

### The Republic of Slovenia

## 2021 REPORT CARD Physical Activity for Children and Youth

## Introduction and Acknowledgements

The 2021 Active Healthy Kids Slovenia Report Card is a two-point snapshot 'state of the republic' report on the overall physical activity of Slovenian schoolchildren and adolescents. The data and figures reported here encompass two distinct time-points: 2018-2020 prior to the COVID-19 pandemic, and the 2020-2021 period whenever robust, novel data existed. This two-point snapshot strategy was undertaken because for many indicators, Slovenia was able to collect data during the first (and subsequent) wave(s) of the pandemic; preliminary and published data have revealed stark differences in children and adolescents' physical fitness and 24-hour movement behaviour (24-HMB) patterns. Details on Report Card methodology are outlined subsequently.

This report card was produced by the University of Ljubljana, Faculty of Sport (Project leads: Dr. Shawnda A. Morrison, and Dr. Vedrana Sember), with significant intellectual contributions by: Dr. Gregor Jurak (Director of the Laboratory for the Diagnostics of Physical and Motor Development, Faculty of Sport, University of Ljubljana), Dr. Gregor Starc (SLOfit system project manager, Faculty of Sport, University of Ljubljana), Dr. Marjeta Kovač (Faculty of Sport, University of Ljubljana), Kaja Meh, M.Psych. (Institute for kinesiological research, Faculty of Sport, University of Ljubljana), Dr. Mojca Golobič (Biotechnical Faculty, University of Ljubljana), Poljanka Pavletič Samardžija, M.Sc. (Republic of Slovenia National Olympic Committee), Dr. Mojca Gabrijelčič (Slovenian National Institute of Public Health), Marko Primožič (Principal of the Ivan Grohar Primary School, Škofja Loka), and Dr. Primož Kotnik, MD (Medical Faculty, University of Ljubljana).

The draft grades were reviewed by all stakeholders from Active Healthy Kids Slovenia (AHKS), with oversight to meet standardised data quality from Active Healthy Kids Global Alliance (AHKGA).

No funding was received for this 2021 Report Card.

### en.slofit.org/research/activehealthykids

### **Table of contents**

Report Card Th	neme: Slov	venians in	Social Trans	sition 4	
Summary of Da	ata Source	es, Bench	marks and G	arading	6
Summary of In	dicators, G	Grades ar	id Benchmar	ks 8	
Overa	ll Physica	l Activity	10		
Organ	ized Spor	rt and Ph	ysical Activ	ity 12	
Active	Play	14			
Active	Transpor	rtation	16		
Seder	ntary Beha	aviours	18		
Physic	cal Fitnes	<b>s</b> 20			
Family	and Pee	rs	22		
Schoo	ols	24			
Comm	nunity and	l Environ	ment 26		
Gover	nment	28			
Sleep	30				
Seaso	nal Variat	tions	32		
Additional Res	ources	34			
Data Sources a	and Refere	ences	35		



### **Contact details**

**Dr. Shawnda A. Morrison**, CSEP-CEP (shawnda.morrison@fsp.uni-lj.si; Centre for Climate Change and Active Children, Faculty of Sport, University of Ljubljana), and **Dr. Vedrana Sember** (vedrana.sember@fsp.uni-lj.si; Laboratory for the Diagnostics of Physical and Motor Development, Faculty of Sport, University of Ljubljana).



### Report Card Theme: Slovenians in Social Transition

The 2021 Slovenian Report Card on the Physical Activity of Children and Youth is the third Report Card prepared by the Active Healthy Kids Slovenia (AHKS) team. Although the immediate period following the 2016 and 2018 Report Cards did not initially bring any drastic changes or developments foreseen to affect children's physical activity (PA) across Slovenia, there were extreme perturbations to daily life following the start of the coronavirus COVID-19 global pandemic. Historically, there has not been a great emphasis on independent research to assess child PA in Slovenia, partly because we have striven as a nation to provide every child with equal opportunities for accessing highquality, structured PA, and partly because we have been systematically charting children's somatic and motor development for their entire schooling period for the past ~35 years. This outlook changed dramatically following the start of the global pandemic health crisis. Slovenian researchers specialising in child PA and fitness are more engaged than ever before, particularly on the international stage, with many AHKS members serving on international committees, advisory boards, and contributing to global initiatives like the World Health Organization (WHO) European Childhood Obesity Surveillance Initiative, NCD Risk Factor Collaboration (NCD-RisC), and of course, the Active Healthy Kids Global Alliance (AHKGA) initiatives.

The 2021 Report Card would like to highlight that Slovenians are in a phase of dramatic social transition. This concept, developed by the WHO, describes a hypothetical 'social transition model' for nations moving from a poor to affluent society (WHO, 2014, **Figure 1**). The model presupposes that on its path from poor to affluent status, the trajectory of a given health indicator will follow a U-shape pattern, first observing initial changes to the measure before that data returns to its start point as societal affluence is achieved. For example, the term 'nutrition transition' is used to describe large population shifts encompassing factors that impact childhood nutrition, including dietary and PA, (or inactivity) patterns. Transitional societies are typically converging on a 'Western' style diet high in saturated fat, sugar, and refined foods, and low in fibre, increasing the odds for chronic morbidity. The rate at which dietary and PA habits have changed in children and adults alike appears to have accelerated; importantly, nutritional transitions can be especially observable in transitional societies, like Slovenia. The Republic of Slovenia is a post-socialist society in which dietary and PA patterns has shifted, almost overnight. These deviations are rapid and clearly identifiable. The WHO theoretical model of social transition does not dictate a particular timeframe when this U-shaped phenomenon stabilises, but it is safe to assume that every society will behave along its own unique timeline, as other external factors (e.g., civil unrest, food scarcity, political changes) may preclude reaching stable affluence quickly.

To this end, we believe Slovenia has been experiencing at least four major societal transitions within the past several decades. To have a society continuously bombarded with profound changes, across multiple cultural spheres of influence, does not allow for a timely return to an 'ideal', or rather, stable state for the health variable one is tracking (e.g., child PA or fitness). From the figure above, we see that in the early 1990s, when diet and western-style foods were first introduced to Slovenia, these foods were more common to procure for everyday citizens, and the society started a nutritional transition that would significantly alter the fitness and fatness of its population for many years. In 1991, Slovenia also became the first republic to split from the former Yugoslavia and become a sovereign state in its own right. The introduction of

the smartphone in 2009 has had far-reaching effects on young people everywhere, and Slovenia is no exception to the influence of daily technology use. Although Slovenia is considered a 'developed' country, with an advanced, high-income economy, and ranking 'very high' on the Human Development Index, with one of the lowest Gini rates of income inequality in the world, this 1-2-3-4 punch to daily living traditions represents a profound challenge to society. Slovenia must now grapple with the separate and combined ramifications of each external factor in its efforts to preserve the public health of its citizens. Notably, each of these transitions can *negatively* influence paediatric PA patterns (i.e., poorer nutrition, (relative) political instability, increased sedentary behaviours, and isolation/freedom of movement challenges during COVID-19). Although Slovenia has had some modest success reversing negative trends in childhood obesity rates (Sorić et al 2020) and improving aerobic fitness trends (Morrison et al, 2021, Potočnik et al, 2020), the extreme health detriments observed in child fitness over the course of this pandemic has underscored an urgent need for advocacy and robust public policies to ensure every child has access to high-quality PA and education over the course of their entire development, in order to avoid catastrophic future health outcomes for the nation moving forward.



