Birth Cohort Study (Liu et al. 2015).
- Outdoor playing times were not significantly difference in urban areas (Kyoto city: in boys 46 ± 39 min/day ($n=77$) and in girls 35 ± 29 min/day ($n=79$)) and in rural areas (Tohoku region: in boys 32 ± 27 min/day ($n=45$) and in girls 34 ± 27 min/day ($n=26$)) children (11-12 years old) (Itoi et al. 2012).
- From 1999 ($n=125$) to 2009 ($n=108$), time spent playing outdoors in girls was significantly less (46 vs. 31 min per day in boys; ns and 31 vs. 12 min per day in girls) (Itoi et al. 2015).

- Playing with large blocks indoors and ball toss both indoors and outdoors are considered as MVPA in preschool children. Indoor play is not always light intensity (Tanaka C. et al. 2007, Kawahara et al. 2012). Moreover, in primary school children, ball toss both indoors and outdoors is also a MVPA (Hikihara et al. 2014).

How to improve the grade of the Japan report card

1) How to improve the monitoring system of the Japan report card

- Recommendations for active play in children and adolescents need to be established by the Japanese government.
- A regular monitoring system is needed to evaluate the present state of active play including regional and seasonal differences.

2) How to improve active play time in children and adolescents

- According to the above surveys and previous studies, further study/research is needed, because the number of studies of active play are few, although there are some previous studies which used questionnaires for preschools and primary schools.
- Preschool and primary school children spend MVPA in indoor play activities. Therefore, it is necessary to focus on both outdoor and indoor play.
- An increase in active play environments that allow for safe active play with diversified physical contents (e.g. Comprehensive sport clubs, NPOs), greater communication with friends and the local community about activities, as noted below, and the establishment of a safe environment for active play for children and adolescents, are all needed.
- Further study is needed on the types of play, the quality and quantity of indoor and outdoor play, the clarification of the state of active play, and effect of play on the health of children and adolescents.



4 Active Transportation



The 2015 SSF National Sports-Life Survey of Children reported that 28% of Japanese preschool school children (4-5 years old) regularly commuted actively (walking) to school. The 2015 SSF National Sports-Life Survey of Young People reported that 93% of Japanese elementary school children (6-11 years old) regularly commuted actively (walking or cycling) to school, and 88% of junior high school students (12-14 years old) and 68% of high school students (15-17 years old) regularly commuted actively.

The results of the nationwide survey

- The SSF database was used to estimate the prevalence of active transportation to school for the purposes of grading in this report card, as it provided recent and nationally representative data. The details are shown in the section on organized sport participation as above.
- According to a survey by MEXT (2008), 95% of elementary school children (10 years old) and 69% of junior high school students (13 years old) regularly commuted to school on foot. Time spent waking to school was 17.3 minutes for children (10 years old) and 17.6 minutes for adolescents (12 years old) on average.

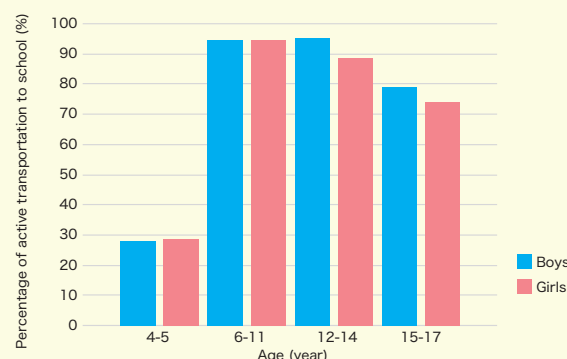


Figure 4 Percentage of active transportation to school.
(This figure was drawn from the results of the SSF survey in 2015.)

Main findings of previous studies in Japanese children and adolescents

- According to a survey of the state of health in children and adolescents in 2010 (Japanese Society of School Health, 2010) (n=10163), the average time Japanese students commuted actively (walking or cycling) to school was 18 min 35 sec in boys and was 19 min 33 sec in girls, respectively. There was no difference between primary and junior high school students (16-20min). Commuting time among high school age children was higher (23min). There was no difference between genders in every age group.
- In the Kanto region 5-6 year old preschool children (n=361) commuted almost 10min each way by walking to school (Tanaka C. et al. 2014).
- In rural areas almost 80% of 4th to 6th grade preschool children commuted to school by private motor vehicles. Time spent walking to school was 5min each way (Itoi et al. 2007).
- Time spent walking to school was significantly lower in rural areas (Tohoku region: in boys 4±7min/day (n=79) (percentage of walking to school: 31.1 %) and in girls 2±6min/day (n=26)) (23.1 %) than in urban areas (Kyoto city: in boys 37±23min/day (n=77) (100 %) and in girls 42±25min/day (n=79) (98.4 %) children (n = 227, 11-12 years old) (Itoi et al. 2012).
- From 1999 to 2009, time spent walking to school was significantly less (41 (n=62) vs. 35 (n=56) min/day in

boys; and 46 (n=63) vs. 39 (n=52) min/day in girls) (Itoi et al. 2015).

How to improve the grade of the Japan report card

1) How to improve the monitoring system of the Japan report card

- There are no Japanese government recommendations for active transportation.
- A national survey of preschool was conducted by the SSF (2015), however the usefulness of the survey is limited by its small sample size. Extensive investigation is needed.
- A regular monitoring system of national repetitive data is needed to evaluate the present state of active transportation by children and adolescents to school including regional and seasonal differences.

2) How to improve active transportation in children and adolescents

- It is important that the public realizes that active transportation to school in children and adolescents can have a positive influence on many aspects of children's lives such as high physical activity levels before class, appropriate body weight management, and so on.
- As noted below, the establishment of an environment conducive to physical activity, such as sidewalks and bicycle tracks, neighborhood safety, etc. are all needed.
- A future survey of active transportation and its effect on the health of children and adolescents is needed.

5 Sedentary Behaviours



The Report of National Survey on Physical Fitness, Athletic Performance and Exercise Habits of the JSA (2015) reported that 71-76% of grade 5 Japanese primary school children and second year in junior high school children spent more than 1 hour per day of watching TV, videos or DVDs viewing (Not playing video games). In addition, 30-60% reported 1 hour per day playing video games (PCs, portable electronic devices having a game function, cellular or smart phones). The 2015 SSF National Sports-Life Survey of

Young People reported that 31% of Japanese preschool children (4-5 years old) spent more than 2 hour per day of screen time (watching TV, PCs etc.).

The results of the nationwide survey

- The Japanese government does not currently issue recommendations for sedentary behaviour in children and adolescents. In other countries, sedentary behaviour guidelines are devised separately from physical activity guidelines. These state that school-age children and adolescents should spend no more than 2 hours per day in recreational screen time. There are no Japanese government recommendations for sedentary behaviour.