**Figure 1.** World Health Organisation (WHO) theoretical model (dashed black line) of what generally happens to a culture during social transition from one state (e.g. change in nutrition/food availability) to a new social norm. There is usually a dip (e.g. decrease in fat free mass), before the society adjusts to the 'new normal' and returns to their preperturbed state.

In the past 4 decades, Slovenia has undergone massive transitions to 4 key elements which would affect child physical activity levels: (1) nutritional- increased availability of 'western' style, nutrient dense food, (2) political-socialist state to independent democracy (3) technological-advent of ubiquitous smart phones, screen times, and (4) COVID-19 global pandemic and movement restrictions associated with disease mitigation measures.

### Summary of Data Sources, Benchmarks and Grading

This section details information on the indicators and benchmarks used for the 2021Slovenian Report Card, including all data sources used to grade the indicators, and an overall 'confidence' score which has been applied using a standardised approach. The Report Card leaders felt it was extremely important to critically evaluate the quality, depth and breadth of the data used to grade each indicator and benchmark, since previous iterations of the project may have relied on smaller sample sizes which were not always nationally representative, or methodology which was primarily subjective in nature (e.g., questionnaires, parent-child proxy answers). Thus, a new 'confidence' score is included beside each indicator grade. This confidence score is a 4-point 'sneaker' scale which encompasses the following four questions: (1) Is the data nationallyrepresentative? (2) Is the data both objectively and subjectively measured? (3) Is the data diverse (e.g., representing a wide range of age, gender, location, socio-economic factors), and (4) Is the data repeatable? Data that has been objectively measured, reflecting a diverse, national perspective, and has been replicated (or explained in sufficient detail to be replicated in the future), would attain our top sneaker rating. Failure to meet one of these criteria would remove a sneaker from the confidence rating.

The Slovenian grades and rationale are outlined and explained in detail here. Historically, one of the most comprehensive sources of child PA data was, and remains, the ACDSi study (Jurak et al, 2013, Starc et al, 2015) which is a decennial, multistage, stratified sampling study first launched in 1970, and performed every ~10 years since. Briefly, 10 research project sites were selected according to four types of Slovenian settlements (village, rural town, industrial town, and city) and regions. Data collection of the most recent iteration took place between September and October 2013 (primary schools) and September and October 2014 (secondary schools) and includes (among physical fitness and other things) information on self-reported and parent-reported PA behaviours in 6- to 19-yearolds (n=5,422, ~2% of entire school population for each grade), derived primarily from the CLASS and SHAPES questionnaires, respectively. ACDSi data collection is scheduled to occur in the fall of 2023/2024, and we eagerly await the next opportunity to gather such comprehensive PA and fitness data. When combined with the SLOfit annual surveillance of direct physical fitness and anthropometry monitoring in (nearly) every schoolchild in Slovenia, the country tends to have a fairly comprehensive snapshot of its state of affairs in terms of the standardised Global Matrix indicators and benchmarks. Indeed, large portions of the 2013/2014 ACDSi data were used to produce our maiden 2016 Report Card, and we later performed additional novel analyses to supplement the 2018 Report Card's existing evidence. However, for this 2021 Report Card, AHKS decided not to rely so heavily on the ACDSi 2013/14 dataset as a primary resource for a third time since it represents information which is now >6-7 years old, and we believe the data would not be appropriate to reflect the massive changes in paediatric PA patterns throughout the 2020-2021 calendar year, when strict pandemic movement restrictions were enacted at various times across the country. Therefore, this Report Card preferentially sought out up-to-date national annual government policy documents, and buttressed these data with internal SLOfit reports, in addition to traditional published, peer-reviewed sources. We have differentiated the types of resources used in the Data Sources section presented at the end of this report.

For more information on the standard methodology used to create this Report Card please refer to information

found on the Active Healthy Kids Global Alliance online web portal (AHKGA; www.activehealthykids.org), our previous Active Healthy Kids Slovenia Report Cards and publications for 2016 and 2018, respectively, or you can direct inquiries to the project leaders **Dr. Shawnda Morrison**, shawnda.morrison@fsp.uni-lj.si and/or **Dr. Vedrana Sember**, vedrana.sember@fsp.uni-lj.si.

Grades are determined as defined by the AHKGA methodology, namely the % of children and adolescents meeting an evidence-based benchmark using the grading scheme below.



### **Summary of Indicators, Grades and Benchmarks**

### **Overall Physical Activity**

(1) % of children and youth who meet the Global Recommendations on Physical Activity for Health, which recommend that children and youth accumulate at least 60 min of moderate- to vigorous-intensity PA per day on average.



**A**-

### **Active Play**

- % of children and youth who engage in unstructured/ unorganized active play for several hours a day.
- (2) % of children and youth who report being outdoors for several hours a day.

YAN S

### **Sedentary Behaviours**

 % of children and youth who meet the Canadian Sedentary Behaviour Guidelines (5- to 17-y-olds: no more than 2 h of recreational screen time per day).



B+

### **Family and Peers**

- (1) % of family members (e.g., parents, guardians) who facilitate PA and sport opportunities for their children (e.g., volunteering, coaching, driving, paying for membership fees and equipment).
- (2) % of parents who meet the Global Recommendations on Physical Activity for Health, which recommend that adults accumulate at least 150 minutes moderate to vigorous physical activity (MVPA) throughout the week or do at least 75 minutes of MVPA throughout the week or equivalent combination.
- (3) % of family members (e.g., parents, guardians) who are physically active with their kids.
- (4) % of children and youth with friends and peers who encourage and support them to be physically active.
- (5) % of children and youth who encourage and support their friends and peers to be physically active.



### **Organized Sport and Physical Activity**

(1) % of children and youth who participate in organized sport and/or PA programs.

### Active Transportation

(1) % of children and youth who use active transportation to get to and from places.



#### **Physical Fitness**

- (1) Average percentile achieved from Table S4c from Tomkinson et al. 2017 across age and sex for available data.
- (2) % of children and youth who meet criterion-referenced standards for muscular strength.
- (3) % of children and youth who meet criterion-referenced standards for muscular endurance.
- (4) % of children and youth who meet criterion-referenced standards for flexibility.

### Schools

- (1) % of schools with active school policies (e.g., daily physical education (PE), daily PA, recess, "everyone plays" approach, bike racks at school, traffic calming on school property, outdoor time).
- (2) % of schools where the majority ( $\geq 80\%$ ) of students are taught by a PE specialist.
- (3) % of schools where the majority (≥ 80%) of students are offered the mandated amount of PE (for the given state/territory/region/country).
- (4) % of schools that offer PA opportunities (excluding PE) to the majority (> 80%) of their students.
- (5) % of parents who report their children and youth have access to PA opportunities at school in addition to PF classes.