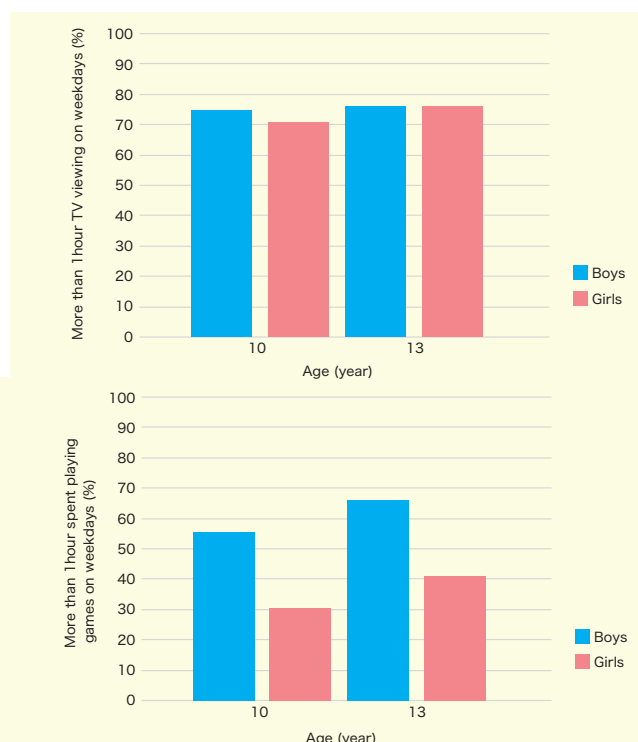
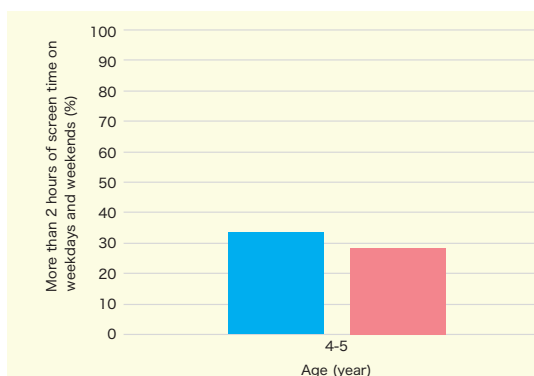


Figure 5 Status of sedentary behavior.

(These figures were drawn from the results of the JSA and SSF surveys in 2015.)

- The JSA survey reported that 5th grade primary school and 2nd grade junior high school students who watched TV or used games/cell phones/smart phones for more than 3 hours a day was lower than the others (JSA, 2015).

Main findings of previous studies in Japanese children and adolescents

- In a cross-sectional survey with 9261 school children (mean age of 12.8 years) from 93 junior high schools in Toyama prefecture, percentages of TV viewing time in boys and girls were <1h: 14.1% and 13.9%, 1-2h: 39.8% and 35.2%, 2-3h: 27.8% and 26.5%, 3-4h: 10.7% and 13.3%, and >4h: 7.6% and 11.0%, respectively. Computer and TV-video game time were 0h: 20.0% and 56.1%, <1h: 41.1% and 28.3%, 1-2h: 27.8% and 10.5%, 2-3h: 7.2% and 3.1%, and >3h: 3.9% and 2.1%, respectively. With respect to TV viewing time, a gradual increase in TV time was also associated with an increase in risk of sleepiness in boys. A TV viewing time of 3 hours or more significantly affected the child's sleepiness. The maximum risk (OR=1.73) was found for a TV viewing time of more than 4 hours. In girls, a TV viewing time starting from 1 hour significantly affected the child's sleepiness; interestingly, 4 hours or more spent on such activities presented a higher risk (OR=2.30) in comparison to boys. In girls, playing computer and TV video games had no impact on sleepiness. However, in boys, more than 1 hour of computer and TV video games significantly affected the child's sleepiness. Thus, more than 1 hour spent on such activities significantly increases the risk for sleepiness (OR=1.41) (Gaina et al. 2007).
- Preschool children (3 to 5 year old: n=569) in Okayama prefecture who had long TV viewing times went to bed later, had shorter sleeping times, an irregular rhythm of going to bed or waking up in the morning, and were in the habit of watching television while they eat (Hattori et al. 2004).
- There were no significant differences in TV and video viewing times between age, gender, the presence of brothers or sisters, a nuclear family or extended family, being a kindergarten or nursery school student in 868 Japanese 3-5 year preschoolers in Shimane prefecture (Kuritani & Yoshida 2008). Children who went to bed before 21:00 and got up before 7:00 had a significantly shorter TV and video viewing time. Time spent playing games grew significantly longer in older children, boys, those having brothers or sisters, and those who attended kindergarten.
- According to a survey by questionnaire in a medical examination for 1.6 year old (n=695) and 3.5 year old (n=995 children) in 2001 in Okayama prefecture, children's TV watching time was significantly shortened by parental regulations such as deciding the length of time children were allowed to watch TV, fixing times for children to watch television and videos, limiting watching time during meals, and encouraging children to engage in other activities such as playing outdoors or going to day care facilities (Kano et al. 2009).
- 30% of Japanese preschool children (n=599, 3.79 years old) in Kouchi prefecture had their own video game devices. Children who played video games every day had went to bed later and woke up later and were more active in the evening than those who did not play video games every day. Children who played video games between 18:00-21:00 went to bed later and woke up later and were also more active in the evenings than those who did not (Krejci et al. 2011).
- Primary school children (5 grade to 6 grade: n=445) in Okayama prefecture who played TV games for longer hours and watched TV/videos for longer hours went to bed at later than their peers who did not. (Hattori et al. 2008).
- Among 30 Japanese adolescents (11.7±0.4 year old) in Osaka prefecture, sedentary behaviour (TV or Video viewing, playing video games or card games, reading) had a significantly positive relationship with a higher percentage of body fat. Subjectively sedentary behaviour (246.6±629.1 min/day) in obese boys (170.8±611.4 min/day) was significantly higher than in normal weight boys (Mikami et al. 2003).
- The relationship between video game use including the tendency toward video game dependence and/or violent game use, and mental health regarding social relations, communication abilities, normative consciousness, aggressiveness, and other psycho-social problems of students was examined in primary schools (4th to 6th grade) students to high school students (n=2858) in Saitama prefecture. Both in primary school students and in junior high and high school students, the tendency toward video game dependence was significantly related to mental health, relationships to parents, communication, abilities, intentions towards family and school, normative consciousness, and aggressiveness. Violent game use was also related to aggressiveness. On the other hand, video game use time was not related to any dependent variables. These results suggest that the tendency toward video game dependence was related to problems in mental health and psycho-social development of children and adolescents who use video games (Tobe et al. 2010).
- Among primary school children (First to 4th grade) and junior high school students (n=2688) in Tokushima prefecture, time spent in TV watching among those children who ate meals with their family every day was shorter than that in children who ate their meals alone (first grade girl's students: 2.1±1.60 h/day vs 2.7±2.07 h/day, and adjusted grade: 1.8±0.79 h/day vs 2.2±0.6 h/day). There was no difference among primary school children (Yuasa et al. 2008).
- Among 98 Japanese elementary school boys (at baseline: 8.9 ± 1.8 years) and 111 elementary school girls (at baseline: 9.1 ± 1.8 years), daily sedentary behaviour was significantly higher in the summer vacation than in the school year for both boys and girls. Moreover, the increase in sedentary behaviour in girls were significantly lower in those who participated in sports compared to those who did not. The change in sedentary behaviour for boys was significantly associated with having a TV in the bedroom (Tanaka C. et al. 2016).
- In the Tohoku region struck by the 2011 Great East Japan Earthquake, the association of screen viewing time and study time with physical fitness among second-year high school students was examined in 322 boys and 356 girls enrolled from 2011 to 2013. Longer screen viewing time was associated with poorer endurance running speed in both boys and girls. Longer screen viewing time was also associated with lower standing broad jump distance in boys and grip strength in girls. In boys, longer study time was also associated with lower grip strength after adjustment for potential confounders. On the other hand, there was no relationship in girls was found (Chujo et al. 2015).