A

(6) % of schools with students who have regular access to facilities and equipment that support PA (e.g., gymnasium, outdoor playgrounds, sporting fields, multi-purpose space for PA, equipment in good condition).

### **Community and Environment**

- (1) % of schools with active school policies (e.g., daily physical education (PE), daily PA, recess, "everyone plays" approach, bike racks at school, traffic calming on school property, outdoor time).
- (2) % of schools where the majority ( $\geq$  80%) of students are taught by a PE specialist.
- (3) % of schools where the majority (≥ 80%) of students are offered the mandated amount of PE (for the given state/territory/region/country).
- (4) % of schools that offer PA opportunities (excluding PE) to the majority (> 80%) of their students.
- (5) % of parents who report their children and youth have access to PA opportunities at school in addition to PE classes.
- (6) % of schools with students who have regular access to facilities and equipment that support PA (e.g., gymnasium, outdoor playgrounds, sporting fields, multi-purpose space for PA, equipment in good condition).

#### Government

- (1) Evidence of leadership and commitment in providing PA opportunities for all children and youth.
- (2) Allocated funds and resources for the implementation of PA promotion strategies and initiatives for all children and youth.

D-

D

(3) Demonstrated progress through the key stages of public policy making (i.e., policy agenda, policy formation, policy implementation, policy evaluation and decisions about the future).

#### \*Sleep

(1) % of children who meet international AASM (American Association of Sleep Medicine) standards for nocturnal sleep duration for their age category.



#### \*Seasonal Variations

- (1) % of children who remain consistently physically active throughout the year, i.e., for daily PA deviations greater than 5% between calendar months by season, one letter grade will be reduced or advanced accordingly.
- (2) % of children who report greater sedentary behaviours within a given season compared to other months of the year and can be attributed to weather events or seasonal variations in weather (e.g.,

The 2021 Republic of Slovenia Report Card on Physical Activity of Children and Youth

heatwaves, polar vortex, midnight sun, etc.).







D+

# Overall Physical Activity

OVERALL GRADE	2018-2020	2020-2021	Data Confidence Score
А-	Α-	<b>A-</b>	Long Long Long

**Benchmark:** % of children and youth who meet the Global Recommendations on Physical Activity for Health, which recommend that children and youth accumulate at least 60 min of moderate- to vigorous-intensity physical activity (MVPA) per day on average.



In 2016, we reported that in Slovenia, 97% of boys and 95% girls ages: 6 to 11 years were meeting WHO recommendations for daily PA. These data backed up by objectively measured data from a sample of 11-yearolds from Ljubljana, which confirmed that almost all children met WHO recommendations. Combining the data, we found that in younger (age 6-11 y) and older children (12–18 y), 86% of boys and 76% of girls met PA guidelines, and we gave an overall rating of (A-) for this indicator. Revisiting the ACDSi dataset in 2018, we reported in that Report Card that over 80% of children between 6 to 19 are meeting WHO PA guidelines according to self-reported data from that study, but objectively assessed PA showed that the 60 minutes of daily MVPA needed is achieved by 88% 11-year-olds, whereas this proportion drops to 66% in 14-year-olds. We again gave an overall rating of (A-) for this indicator.

From 2018-2020, as part of an ongoing European project (EUPASMOS), Premelc et al (2022) reported in a sub-sample (N=108, N=48 boys, 11-14-yearolds), objectively measured data (UKKRM 42 accelerometers), 25% of children were meeting the previous WHO recommendations for achieving at least 60 min MVPA every day, when using the current guidelines of attaining 60 min MVPA on a weekly average. We revisited the EUPASMOS database to calculate total weekly average MVPA of all children in the study (N=219, aged 8-17 years) and found that 82% were meeting the current WHO recommendations (A-). Data reported from the ongoing Health Behaviour in School-aged Children (HBSC) study in their 2018 report found that for the ages of 11, 13, 15 and 17, children report being physically active at least 2 to 3 times per week in their free time, and 73.5% of young people are active in sport clubs (Jeriček Klanšček et al, 2019).

Although up to date, objective data is lacking for this measure from 2020 onwards, there is self-reported evidence that Slovenian schoolchildren (ages 6-18 y) were meeting PA guidelines on average 5 out of 7 days per week, with 26.7% meeting MVPA guidelines everyday, placing them first amongst 10 countries surveyed (Kovacs et al, 2020). Data for this study were collected using a 7-day recall measure which was used to assess the PA and screen time of the children. Questions regarding self-isolation and total screen time were identical to the ones used for an online survey conducted in Canada (Moore et al., 2020). Additionally, a smaller repeated-measures study conducted at the height of the first wave lockdown (evidence gathered between March-May 2020) found that children were accruing more MVPA minutes on weekends during lockdown compared to pre-pandemic times (Morrison et al, 2021). Finally, data retrieved from the national fitness database was queried via the My SLOfit app, where N= 239 children and youth, aged 11-15 years, self-reported via SHAPES questionnaire that 82.4 % (A-) were meeting WHO recommendations for the mean weekly PA levels.

# Organized Sport and Physical Activity

OVERALL GRADE	2018-2020	2020-2021	Data Confidence Score
С	C+	С	

Benchmark: % of children and youth who participate in organized sport and/or PA programs.



In Slovenia, high performance sport data are compiled each year in annual reports and released by the government. Although it is not possible to be entirely sure of the exact percentage of children and youth who participate in organised sport, a gross estimate can be made based on the number of school-aged children and number of children enrolled in out-of-school clubbased sport. Participation estimates for 2018-2019 indicate 17.3-18.2% of 6-14-year-olds are enrolled, and this proportion decreased in the 2020-2021 timeframe to 11.2 to 16.7% (F, data based on total number of school children enrolled at school and total number of children enrolled in sport clubs nationwide). Previous data collected from the ACDSi study (2013/2014) found that 60% of boys and 47% of girls aged 6-19 reported being engaged in extracurricular sport practice or clubs at some point that year (C+).

There are other data available which were used to directly grade this metric. These include (1) number of registered sport organisations active in the country (2018: 8,187, 2019: 8,152, 2020: 8,178, 2021: 8,318), (2) the number of registered sportspersons according to the Law of Sport, from ages 6-16 years (2018: 33,916, 2019: 32,164, 2020: 32,215, 2021: 21,714), (3) the number of possible active days for training and competitions from ages 6-16 years (2018: 365, 2019: 365, 2020: 224, 2021: 178-187 days, depending on legislation), and (4) national funding for sport (2018: 23,720,482  $\in$ , 2019: 20,569,754  $\in$ , 2020: 22,398,795  $\in$ , 2021: 26,107,369  $\in$ ). The data demonstrate that in Slovenia, there was a move from the same (or slightly less) number of registered sport organisations in 2018 to significantly more in 2020, and there was more revenue gained from organised sport in 2019 (271,232€) compared to 2018 (265,907€), which is also a positive step, since it shows organised sport can be profitable. Revenue fell considerably in 2020 (217,151€). The total number of sportspeople aged 6-16 years has decreased in the interim though, especially in 2020, as mentioned above. The number of possible active training days was decimated during COVID-19 lockdowns, remaining variable to present day; and although there are positive trends in the national funding for sport (which decreased from 2018 to 2019, before increasing again in 2020), investment has still not reached 2018 levels. On balance, for the 2018-2019 epoch, data indicate there is no significant change in number of children participating from the previous 2018 Report Card data, so the grade remained unchanged, but for 2020-2021, there is clear evidence that despite more money being allocated to organised sport, it has not translated into more children and youth participating in the many sport clubs active across the country, causing the overall grade for this measure to decrease by one step. Data were retrieved from official government annual reports from the Ministry of Education, Science and Sport, and the National Statistics Office. We therefore have full confidence that the information is as accurate and up to date as possible for this indicator.



**Benchmarks:** (1) The % of children and youth who engage in unstructured/unorganized active play for several hours a day and (2) % of children and youth who report being outdoors for several hours a day.



In 2016, data for this indicator were derived from questions querying parents on how much active play occurs in the home (e.g., playing in the house yard, roller-skating outside, playing catch, riding bike, etc.) from the CLASS guestionnaire used in the 2013/14 ACDSi study, which found that on school days, only 16% of boys and 19% girls aged 6 to 11 years play actively for more than 2 hours per day (~F), but on weekends, this figure increased to 57% and 59% (~C) for boys and girls, respectively. Combining weekday and weekend outdoor play data revealed that 29% of boys and 30% of girls played outside more than 2 hours per day (D). In 2018, Active Play was again rated 'D', based largely on the same data source (i.e., less than 1/3 of children play actively more than 2 hours per day). The authors argued that although this number appears small, it is in fact not so discouraging, since many children who play actively outside are often not the ones who are involved in organised sport, and since Slovenia ranks as one of the safest countries in the world (i.e., kids still can/do play outdoors, anecdotally), the main reason for not engaging in daily active play was a perceived lack of time, or sometimes access to playgrounds (See Government section).

In 2020, remarkably, novel data surveyed during the height of the first lockdown (Feb–May 2020) found that 56% of children played outdoors more than 2 hours per day (Kovacs et al, 2021), and child PA patterns were reversed, such that levels of MVPA were reported to be higher on weekends than weekdays (Morrison et al, 2021, Meh et al, 2021). These family activity patterns were confirmed (in principle) after interrogating the Google Mobility reports feature which found that from March 26 to May 7, 2020, during the first-wave pandemic lockdown there was a 37% increase in Slovenian movement patterns from baseline in terms of visits to, and length of stay in, public outdoor spaces like national parks, marinas, public gardens, and public beaches. Data were also retrieved for the largest urban center (Ljubljana, Slovenia, population: 272 220) which found significant increases of 11% in outdoor mobility trends, even for these urban dwellers (Morrison et al, 2020).

Although these trends in Active Play are promising, we would like to emphasise that our data confidence score is only two sneakers, since the novel data collected was primarily questionnaire based, it is not nationally representative, and it may be open to some sampling bias. Concerted efforts to improving how to quantify this indicator is ongoing, with objective 24-HMB data collection taking place across several current projects, for example.

# Active C Transportation

OVERALL GRADE	2018-2020	2020-2021	Data Confidence Score
С	C	INC	12 may

Benchmark: The % of children and youth who use active transportation to get to and from places.

In 2016, the ACDSi data (N = 5,207) indicated that active commuting to school remained relatively stable for school-aged children and youth, with ~52% of boys and ~50% girls from age 5 to 18 years actively commuting to school (C). By 2018, we again returned to the ACDSi data to report that almost 49% of children commute actively to and from school, where an additional 12% of children commute actively from school only. The re-analysis found that highly educated mothers (who start their workday around 9 AM) were the ones most often driving their children to school. They reported doing so out of convenience on their way to work, not because of a perception of unsafe school routes, for example.

More recently, a 2020 study<sup>1</sup> on children's travel habits showed that many children are still driven to school or kindergarten by cars, even for very short distances. Survey data found that 68% of parents report taking their children to school or kindergarten by car occasionally, with 23% of them driving everyday and 13% several times a week. Indeed, 14% of children who go by car live less than 500 m away (!), and 18% live at a distance between 500 m and 1km from their school/ kindergarten. Of pre-school children (~11 months to ~5 years old), more than half (55.5% and 50.5%) are usually driven by their parents by car to or from kindergarten, and 10% of those with a kindergarten less than 500 m away use car. Of primary school children, 41.0% walk to school, 23.6% are driven by car and 20.0% by school bus. Encouragingly, of children who live up to 500 m from secondary school, 97% go to school on foot and only 2% are driven by car. In the afternoon, less than one third go home on foot, and more than one third use the car.

An example of good practice public policies is the 'Pešbus' and 'Bicivlak' initiatives, where one volunteer parent or teacher collects children enroute to school and accompanies them either walking (Pešbus in lower grades of primary school) or by bike (Bicivlak in higher grades) to their destination. Since 2016, Pešbus has operated in around 100 schools across Slovenia. The main purpose of this government funded Active in School and Healthy City program is to promote active mobility and create a healthy living environment. The program includes three key activities: (1) forming local partnerships to prepare walking plans and promote walking, (2) disseminating knowledge for planning a healthy living environment and (3) support for the implementation of the monitored route to the school with Pešbus and Bicivlak. In their government reports, 12.4% of parents who have children in the lower grades of primary school report using Pešbus regularly whereas 11.4% of respondents do not have this option. Only 4.7% of parents who have children in the upper classes report using Bicivlak 'several' times, whilst 13.6% doesn't have that option.

Data for this indicator rely heavily on older data from the ACDSi study, or surveys conducted via subcontracting for a given government agency or reporting from ongoing initiatives. We are therefore confident that the overall number of children and youth engaging in active transport remain within the C range (i.e., succeeding with about half of children, 47%-53%), but the fact schools were closed for large chunks of 2020-2021 render grade assessment for that time-period as incomplete (INC).

<sup>1</sup> Study note: Zakaj ljudje potujejo tako, kot potujejo? (IPoP – Inštitut za politike prostora) 2020 Ninamedia, d. o. o. The survey took place from 15 to 27 April 2020 and included an online CAWI survey via an online panel and a random sample on social media. The survey was at a time when the covid-19 coronavirus epidemic was declared, and the survey asked respondents to refer to the period of normality. The sample is representative by gender, age groups, educational structure and statistical regions and covered the general population (15 and more years), namely 2859 persons. In total, 32.9% of respondents (n=940) have at least one minor child.



## Sedentary Behaviours

OVERALL GRADE	2018-2020	2020-2021	Data Confidence Score
C+	В	C	Long Long

C+

**Benchmark:** % of children and youth who meet the Canadian Sedentary Behaviour Guidelines (5- to 17-y-olds: no more than 2 h of recreational screen time per day).

18 The 2021 Republic of Slovenia Report Card on Physical Activity of Children and Youth

In our first 2016 Report Card, we reported that 74% of boys and 79% of girls aged 6 to 19 years met the screen time recommendations, but there were large differences depending on which day of the week were sampled. During weekdays, children were in an A+ range, whereas on weekends this dropped to ~C levels; these were averaged for a sedentary behavior grade of B+ overall. In 2018, results were largely the same, with over 70% of children meeting the screen-time recommendations of no more than 2 hours per day. We noted that girls seemed to be less sedentary than boys, who reported spending more time behind their computers.