- Among 4th-6th grade primary school children (n= 265) in the public and private school, screen time was associated with higher psychological stress reactions and more days of absence from school, absenteeism independent of the above-mentioned adjusting factors (Nagano et al. 2015).

How to improve the grade of the Japan report card

1) How to improve the monitoring system of the Japan report card

- An official national sedentary behaviour guideline for children and adolescents between 6 and 17 years old based on Japanese research is necessary.
- A regular monitoring system is needed to evaluate the present state of daily sedentary behaviour including regional and seasonal differences.
- Objectively measured daily time in sedentary behaviour and breaks of sitting position (e.g. accelerometers, posture) should be used in public health surveillance (Tanaka C. et al. 2014).

2) How to improve sedentary behaviour in children and adolescents

- According to the above surveys and previous studies, in primary school children, long TV viewing time by parents has an effect on developing long TV viewing times in children.
- In adolescents, screen time has an affect on their mental health.
- Further study is needed, especially objective methods, because the number of studies of sedentary behaviour are few and there is a dearth of evidence of objectively measured sitting time, although there are some previous studies which used questionnaires.
- It is important that the public realizes that decreasing sedentary time in children and adolescents can have a positive influence on many aspects of children's lives such as appropriate body weight management, high physical fitness like aerobic fitness, better mental health and better academic achievement, and so on (Tremblay et al. 2011).

6 Physical Fitness



The Report of Survey on Physical Strength and Athletic Performance of the JSA (2015) comprehensively evaluated physical fitness by 5 gender- and age-specific ranks (A-E). The percentage of A and B rank among Japanese 6- to 17-year-olds was 42-67%. The physical fitness test data suggest that currently physical fitness level in children and adolescents are lower than that in the 1980s.

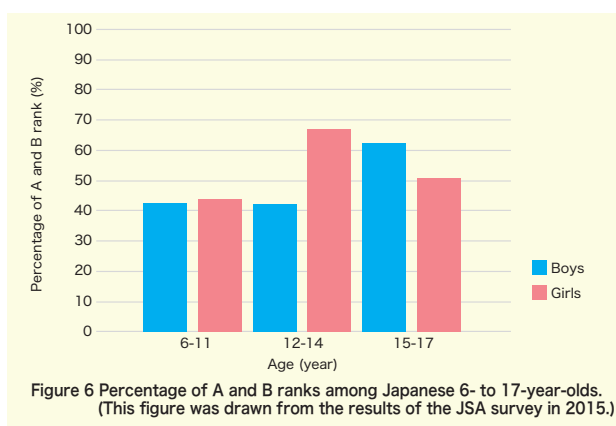


The results of the nationwide survey

- The Report of the Survey on Physical Strength and Athletic Performance of the JSA (2015) comprehensively evaluated physical fitness by 5 gender- and age-specific ranks (A-E). The ranks were based on the MEXT survey on physical strength and athletic performance. Thus, the evaluation value is not robust, although it is useful in comparing past results.
- According to the MEXT physical fitness survey (2014), conducted since 1964, the physical fitness level of Japanese children and adolescents reached a peak during the 1980s and then declined until around 2000. In the last ten years, physical fitness has flattened out, and shown a gradual upwards tendency.
- According to the MEXT survey (2014), students who participated in sports at school or in school sports clubs, had greater physical fitness and longer total exercise time per week than students who did not play or participate in sports. Moreover, these students said they liked sports and exercise and had better exercise skills including in active play.
- The MEXT survey (2014) examined the relationship between the percentage of 5th grade girls ranked A+B on comprehensively evaluated current physical fitness tests and the types of active play the children engaged in when they were in preschool. The percentage of these children who answered that they participated in "different type of activities" during preschool play was 42.8%. This was higher by 7.7% than those who answered "always the same activities", and was 23.1% higher than those who reported that they did not engage in any active play. The results are the same for boys.
- According to the MEXT survey (2012) 80.5% of boys and 64.5% of girls in primary school and 88.7% of boys and 69.4% of girls in junior high school exercised on

Saturdays and Sundays. The physical fitness of students who exercised on Saturdays and Sundays was higher those didn't exercise during weekends.

- The MEXT survey (2010) also found that primary school children who participated in sport events in their local community had higher total physical fitness scores those children who didn't participate in sports.



Main findings of previous studies in Japanese children and adolescents

- There are significant relationships between daily physical activity and physical fitness and fundamental motor skills in children and adolescents (Hikiyama et al. 2007, Sasayama et al. 2009, Nakano et al. 2010, Sasayama & Adachi 2011, Tanaka C. et al. 2012, Nakae et al. 2013, Nakano et al. 2013, Niimoto & Yamazaki 2013, Mishima et al. 2013, Tanaka C. et al. 2014, Hanawa 2015).
- The development of seven different fundamental motor patterns (patterns of running, jumping, throwing, catching, ball bouncing, forward rolling, and moving on

a balance beam) and the acquisition situations of these fundamental motor patterns were compared in primary school children (3-to-5 years old) using the results of studies conducted in 2007 (n=154) and in 1985 (n=123) using the observational evaluation method. The motor patterns of the seven fundamental movements in recent young children remained at an immature movement development stage. The acquisition of fundamental movements in recent five-years-olds was similar to that of three-year-olds in 1985. A significant increase was seen with age in both the individual motor pattern scores for the seven movements and the motor pattern development scores (Nakamura et al. 2011).