More recently, Kovacs and colleagues (2020) reported that 48.7% (C) of Slovenian children sampled (N= 1,897; 802 boys) were meeting the 2-hours or less screen time recommendations on weekdays in 2020. This rose to 55.8% (C+) for weekends (data was collected ~May 2020, when weather was better, and schools were re-opening). This reversal of typical weekday/ weekend trends were later confirmed in a small, repeated-measures study on N=62 school children the majority of whom were sampled from a very physically fit region of Slovenia (Žiri); researchers found that although MVPA decreased by ~46 minutes per day, screen time demonstrated a significant interaction effect such that they spent less recreational screen time on weekends during lockdown compared to when there were no movement restrictions in place (Morrison et al, 2020). Children meeting weekday/weekend screen time recommendations before lockdown were 75% (B+) and 54.7% (C+), which changed to 65.6% (B-, weekday) and 70.3% (B, weekend) during lockdown for this sample. Data were also gueried from the SLOfit online database and the accompanying My SLOfit App, an electronic resource where parents and children receive support, guidance, and feedback on their fitness scores. During the COVID-19 era between 2020-21, researchers asked participants how often they were engaged in recreational screen time activities. For 2020, 34.7% were meeting the criteria (N=95), and in 2021, children and youth aged 11- 15 y (N=133), 46.6% (mean 41.6%, C-) were meeting the criteria. Data were queried during Nov-Dec 2020, when the public schools were closed to in-person instruction. Finally, a Joint Research Centre European Commission technical report was conducted in the spring/summer of 2020 including 11 European countries to query how children (10-18) experienced

online risks during the Covid-19 lockdown in Spring 2020. Slovenia was a participating country with N=506 schoolchildren aged 10-18 years (female=45%) surveyed from 23.06 to 3.7.2020 on various aspects of their online behaviour (Lobe et al, 2021). The report found that Slovenian children reported spending 6.69 hours online on a typical weekday, with 3.85 hours spent online for only schoolwork (therefore, 2.84 h leisure hours online). Furthermore, 54% of children reported that they spent more time online than before the pandemic. Data were not broken down in greater detail, so it is unclear which proportion of children were/were not meeting the 2 hour maximum screen time criteria, but it is safe to say that when the schools were closed, screen time, and thus, sedentary behaviours skyrocketed.

Clearly, there is large variation in the recent data for this indicator, due to lower sample sizes and regional disparities. Although the most recent 2020-2021 data are consistent in terms of pattern and magnitude, they are based largely on subjective data. The authors also emphasize that these measurement tools specify 'recreational screen time' only, and do not include remote or online schooling practices, which were known to increase drastically during the pandemic. Therefore, further research is needed to better quantify this metric. As such, we took the most conservative approach when grading this indicator, and our grading confidence score is only 2 sneakers for Sedentary Behaviour.



## **Physical Fitness**

OVERALL GRADE	2018-2020	2020-2021	Data Confidence Score
Α	A+	А-	

**Benchmark:** Average percentile achieved on certain physical fitness indicators based on the normative values published by Tomkinson et al. (2017).

Slovenia included Physical Fitness as a country indicator in our 2018 Report Card. The grade was based on the proportion of children who were achieving adequate levels of physical fitness based on the SLOfit Physical Fitness Index. The PFI is calculated as a percentile value of the mean of percentiles of all 8 fitness tests included in the SLOfit test battery. Centiles were calculated stratified by age and sex for all Slovenian children aged between 6 to 19 from 1989-2018, which found that 89.6% of boys and 89.9% of girls were achieving adequate levels of this metric. The original indicator grade was high (A-).

The Global Matrix 4.0 now includes Physical Fitness as one of their standard PA indicators, with a published international standard as its benchmarking criteria. This is an excellent peer-reviewed and evidence-based source, however using this paper as the sole criteria for grading the Physical Fitness component is problematic for Slovenia because we have only one comparable measure to the article: standing broad jump. In the SLOfit test battery (see: Jurak et al, 2020) we don't measure flamingo, our plate-tapping test is a sitting version with an electronic board whereas the Eurofit protocol has a standing version with manual counting, there is no sit and reach since we use a stand and reach protocol, sadly no hand grip either; we do have sit-ups, but they are measured in 60 second epochs not in 30 second ones, and our bent arm hang is done with an under-grip, not over-grip technique. Perhaps, these deviations are a result of the SLOfit protocol being piloted and developed independently in the 1960s in the former Yugoslavia. At any rate, many of these Eurofit tests are covered in the ongoing decennial ACDSi study, but as mentioned previously data will not be updated until 2023/24.

From previous work, we know that cardiorespiratory (CRF) fitness in Slovenian children is universally high, where boys and girls of all ages meet or exceed international health risk cut-offs (Morrison et al 2021, A+). This study compared nationally representative data from 9,426 healthy schoolchildren (6-14 years old) to determine changes in CRF across three generations, in 1993 (n = 3,174), 2003 (n = 3,457) and 2013 (n = 2,795), and found that although 20m shuttle run performance declined 2.8% from 1993 to 2003 (independent of age or sex of the child), this trend was reversed in 2013, increasing by 8.2% across all age groups for a net increase of 5.4%. Even children from the 'worst' 2003 generation met the criteria for lowest health risk (Ruiz et al, 2016), with the most recent generation of girls meeting boys' CRF standards 80-100% of the time (ages 8 - 14 years, A/A+). There is no reason to believe these data would be different for the 2018-2020 timeframe of the current Report Card. We believe it would be a pity to waste our unique database and not grade the Physical Fitness indicator, since our annual measurements including both younger and older (ages

5 to 19) children than the benchmark work, and our PFI incorporates the same fitness indices as Eurofit (i.e., tests of musculoskeletal strength, power, balance, coordination, flexibility, reaction time, aerobic fitness), only with slightly different methodology, precluding direct comparison. When comparing centile values for all children (6-19 y) standing long jump scores from the FitBack data portal, we find that 81.8% of all Slovenian children meet the health zone cut offs of the Thomkinson paper (A-) https://www.fitbackeurope.eu/ en-us/fitness-map.

We present PFI data for the entire history of SLOfit testing, beginning in 1989 (**Figure 2**). Negative secular trends in PF are apparent from 1999 to 2011, which prompted a national PA intervention programme called "Healthy Lifestyle" (see: 2018 Report Card for details). By 2018-2019, child fitness was at an all-time high for Slovenia, with girls surpassing boys' fitness by a considerable margin.



The Physical Fitness Index (PFI) is calculated from the mean centile values of all tests separate for each sex. The trend line is calculated on pooled SLOfit data from 1989-2021. A value of 50 represents the average PFI for a given period. Thus, deviations from 50 indicate better or worse overall population fitness compared to the mean of that entire period.