- The relationships between the frequency of 37 fundamental movement patterns observed by teachers (n=526) in nurseries and kindergartens and motor abilities using 6 items, in 3–5-year-old children (n=11130) were examined. The relationship of the fundamental movement pattern of manipulation with the corresponding motor ability was stronger than that of locomotion. Overall, each motor ability measurement item was shown to be significantly related to various fundamental movement patterns. (Yoshida et al. 2015).
- Among 4th-6th grade primary school children (n= 249), children with lower physical fitness levels had longer screen time, and less time in after school activities such as sports, after school tutoring and/or cultural activities, and outside play. Moreover, the lower fitness levels were associated with high psychological stress reactions and absenteeism, after adjusting for school type and differences in lifestyle (Nagano et al. 2015).
- Elementary school students in grades 5 and 6(n=53) were examined to clarify how physical fitness levels or doing exercise are related to the psychosocial factors that underpin the motivation to exercise. The group with a high rank of physical fitness had a higher recognition of the benefits of exercise, and a lower recognition of

the burdens. Also, the higher rank group scored higher for levels of enjoyment of movement and skill in exercise, as well as family support and approval (Hanawa 2015).

- Physical fitness in elementary school first and fifth grade children with (n=160) or without (n=210) short-term (10min) extracurricular activities (EA) was compared. The distance jogged by the students who participated in EA was 1357 ± 333 m and average speed was 170 ± 42 m/min. Multiple items on the physical fitness test were scored significantly higher in the extracurricular activities group than in non-EA subjects in fifth grade children. On the other hand, there are no significant difference in first grade children (Morimura et al. 2014).

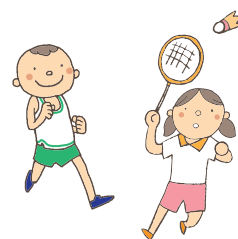
How to improve the grade of the Japan report card

1) How to improve the monitoring system of the Japan report card

- In future Japan Report Cards, children in grades past the first grade should be evaluated using the JSA survey.
- In the future, a regular monitoring system is needed to evaluate the present state of physical fitness and fundamental motor skills of under 5-year-old children including regional and school differences.

2)How to improve the physical fitness of children and adolescents

- It is important that the public realizes that improving physical fitness in children and adolescents can have a positive influence on many aspects of children's lives such as appropriate body weight management, better mental health and better academic achievement, and so on.



7 Weight Status



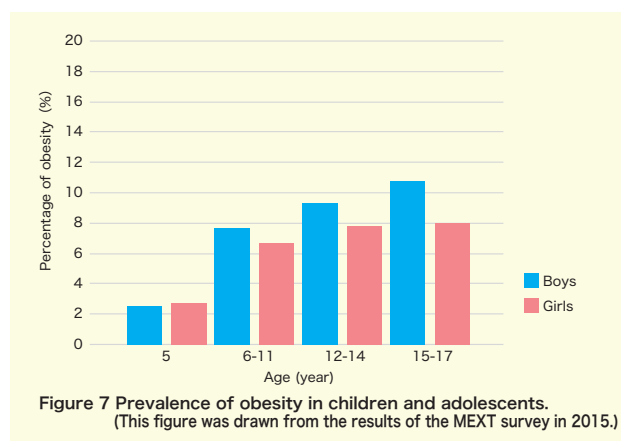
The School Health Survey data (2015) by the MEXT reported that 2.24-11.34% of 5-17 year old Japanese boys and girls were obese. Overall, however, the levels are high compared to the 1980s. On the other hand, the percentage of underweight children was 0.40-4.33%.

The results of the nationwide survey

- The Annual Report of School Health Statistics Research has been continuously conducted every year since 1948 by MEXT to evaluate the growth and state of health in children and adolescents. The participants were randomly selected by prefecture, school type, gender and age using a two-stage stratified random sampling for every school in all age groups. The survey is a national representative survey.

Main findings of previous studies in Japanese children and adolescents

- Thirty years of cross-sectional and longitudinal changes in the prevalence of obesity from 1978 to 2007 in Japanese children and adolescents between 5 and 17 years of age, were investigated using the annual reports



of the School Health Survey published by the MEXT. Cross-sectional analysis of 5-, 8-, 11-, 14-, and 17-year-olds showed that the prevalence of obesity has gradually

decreased since the early 2000s, with the highest prevalence in the late 1990s to early 2000s, except for in 17 year-old boys. Longitudinal studies showed that the critical periods for developing obesity were in early childhood (between 5 and 6 years of age) and in the high school period in boys, and mainly in early childhood in girls (Yoshinaga et al. 2010).

- In the Toyama Birth Cohort Study (n= 9674), obesity was significantly associated with obesity-related lifestyles in three year olds (n=9668). Obese children (n=474) had a larger irregular snack intake (3 or more times), less than 10hrs sleeping time, a larger family, and a mother who worked as compared to non-obese children (n= 8360) (Kagamimori et al. 1999). On the other hand, in the sex and birth month matched comparisons between obese and normal-weight 3-year-old children, the following factors were significantly related with the development of obesity in 3-year-old children: the mother's job, limited playtime outdoors (1 hour or less), irregular snacking, an overweight father (body mass index ≥ 24), an overweight mother (body mass index ≥ 24), and a high birth weight (birth weight $\geq 3,500$ g). An overweight mother or father, limited playtime outdoors, weight at birth, and irregular snacking were significantly related to obesity in 3-year-old children (Takahashi et al. 1999). The cohort elucidated both environmental and behavioural factors that influence body mass index among Japanese children from ages 3–6(n=8170). Significant factors associated with overweight children were rapid eating, short sleep duration, early bedtime, long periods of television viewing, avoidance of physical activity (Sugimori et al. 2004). A maternal family history of hypertension was also positively associated with the risk of being overweight in children at the age of 12 (n= 7249) (Liu et al. 2014).
- In the Ibaraki Children's Cohort Study (n=4592), children cared for by grandparents at age 3 had a higher prevalence of between-meal eating before dinner for boys and girls at ages 6 and 12 years than those cared for by their mothers. By the age of 22, boys who were cared for by their grandparents had a higher risk/chance of being overweight than those cared for by their mothers (18.5% versus 11.2%), but no such difference was noted in girls. However, both boys and girls cared for by grandparents had higher mean BMI over time than those cared for by their mothers (Sata et al. 2015).
- Among kindergarten children aged from 3 to 5 years (n=742) in Shizuoka prefecture, obese children with parents who were also obese spent more time watching TV (more than 3h), and spent less time playing outside the house than non-obese children (Shiraki & Marui 2005).
- Among 3-6yrs olds in the Tohoku region (n=1765), grandparents who care for pre-school children in place of mothers were more likely to contribute to a child being overweight and obese than maternal employment (Watanabe et al. 2011). Children's lifestyles that were significantly associated with above average weight and obesity included irregular mealtimes, watching TV for more than 2h per day and a nighttime sleep duration of less than 10h.
- The multiple relationships between body proportion, physical fitness, and lifestyles of young children were examined using three years of longitudinal data in 148 preschool children. Significant differences were observed in standing long jump and body support time between the obesity trend group and the slim trend group. Regarding lifestyles, the time spent watching TV and

video systems was shorter among children in the slim trend group (Nakano et al. 2013).

- In Japanese 5-6 year preschool children (n=425) in the Kanto region, physical activity in overweight children was comparable to that in normal-weight children. However, thin children spent significantly less time engaged in light-intensity physical activity and MVPA than normal-weight and overweight children, and less time engaged in higher-intensity physical activity than normal weight children (Tanaka C. & Tanaka S. 2013).
- Among 30 Japanese adolescents (11.7 \pm 0.4 year old) in Osaka prefecture, the relationship between percentage of body fat as evaluated with caliper and daily step counts was strong (r=-0.88). The relationship between percentage of body fat and subjectively sedentary activities was moderate (r=0.79). Daily step counts in obese boys (8729 \pm 61450 steps/day) were significantly higher for children than in normal weight boys (247 \pm 629 steps/day). Subjectively sedentary behaviour (246.6 \pm 629.1 min/day) in obese boys (170.8 \pm 611.4 min/day) was significantly higher than in normal weight boys (Mikami et al. 2003).
- Among primary school boys (n=140) and girls (n=159) (9.1 \pm 0.3 years) in Okayama prefecture, the link between body mass index (BMI), peak oxygen consumption, and metabolic syndrome (MetS) risk factors was determined. The MetS risk score of the High BMI group was significantly higher than that of the Low BMI group for both sexes. However, the High BMI/High Fitness group had a significantly lower MetS risk score than the High BMI/Low Fitness group for both sexes (Sasayama et al. 2015).
- Among 131 boys and 171 girls (9-10 years old) in primary school in Nagasaki prefecture, 11000 steps per day were essential in preventing childhood obesity. Additionally, >2 hrs TV viewing per day is a significant risk factor for childhood obesity (OR=3.43). TV viewing time per day was found to be strongly associated with childhood obesity. Sports club participation, breakfast consumption, hours of sleep per night, number of sessions of physical exercise per week, and exercise time per session were not associated with childhood obesity (Minematsu et al. 2015).

Diet

The World Health Organization Guideline "Sodium intake for adults and children" states "the recommended maximum level of intake of 2 g/day sodium (5 g/day salt) in adults should be adjusted downward based on the energy requirements of children relative to those of adults". Therefore, the Dietary Reference Intakes for Japanese 2015 calculated the target values for each sex and age category by extrapolation from the value for adults using the estimated energy requirements. As a result, the target values of intake were set as, 2.5g for boys aged 3 to 5 years, 2.9g for boys aged 6 to 7 years to 5.4g for boys aged 15 to 17 years, and 2.5g for girls aged 3 to 5 years, 2.9g for girls aged 6 to 7 years to 5.9g for girls aged 15 to 17 years, respectively. However, the medians obtained by the National Health and Nutrition Survey were about 1.5 to 2 times of the target values. Therefore, the mean values of the target values based on the WHO Guideline and the current mean intake were adopted as the tentative Dietary Goal for preventing lifestyle-related diseases. It is thought that such conditions should be improved.

As for calcium, current mean intakes are comparable

with or slightly more than the estimated average requirements in children aged 7 to 14 years, while they are obviously lower than the estimated average requirements in children aged 15 to 19 years. Mean intakes of iron were also lower than the estimated average requirements in some sex and age categories. The tentative dietary goal for preventing lifestyle-related diseases for percentage of energy intake from fat is set as 20 to 30 %. In contrast, according to the National Health and Nutrition Survey (2013), the mean intakes for boys and girls aged 7 to 14 years were 29.1% and 29.8%, those for boys aged 15 to 19 years were 27.6% and 31.1%, those intake values are around upper boundary of the tentative dietary goal for preventing lifestyle-related diseases.

According to the results of the National Health and Nutrition Survey and the Dietary Reference Intakes for Japanese 2015, which are based on domestic and international evidence, there are no other nutrients which especially need to be careful at present.

Thus, the nutrients of which are at risk of deficiency are calcium and iron. On the other hand, sodium intake, which is important for prevention of hypertension, was much higher, about 1.5 to 2 times of the dietary goal values for preventing lifestyle-related diseases. Percentages of energy intake from fat are around the upper boundary of the tentative dietary goals for preventing lifestyle-related diseases.

How to improve the grade of the Japan report card

1) How to improve the monitoring system of the Japan report card

- In future Japan Report Cards, grades will be evaluated using the survey of The School Health Survey data and The National Health and Nutrition Examination Survey.
- A regular monitoring system that includes regional differences is needed to evaluate the present state of obesity, being overweight and thinness in children under 4 years old.

2) How to reduce obesity rates and thinness in children and adolescents

- According to the above surveys and previous studies, the state of care at home and lifestyles in preschool children seems to have a great influence on children and adolescents being obese or overweight later in life. Therefore, providing parents and grandparents with access to information on how to care for their children is needed.
- It is important that the public realizes that improvements in daily physical activity, physical fitness and fundamental motor ability and decreasing sedentary behaviour in children and adolescents can have a positive influence on many aspects of children's weight status such as obesity, overweight and thinness, in addition to understanding approaches for improvement.

Settings and Influences on Physical Activity and Health

8 Family and Peer Influence



The National Health and National Survey (2014) reported that daily step counts were 7,860 for males aged 20 to 64 years old, and 6,794 for females, respectively. The prevalence of obesity in Japanese adults was 29% in males and 21% in females which is based on over 25kg /m² of BMI (body mass index). Participation in sport twice or more a week, 30min or more per time over 1 year was reported by 31% of males and 25% of females. In grade 5 Japanese primary school students and second year junior high school students, the percentage of participation in sport or exercise with a guardian more than once per week was 7-36% by the Report of Survey on Physical Strength and Athletic Performance of JSA (2015). The 2015 SSF National Sports-Life Survey of Young People reported that 72% of Japanese preschool children (4-5 years old) participated in exercise or sport with their parent "often" or "sometimes".