**Figure 2.** Secular trends in the Physical Fitness Index from 1989 to present. The y-axis represents centile scores of girls (red line) and boys (blue line) for each year of national testing. Consistent declines in fitness from 1999 to 2019 prompted the Healthy Lifestyle Intervention programme, a national initiative aimed at introducing extra PA minutes for schoolchildren across the country. In one year alone the COVID-19 pandemic has erased child fitness gains that took over a decade to develop (Potočnik et al, 2021). Recovery strategies are now being brainstormed at the national level to address this growing crisis in child fitness and health.

COVID-19 2nd and 3rd wave

# Family and Peers

OVERALL GRADE	2018-2020	2020-2021	Data Confidence Score
B+	B+	INC	

**B+** 

**Benchmarks:** (1) % of family members (e.g., parents, guardians) who facilitate PA and sport opportunities for their children (e.g., volunteering, coaching, driving, paying for membership fees and equipment). (2) % of parents who meet the Global Recommendations on Physical Activity for Health, which recommend that adults accumulate at least 150 minutes MVPA throughout the week or do at least 75 minutes of MVPA throughout the week or equivalent combination. (3) % of family members (e.g., parents, guardians) who are physically active with their kids. (4) % of children and youth with friends and peers who encourage and support them to be physically active. (5) % of children and youth who encourage and support their friends and peers to be physically active.



Quality evidence remains scarce for this benchmark in Slovenia. In 2016, we did not grade this indicator (INC). In 2018, we revisited the ACDSi database, and found two questions related to this benchmark. We performed custom analyses on the relevant data and observed that 75% of parents reported encouraging their child to be physically active, and over 80% of parents (B+) report providing material or logistical support to encourage PA in their children (e.g., paying fees, rides, equipment).

One recently published study, performed in autumn 2018 (October to November), was conducted to investigate whether family PA habits affect their children's PA (Zovko et al, 2021). The sample included N=174 children (77 boys, 97 girls, 11-14 y,) and their families (N=225 parents, N=52 grandparents) who wore accelerometers continuously for one week to determine PA levels of children, parents, and grandparents. The authors report that mothers' MVPA was associated with their child's MVPA, and fathers' sedentary time was associated with boys' sedentary time. After adjusting for age, BMI (child), and educational status, results were unchanged. Data on this variable remain scarce in Slovenia, likely because other areas of society have been tasked with ensuring children and youth receive enough high-quality PA in school, youngsters are active in sport clubs, there is excellent investment at the community level for things like parks, gymnasium halls and infrastructure paths/ parks and trails (see corresponding indicators), so this is by far the weakest indicator to rank objectively, and receives only one sneaker as a result. Family and Peers must be better quantified in future, especially since during pandemic times when other societal structures of support (Schools, Government, Community) are/have been forcibly removed (i.e., pandemic mitigation measures like lockdowns), so that now the burden of ensuring adequate PA for children has been transferred more so to Family and Peers. It was not possible to systematically quantify the benchmarks during the pandemic, and we have therefore opted to grade Family and Peers INC for that timeframe.



**Benchmarks:** (1) % of schools with active school policies (e.g., daily PE, daily PA, recess, "everyone plays" approach, bike racks at school, traffic calming on school property, outdoor time). (2) % of schools where the majority ( $\geq$  80%) of students are taught by a PE specialist. (3) % of schools where the majority ( $\geq$  80%) of students are offered the mandated amount of PE (for the given state/territory/region/country). (4) % of schools that offer PA opportunities (excluding PE) to the majority (> 80%) of their students. (5) % of parents who report their children and youth have access to PA opportunities at school in addition to PE classes. (6) % of schools with students who have regular access to facilities and equipment that support PA (e.g., gymnasium, outdoor playgrounds, sporting fields, multi-purpose space for PA, equipment in good condition).

In 2016, the Schools indicator was the highest ranked of all indicators for Slovenia (A), based on the welldeveloped tradition of providing universal, quality PE to children across the country. For example, we reported that although the exact percentage of PE classes taught by a PE specialist vary from grade to grade in early elementary school, by grades 4 to 5, 50% of educators teaching PE are specialists, and from grade 6 through secondary school, 100% of PE classes are taught by PE teachers with a university degree, as decreed by law. Regarding infrastructure, Slovenia is very homogeneous since the national education regulations dictate that every primary school and secondary school must have at least one sports hall (most have 2) which are fully equipped with all the necessary sports equipment, including additional outdoor facilities for the children. All schools in Slovenia have written, public, PA policies (e.g., bike racks at school, traffic calming on school property, outdoor play time). Because the benchmarks above refer to policies enacted by law in Slovenia, the answer to each benchmark is 100%, and thus the Schools indicator was ranked as (A) for the 2018 Report Card as well.

In 2020 during lockdown periods, 69.2% of 11-14-yearold children (N= 1897, 802 boys) reported being active in online PE classes sometimes, often, or always (Kovacs et al, 2020). This is because of intense efforts made by both individual PE teachers to continue their curricula, even when forced to perform lessons remotely, and the education system at Faculty of Sport, which (in coordination with other stakeholders) responded quickly to the pandemic lockdown situation (Morrison et al 2020). Briefly, there were several key initiatives that were enacted the week the Republic of Slovenia declared a pandemic: launched a national campaign #vadidoma, and #trenirajdoma which televised home PA on national public channels, radio promotions, and online platforms; school systems and child health at home were each targeted and engaged with daily for the duration of the most extensive 'lockdown' periods, and children were still required to complete the minimum hours of PA they would normally be receiving in school. Further, Faculty of Sport conducted novel research (using an online questionnaire), to investigate how PE teachers managed distance learning in primary schools across the country. On average, both PE teachers

and students completing their practical pedagogical training, reported that most PE lessons took the form of independent student activity following written or recorded instructions, and the rest took the form of online outdoor or indoor live classes (Markelj et al, 2021). The latter were often used to give instructions, check tasks, and motivate students. Some schools organized at least one sports day (26%), active breaks (21%), or active class breaks (9%). All student teachers delivered physical fitness, followed by athletics (59%), dance and aerobics (43%). However, ball games (except volleyball 33%) were represented in a smaller proportion, with 21% of the students taught content continuously. Assessments was done by 71.4% of the students (many of them assessed only by task completion), and evaluation by only 31.0%. They used a workout diary, videos or photos, or live conference calls. The average student response rate to PE teacher follow-ups were 71% of 1st- 6th graders and 59% of 7th - 9th graders. In conclusion, between the infrastructure laws which remain unchanged, and the concerted efforts of PE teachers nationwide to deliver quality PE instruction to their students in whatever form it took (remote, virtual, in-person learning), we maintained the (A) ranking for this indicator in both epochs.



# Community and A+ Environment

OVERALL GRADE	2018-2020	2020-2021	Data Confidence Score
A+	A+	A+	Long Long Long

**Benchmarks:** (1) % of children or parents who perceive their community/ municipality is doing a good job at promoting PA (e.g., variety, location, cost, quality). (2) % of communities/ municipalities that report they have policies promoting PA. (3) % of communities/ municipalities that report they have infrastructure (e.g., sidewalks, trails, paths, bike lanes) specifically geared toward promoting PA. (4) % of children or parents who report having facilities, programs, parks, and playgrounds available to them in their community. (5) % of children or parents who report living in a safe neighbourhood where they can be physically active. (6) % of children or parents who report having well-maintained facilities, parks and playgrounds that are safe to use.