The results of the nationwide survey

- The original National Health and Nutrition Survey was conducted in 1946. A total of 3648 households participated in the 2014 survey.
- The percentage of A and B ranks among Japanese adults was 42.5% and 36.5% according to the Report of Survey on Physical Strength and Athletic Performance of the JSA (2014). The percentage of Japanese adults with more than 1/week sports participants was 50.1% and 44.3%, respectively. The recommendation isn't shown.

Main findings of previous studies in Japanese children and adolescents

- According to the national physical fitness survey by MEXT, second year junior high school girls (13-year-olds) with total exercise time under 60min/week, who weren't
- encouraged to participate in exercise or sports by family members were at 37.4%. Adolescents' with total exercise time under 60 min/week who were encouraged to exercise or participate in sports by family members were at 11.3%. Adolescents' with a total exercise time over of 420 min/week who weren't encouraged to exercise or play sports by family members were at 43.8%. Adolescents' with total exercise time of over 420min/week who were encouraged to exercise or play sports by family members were at 72.6%. The encouragement of exercise or sport by family members was positively related with adolescents' exercise time. There was a similar tendency in second year boys in junior high school (13-year-olds), in the fifth year boys and girls in primary school (11-year-olds) (MEXT, 2014).
- There were no significant differences of time in MVPA, as measured using an accelerometer, and family situation (family size, number of brothers and sisters, birth order,

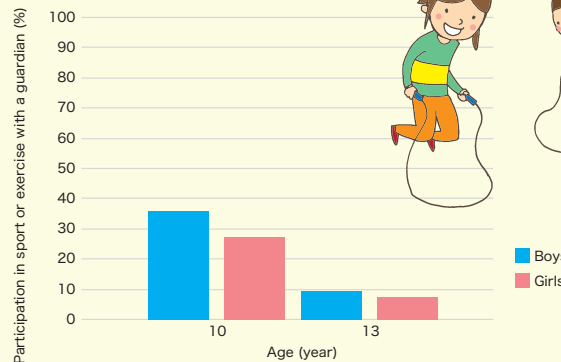
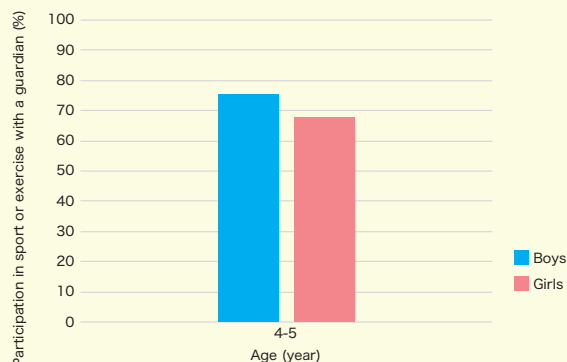


Figure 8 Percentage of children participating in sports or exercise with a guardian.
(These figures were drawn from the results of the JSA and SSF surveys in 2015.)

living with grandparent, age of parents and mother's employment status), number of friends at home, and sleeping time in 213 Japanese 5-6 year preschoolers in the Kanto region (Tanaka C. et al. 2015).

- A survey by questionnaire was conducted at the one and half-year health examination (n=695) and three and half-year health examination (n=995) in Okayama prefecture (Kano et al. 2009). The relationship between children's and parents' TV viewing times were moderate and weak in each survey, respectively. The length of television and video watching time by children was significantly shortened by parental regulations such as deciding the amount of time and fixing times for children to watch television and videos and limiting watching during meals, and other activities such as playing outdoors, or going to day care facilities. The proportion of children who watched less than 2 hours gradually decreased as the mother's viewing time was longer, and the proportion of children who watched TV for 4 hours or more showed significant increases when the mother's viewing time exceeded 4 hours. It was shown that when the parent has a long viewing time, children also easily develop long

viewing times.

How to improve the grade of the Japan report card

1) How to improve the monitoring system of the Japan report card

- In future Japan Report Cards, grades will be evaluated using the survey of the National Health and Nutrition Survey, the JSA and the SSF.
- A future national representative survey of the relationship between participation in sports and family support in children and adolescents is needed.
- Future research on the effect of health in children and adolescents by family and peer support is needed.

2) How to improve family and peers influence of physical activity in children and adolescents

- It is important to show for the public in Japan to understand that family and peer support can positively affect the amount of participation of exercise or sports by children and adolescents.

9 School



The MEXT sets the educational curriculum guidelines for all primary and secondary schools including the content of physical education, the number of physical education classes, and guidelines for school infrastructure and equipment ministry. The guidelines for nursery schools and centers for early childhood education and care are set by the Ministry of Health, Labour and Welfare and the Cabinet Office. Those guidelines require physical activity during childcare for young children. However, physical education in primary schools or active play in nursery schools or kindergarten isn't carried out by specialized course

teachers who have studied physical education. Also, in primary schools, only physical education classes don't use textbooks.

The results of the nationwide survey

- The MEXT sets educational curriculum guidelines for elementary schools, junior high schools, and high schools including the content of physical education classes and the number of classes. The educational curriculum guidelines for kindergartens are also set by the MEXT. The guidelines for nursery schools and centers for early childhood education and care are set by the Ministry of Health, Labour and Welfare and the Cabinet Office. Those guidelines require physical activity during childcare for young children.
- The MEXT produces guidelines for school infrastructure and equipment for physical education or active play in kindergartens, primary schools, junior high schools, and

high schools. The establishment of nursery schools and their facilities related to active play are regulated by the Ministry of Health, Labour and Welfare.

- Physical education in primary schools and active play in nursery schools and kindergartens isn't carried out by specialized course teachers who have studied physical education. Also, in primary schools, physical education classes are the only classes that don't use textbooks.
- According to the MEXT survey, 73.9% of 5th grade boys answered positively to whether they wanted to continue exercise and sports after graduating from elementary school. The percentage of students who have positive feelings towards physical education is high, especially among children who reported having fun in their physical education classes where the percentage was 83.8%. This



is higher than average. A similar tendency was shown in primary school girls and in students in junior high schools of both genders (MEXT, 2014).

- Elementary schools that allocated a physical education teacher (as a full-time job) was only 6 % (JSA, 2015).
- Schools which took the initiative to improve their students' physical fitness was 89.1% in elementary school and 63.2% in junior high school (JSA, 2015).
- In the course of study in elementary school, children (mainly 4th to 6th grades) are given the opportunity to do exercise and sports at school outside of physical education classes throughout the year. This activity, namely "Club Activity" includes sports and cultural activities, and children can voluntarily choose which activities they would like to do. Self-motivated and voluntary extracurricular clubs activities (commonly called "Bukatsu") at school are also stipulated in the course of study for junior high and senior high schools. In junior high schools, 77.4% of boys and 56.5% of girls belong to an extracurricular sports activity club (JSA, 2015).
- According to a physical fitness survey by the JSA, time spent doing physical activity of those who belong to a sports club in junior high school was 990.0 min/week on average and 147.6 min/week in those who do not belong to a sports club (JSA, 2015).
- Fitness levels of children in elementary schools which made concrete efforts to improve the physical fitness of the children (outside of physical education classes) tended to be high when compared to children in schools which did not make any extra efforts (JSA, 2015).