All municipalities in Slovenia must produce policies promoting PA and publish annual reports on this data, including detailed infrastructure plans. All communities must have open sport facilities, programmes, and playgrounds available for public use. All municipalities in Slovenia are legally obliged to provide co-funding and cooperate with local sports organisations, although the share of public funding contributed to competitive sport and sport for all varies from one municipality to the other. To reflect funding inconsistencies across the country, the Community and Environment indicator was first graded with a (B) score in the 2018 Report Card. However, if we are strictly grading on the current benchmarks listed above, then for benchmarks #2 and #3, the answer continues to be 100% (A+). Because of this, data for benchmark #4 is non-existent/not applicable for Slovenia. Data from ACDSi study indicate that when 11- to 14-year-olds were asked why they don't walk to school, only 10% considered it unsafe to do so (i.e., benchmark #5 = 90%, A). Benchmarks #1 and #6 are related to parent and child perceptions to promotion of PA in the community, and the maintenance/quality of the facilities provided. Slovenia does not have perception data in this regard.

These infrastructure metrics did not change in 2020 due to the pandemic *per se*. What did change was access to community infrastructure, especially when the first wave lockdown measures were initiated. At that time, all outdoor public spaces in urban dwelling areas (but not beaches or national parks, only playgrounds, sports halls, and running tracks, for example) were closed/prohibited to visit by the public. Empirical data on the long-term deterring effect of these intermittent closure policies on child PA is not currently known, but informal evidence was queried using questionnaires released on the expert moderated SLOfit Facebook page. Results were published in a report online (Potočnik et al, 2020b). When parents were asked to help SLOfit assess the situation on children's playgrounds, N=75 individuals responded to the initiative (**Figure 3**).

When considering grading this indicator, we reflected on the instructions from AHKGA which clearly state that we must be strict to the criteria we have evidence for. With this in mind, we have very clear evidence that Slovenia is meeting the demands of the community and environment in terms of safe, accessible infrastructure for children, youth, and all to access and use, usually free-of-charge. Although the community was greatly affected by the pandemic movement restrictions, this was not due to this indicator, and more an issue of government policy decision making (see: Government, below), and we have therefore graded Community and Environment with an A rating for both time epochs. Since the data for this indicator is readily accessible through official public government documents, we have confidence in its veracity. We removed one sneaker of data confidence based on the fact any parent-child data gathered in the past has relied on subjective selfassessment.



- The playground is closed.
- There are **very few** children on the playgrounds compared to normal days.
- There are **few** children on the playgrounds compared to normal days.
- There are **as many** children on the playgrounds as on normal days.
- There are **more** children are on the playgrounds than on normal days.
- There are **many more** children on the playgrounds than on normal days.

**Figure 3.** When asked to describe the situation on the playground from the week of 02 Feb, 2020, parents responded with feedback that 36% of playgrounds in their neighbourhood were closed, 24% responded there were very few children and 13.3% said there were fewer children on the playground, for a total of 73.3% of parents noticing significant declines in child outdoor play in the community.

OVERALL GRADE	2018-2020	2020-2021	Data Confidence Score
D	Α	F	

**Benchmarks:** (1) Evidence of leadership and commitment in providing PA opportunities for all children and youth. (2) Allocated funds and resources for the implementation of PA promotion strategies and initiatives for all children and youth. (3) Demonstrated progress through the key stages of public policy making (i.e., policy agenda, policy formation, policy implementation, policy evaluation and decisions about the future).

In 2016, The Government indicator was ranked with a (B+), since the Slovenian Parliament had recently adopted a National Program of Sport running from 2014–2023. One year later it also adopted a National Program of Nutrition and Physical Activity for Health for 2015–2025. Thus, for the first time in the history of an independent Slovenia, there were programmes dedicated to coordinating the efforts of public health, sport, and the educational sector, emphasizing PA, along with nutrition, as key factors in achieving public health goals. Trends for solid government investment remained high as of 2018, with Slovenia's second report card based on its strong support for investing in child PA, by transforming a previously successful Healthy Lifestyle intervention programme into an experimental programme, which aimed to be initiated on 155 primary schools. Its goal: to introduce additional support for child PA in all primary schools after 3 years so that all children would reach 60 minutes of MVPA daily within their school system alone. The government also introduced a "Youth for Youth" sports programme in secondary schools in 2018 to boost PA also in the adolescent population. Based on these initiatives, Government was graded (A) in 2018, and this ongoing, committed support is reflected through our current 2018-2020 reporting period.

Unfortunately, the global pandemic, and more specifically, the Slovenian Government response to the global pandemic in terms of policy decisions related to providing PA opportunities, allocated funds and resources, and progress through decision making processes, was disastrous for child PA overall. Despite aggressive campaigns to maintain PA at home, the country experienced tremendous decreases in child fitness (see: Fitness Indicator) as self-isolation measures were mandated by national authorities, prompting researchers to create a method to track and communicate government decisions with direct impact on child PA, fitness, and overall health to the public (i.e., the SLOfit Barometer, Jurak et al, 2020). Moreover, leisure sport programmes for children and youth received 38% less money in 2021 in comparison to 2020. Also, funding for competitive sport of children and youth went down by 13%. At the same time, the Ministry failed to assure the continuation of the highly successful Healthy Lifestyle project after the year 2018. The government did implement a so-called "Extended programme" which aimed to also provide some additional PE hours within the school system. However, there are very few publicly available data about this 3-year experimental programme; what is known is that there were no consultations held between intervention experts, the programme was no longer delivered by actual PE teachers but by any teacher (even chemistry teachers) who lacked hours to full employment, and the number of children in the exercise group was no longer following the PE normative of maximum of 28 children per class. These changes have made the new experimental programme terribly ineffective in terms of maintaining or improving child physical activity and fitness compared to Healthy Lifestyle. For context, The Republic of Slovenia has been experiencing the greatest slide in its democratic index amongst the Eastern Europe and Central Asian region, due in part to the fact that a fragmented, center-left ruling coalition was kept together only by polarized relations with the political right, significantly hampering the country's governance (https:// freedomhouse.org/sites/default/files/2022-04/ NIT 2022 final digital.pdf).

The administration that was in power from 2018 to 2022, sidelined the parliament and exerted considerable political and financial pressure on civil society organizations, public media services, the judiciary, and the European Public Prosecutor's Office, for example. Therefore it is not a surprise that funding, intellectual infrastructure, and leadership commitment to encouraging implementation of PA strategies for children would also be negatively affected during these years.

## Sleep

**D**-

OVERALL GRADE	2018-2020	2020-2021	Data Confidence Score
D-	D-	INC	

**Benchmark:** % of children who meet international AASM (American Association of Sleep Medicine) standards for nocturnal sleep duration for their age category.



Sleep was included as an indicator for the first time in the 2018 Report Card. The data were retrieved from self-reported questions from the ACDSi database, which found that less than 40% of children between 11 and 18 years were meeting sleep recommendations during school days, but on weekends, 77% of boys and 87% of girls did meet recommendations. The indicator was graded (D) to reflect the greater number of days of the week when children and youth were not meeting these standards.