Main findings of previous studies in Japanese children and adolescents

- Among 191 Japanese 5-6 year preschool children in the Kanto region, time spent in high intensity physical activity (physical activity ratio ≥ 4) among children who participated physical education class as preschool children was shorter than that in children who didn't participate (Tanaka C. et al. 2014).
- Scores in the jump over and crawl test and 25 m run speed were lower in children who participated physical education class in preschool than those in children who didn't participate among 191 Japanese 5 -6 year preschool children in the Kanto region (Tanaka C. et al. 2014).
- MVPA was significantly higher for children enrolled in kindergartens than those enrolled in nursery schools (4-6years old, n=157) (Tanaka C. & Tanaka S., 2009b). MVPA on weekdays in girls did not differ significantly both groups, those on weekends in girls were significantly higher for children enrolled in kindergartens than those enrolled in nursery schools. On the other hand, there were no significant differences among boys (n=191) (Tanaka C. et al. 2015).
- Chiba Prefecture implemented the three-year plan to physical fitness in elementary school children (n=700), first through fourth graders, and tested children on their physical fitness twice and among the third through sixth graders. The results showed that Rank A occupied 19.7% and 46.3%. As for Rank E, it showed 7.5% and 2.3%. The physical fitness of the children showed remarkable improvement, and their life-styles have also changed to a large degree (Suzuki, 2008).
- Physical fitness and physical activity were compared in two groups in two primary schools. One school conducted a short-term extracurricular activity by have

the students jog (EA) (training group; n=160 in 1st, 5th to 6th grade boys and girls (wearing a pedometer in 5th to 6th grade: n=24), control group; n=210 in 1st, 5th to 6th grade boys and girls (wearing a pedometer in 5th to 6th grade: n=24)) and the other school did not have its students jog. Physical fitness test results were significantly higher in the EA group than in non-EA subjects. Total step counts were 15485 ± 1915 steps/day for the EA group and 12363 ± 2464 steps/day for the non-EA group on weekdays (Morimoto et al. 2014).

- An intervention study in which primary school children (6th grade) learned the importance of exercise in their physical education class and were recommended to play outside during recess (intervention group n=10 each for boys and girls grade 6th, control group n=10 each for boys and girls grade 6th) was conducted by a primary school in Okayama prefecture for about three weeks. The intervention group had significantly increased physical activity before and after intervention, and the volume of change in the intervention group was significantly higher than that of the control group in both genders on weekdays. However, there were no differences in PA on weekends in both groups (Adachi & Sasayama 2009).
- The present study examined physical activity levels and differences in PA by gender and grades during school recess periods (25 minute break and 15 minute lunch recess) in two elementary schools (n=184, grade 1st to 6th) in Saitama prefecture. Boys had higher vigorous physical activity times than girls in both periods. Younger children engaged in less moderate physical activity than older children during break time. On the other hand, at lunch recess, younger children had significantly longer vigorous physical activity than older children (Sato et al. 2011).
- The effect of turf playgrounds on children's physical activity before and after implementation of turf playgrounds (about 2500 m² on the inside of the track) during recess in primary school was examined using the Lifecorder (n=35 boys, n=21 girls from the grade 3 to 6 of primary school). During the 25minute break, moderate physical activity among girls increased significantly after implementation of turf playgrounds (from 1.3 ± 0.7 min to 1.6 ± 0.7 min). However, the difference was only under 1min. Also, physical activity among boys during the break and physical activity during lunch recess in both genders didn't change (Sato et al. 2012).
- Differences in physical activity during recess according to perceived school environment (equipment, facility, and safety) among 103 public elementary school children in Saitama prefecture were examined using the Lifecorder. During lunch recess, boys in the high-equipment group spent significantly more time in moderate physical activity (high: 1.5 min; low: 0.8 min). Boys in the high-facility group spent significantly more time in vigorous physical activity (2.4 min, 1.4 min) during lunch recess, and girls spent more time in moderate (2.1 min, 1.2 min) and vigorous physical activity (1.9 min, 1.3 min) during morning recess. However, the differences were only under 1 min (Ishii et al. 2014).



How to improve the grade of the Japan report card

- 1) How to improve the monitoring system of the Japan

report card

- In future Japan Report Cards, grades will be evaluated using the educational curriculum guidelines by the MEXT, other guidelines, and the Report of the Survey on Physical Strength and Athletic Performance of the JSA.
- The MEXT, the JSA, and related organizations need to assess the actual situation of physical education classes and activities across schools in a nationwide school survey. In particular, it is important to examine the effects of the allocation of physical education teachers in elementary schools.

2) How to improve school and preschool facilities for children and adolescents

- Physical education in primary schools or active play in nursery schools or kindergartens should be carried out by specialized course teachers who have studied physical education.
- Difference in gender and of growth and development should be considered in physical education class.
- Teachers, researchers, and coaches should be taught the value of physical activity, how to improve physical activity in preschools or schools outside of physical education classes, and at home and/or in the local community. Moreover, teachers, researchers, and coaches should be provided the opportunity to participate in physical activity themselves.

10 Community and the Built Environment



Health Japan 21 (second term) by the Ministry of Health, Labour and Welfare reported that the number of local governments which addressed the need to improve physical environment where residents can easily exercise and be physically active stood at 17/47 prefectures (2012). The 2015 SSF National Sports-Life Survey of Young People reported that 48% of Japanese parents of 4-9 year old children agreed they lived in neighborhoods that allow children to engage into active outdoor play, exercise, or organized sports.

The results of the nationwide survey

- Health Japan 21 (second term) by the Ministry of Health, Labour and Welfare reported that the number of local governments which were trying to provide an environment where residents can easily be active stood at 17/47 prefectures (2012).
- The SSF survey reported that 48% of Japanese parents of 4-9-year-old children agreed they lived in neighborhoods that allow children to engage in active outdoor play, exercise, or organized sports, safely (SSF, 2015).

Main findings of previous studies in Japanese children and adolescents

- 53% of Japanese parents of 4-6 year old children (n=361) reported that they considered their neighborhoods to be safe (Tanaka C. et al. 2011). The relationship between MVPA in preschool children as evaluated by an accelerometer and the perceived safety and availability of natural spaces in their neighborhood as reported by parents was significant. The home environment (house or apartment, number of rooms, presence or absence of a garden, number of total floors or apartment floor, the presence or absence of elevators in an apartment building, the presence or absence of a private motor vehicle) did not relate with MVPA.
- In Chiba prefecture most playgrounds/parks consisted only of space for play equipment. The size of the area was associated with the existence of open spaces or natural spaces in the playground. The kinds of

equipment available were similar among middle or larger size of playgrounds and parks. Moreover, compound playground equipment, was available only in large parks. However, these parks were few in number. With regard to status of utilization, in questionnaires of 4111 primary school children from 1st to 6th grade, "not used" and "1-2 times a week" answers were mostly selected (Hiratsuka & Hikihara 2015).

How to improve the grade of the Japan report card

1) How to improve the monitoring system of the Japan report card

- In future Japan Report Cards, grades will be evaluated using the Health Japan 21 (second term) by the Ministry of Health, Labour and Welfare report.

2) How to improve community and the built environment for physical activity in children and adolescents

- Improvements of sports facilities, playgrounds/parks, and safe sidewalks and bicycle tracks are needed.
- For preschool children, there are different environmental attributes associated with daily MVPA among children between Japan and other countries. Thus, further research is needed for Japanese children over 6years old.
- Detailed data for community and built environment in Japan are needed.
- Further research on the effect of the community and the built environment on the health of Japanese children/adolescents is needed.

11 Government Strategies and Investments



There are many relevant laws and ordinances such as The Basic Act on Sport, the Health Promotion Law, the Basic Act on Food Education, and so on. There are also strategies and policies in place like the Sport Basic Plan, Health Japan 21 (second term) , and so on. Physical activity guidelines are for preschool children, adults, and the elderly. However, national physical activity guidelines for children and adolescents (6-17 years) are not established.

The results of the nationwide survey

- In Japan, the Sports Authority, an external organ of MEXT and the Ministry of Health, Labour and Welfare, is responsible for policies relating to sports, exercise, and physical activity. MEXT has implemented the "National Physical Fitness, Exercise Capacity, and Habits Survey" every year, and the "Public Opinion Survey on Physical Fitness and Sports" at a frequency of once every three to four years. The Ministry of Health, Labour and Welfare has investigated the number of steps and the proportion of exercise habits every year through the National Health and Nutrition Survey based on the Health Promotion Law. However, children 6 years old to 18 years old are not the subject of the survey. In addition, the Ministry of Health, Labour and Welfare has recently been surveying the number of prefectures that tackle urban development and environmental improvement to increase access to exercise.
- Based on the results of the National Health and Nutrition Survey and the evidence of many epidemiological studies for exercise and physical activities, MEXT and the Ministry of Health, Labour and Welfare have respectively established national physical activity guidelines for preschool children and a physical activity guideline for health promotion (Active guide). These guidelines have been adopted as the basis for the planning of measures for each ministry and agency such as the Sport Basic Plan, Health Japan 21 (second term) and Healthy Child 21 (second term). However, national physical activity guidelines for children and adolescents (6-17 years) have not yet been established.
- In local governments, the education, sports, and health-related departments are responsible for measures related to physical activity and exercise. In recent years, there has been an increase in local governments that address urban development and health through initiatives by mayors or governors. The Health Promotion Law obligates all prefectures to formulate and initiate their own health plans.

- In addition to the above, there are relevant laws and initiatives, such as the Health Promotion Law, the School Lunch Program Act, the Community Health Act, the Maternal and Child Health Act, the School Health and the Safety Act, Basic Act on Food Education, toto, and so on.

How to improve the grade of the Japan report card

1) How to improve the monitoring system of the Japan report card

- In future Japan Report Cards, grades will be evaluated using the relevant laws and ordinances, strategies and policies, physical activity guidelines, investments, and enforcement.
- It is necessary to establish guidelines for sport and exercise and physical activity for 6-18 years old children and adolescents.
- Regular and nation-wide surveys for children's growth environment are needed.

2) How to improve the participation levels in organized sports in children and adolescents

- An official national physical activity guideline for children and adolescents between 6 and 17 years old is necessary.
- The understanding and practical use of the official national physical activity guidelines (Yojiki Undou Shishin, 2012) for 3-5 year olds in Japan by preschool teachers and parents should be examined. Also, problems in the field of physical activity for 3-5 year olds should be clarified and solved.
- It is necessary to improve physical education and sports education for children, especially the enhancement of the education system so as not to increase the number of children who dislike playing sports and exercising.
- It is necessary to develop parks and the environment so that every child can safely and actively engage in physical activity.

Next Steps

This is the first version of the Japan Report Card on Physical Activity for Children and Youth. We are planning to publish the report continuously to examine changes to each grade before and after the Tokyo 2020 Olympic and Paralympic Games. We are planning to publish the next Japan Report Card on Physical Activity for Children and Youth in 2018. To do so, we need further funding and are seeking partnerships with individuals or organizations who might consider providing financial or other support—please contact the Active Healthy Kids Japan group (info@activekids.jp) for further information.

The short and long forms of this report card are available from our website (www.activekids.jp). An academic publication based on the 2016 Japan Report Card on Physical Activity for Children and Youth was published in the Journal of Physical Activity and Health.

The Cover of the 2016 Japan Report Card

A stated aim of physical education of the national educational curriculum guideline is to improve physical fitness and to promote a positive attitude toward exercise as a lifelong physical activity. However, as the cover of the 2016 Japan Report Card suggests, students don't move continuously during physical education class, because they have to sit or stand during their teacher's instruction and/or while waiting their turn. It is also worth noting that a recent systematic review of the MVPA content of school physical education globally suggested that a minority of time in physical education classes was spent in MVPA (Hollis et al. 2016).

Acknowledgements

This card was produced with funding from the project research of Japanese Society of Physical Fitness and Sports Medicine in 2015 (2015-2017: Chiaki Tanaka, Shigeru Inoue, Motohiko Miyachi, Koya Suzuki, Takafumi Abe: The Physical education and Medical Research Center UNNAN, Shigeo Tanaka), and with research supports from the J. F. Oberlin University and the Institute of Health and Sports Science & Medicine, the Juntendo University, and was a partnership between the J. F. Oberlin University (Dr. Chiaki Tanaka), the National Institutes of Biomedical Innovation, Health and Nutrition (Dr. Shigeo Tanaka, Dr. Motohiko Miyachi), the Tokyo Medical University (Prof. Shigeru Inoue), and the Juntendo University (Dr. Koya Suzuki), and the University of Strathclyde (Prof. John J Reilly). We are grateful

for the contributions of members of the project steering group and stakeholders who formed a wider working group, especially the members of the Japan Society of Human Growth and Development.

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