Novel 24-HMB data are being collected as part of numerous ongoing national and international initiatives, however these results are not ready in time for this Report Card. There is 2018 data from the ongoing HBSC study which found that in students 11, 13, 15, and 17-years-old, just over a fifth (22.1%) of adolescents sleep nine hours or more per night during the school week in accordance with sleep recommendations (D-). For example, amongst 11-yearolds, more than half (54.2%) reported sleeping 9 or more hours per night, but this continued to drop precipitously as children age, from 25.6% (13 y), to 2.6% (15 y) and 2.0% (17 y) (Jeriček Klanšček et al, 2019). More recently, sleep duration data was selfassessed in N=62 schoolchildren before and during the first wave lockdown period from March-May, 2020 (Morrison et al 2021). These data found greater variability in sleep patterns, with some children reporting far less, and others reporting far more nocturnal sleep durations. The number of children meeting international recommendations was not reported. Future work on objectively measured 24-HMB will hopefully shed greater light on the current state of sleep patterns in children. The authors of this Report Card would like to emphasize that increases in screen time (e.g., remote learning), sedentary behaviours, and less emphasis on outdoor family activities may affect sleep quality of both children and adults, especially since correlations from other nations have observed that increases in these habits reduced overall sleep hours, resulting in poorer quality sleep overall. General tips for good sleep hygiene include going to bed and wake up at the same time every night, avoiding caffeine intake, not going to bed feeling hungry, and reserving your bedroom for sleeping only (e.g., no electronic devices!)

# Seasonal D+ Variations

OVERALL GRADE	2018-2020	2020-2021	Data Confidence Score
D+	D	C-	Long Long

**Benchmarks:** (1) % of children who remain consistently physically active throughout the year, i.e., for daily PA deviations greater than 5% between calendar months by season, one letter grade will be reduced or advanced accordingly. (2) % of children who report greater sedentary behaviours within a given season compared to other months of the year and can be attributed to weather events or seasonal variations in weather (e.g., heatwaves, polar vortex, midnight sun, etc.).

The Republic of Slovenia is a small, alpine, central European nation within the European Union with a diverse topography and climates, ranging from Mediterranean to the mountainous regions of the Julian Alps in the north, to flat agricultural lands to the east. It therefore experiences a wide range of weather patterns throughout the year. We know that daily maximum temperatures are significantly associated with MVPA and sedentary time from cross-sectional work on 9-11-yearold children from Australia (N= 491) and Canada (N= 524, Lewis et al, 2016); that children's thermoregulation physiology differs to fully mature adults (Notley et al, 2020), and that when children freely play outdoors, their MVPA is associated with pronounced elevations in heat strain (McGarr et al, 2020).

Anecdotal evidence comparing data from the ACDSi study (sampled in September) and the SLOfit database (sampled annually in April) suggest fitness trends in children are negatively affected by summer holidays, likely because out-of-school periods affect children's overall PA; Slovenian children receive well-structured PA regularly as part of societal structures (see: Schools, Community, and Government indicators), but far less is known about spontaneous play (see: Active Play indicator) and times when children's PA are left to the interest and motivation of their parents. This year, data were published by Volmut and colleagues (2021) who compared accelerometer-based PA patterns in N=93 6- to 9-year-olds, assessed four times: before (May/June 2010), during (August), and after (September) summer holidays. Their work included a 1-year follow up (May/June 2011). During summer holidays overall PA decreased by 18% (p < 0.001), physical inactivity increased by 5.5% (p < 0.001), moderate PA decreased by 53% (p < 0.001) and moderate to vigorous PA decreased by 45% (p < 0.001) when compared to before summer holidays.

More recently, a pilot study by Ravanelli and colleagues (2021) was conducted which evaluated 24-hour movement behaviour, thermal perception and thirst in children and adults on days when a local heat alert was broadcast. To date, 25 adults (40±10 y; 13 female) and 12 children (6±2 y; 6 female) from Canada and Slovenia completed online questionnaires during heat waves from June–July 2021. On heat alert days (maximum ambient temperature: 30.2±1.5°C [Range: 26.7°C–33.54°C]), children engaged in significantly more moderate (children: 107±90 mins, adults: 56±53 min) and vigorous (children: 62±46 min, adults: 19±33 min) PA compared to adults and spent less time engaging in sedentary activities (children: 40±98 min, adults: 113±138 min). Despite higher activity levels, thermal sensation, and thermal comfort where not different between groups. Interestingly, children report higher thirst sensation throughout the day compared to adults, which may dispose them to an increased risk for exertional heat illness compared to their adult counterparts.

The PA and fitness data collected from these studies used objective and subjective measures, but the size of the samples and the regional nature of both research items warranted only 2 data confidence sneakers. Future work should investigate to what extent heatwaves play a role in child and adult PA patterns; to what extent children may perceive heat differently than adults, and formulating countermeasures to exertional heat strain, dehydration risk, and heat acclimation, especially for young people.



### **Additional Resources**



SLOfit is a national surveillance system for physical and motor development of children and youth which was formerly known as Sports Educational Chart. The system was implemented in 1982 on a sample of Slovenian schools and after 5 years of testing it was introduced to all Slovenian primary and secondary schools. en.slofit.org



Active Healthy Kids Slovenia- AHKS was established by Dr. Shawnda Morrison in 2015 as part of the initial invitation to join the Global Matrix 2.0. The organisation includes medical doctors, epidemiologists, urban planners, school administrators, academics, graduate students, and psychologists. The organisation will continue to grow to support the ever-growing needs of ensuring all children have access to high-quality physical activity in Slovenia.

en.slofit.org/research/activehealthykids





National Institute for Public Health www.nijz.si/en

The Slovenian Olympic Committee

stara.olympic.si/en



Outdoor Education Schools www.csod.si/?language=en



Slovenian Ministry of Education, Science, and Sport www.gov.si/en/state-authorities/ministries/ministry-of-education-science-and-sport



List of Government Degrees "Uradni List" is a special feature of the Republic of Slovenia, where every law that is decreed must be made publicly available. This portal is available to all for searching purposes, and any government regulation at the national level must be published here. Data on specific items like school infrastructure, public parks, or number of sidewalk/walkways in the community can be searched here. www.uradni-list.si

### **Data Sources and References**

### **PEER-REVIEWED PUBLICATIONS**

- Jeriček Klanšček, Helena (author, editor), ROŠKAR, Maja (author, editor), DREV, Andreja (author, editor), PUCELJ, Vesna, KOPRIVNIKAR, Helena, ZUPANIČ, Tina (author, editor), KOROŠEC, Aleš, PRELEC POLJANŠEK, Pia (editor). Z zdravjem povezana vedenja v šolskem obdobju med mladostniki v Sloveniji : izsledki mednarodne raziskave HBSC, 2018. Elektronska izd. Ljubljana: Nacionalni inštitut za javno zdravje, 2019. ISBN 978-961-7002-85-0. https://www.nijz.si/sites/www.nijz.si/files/publikacije-datoteke/hbsc\_2019\_e\_verzija\_obl.pdf.
- Jurak G, Kovač M, Starc G. The ACDSi 2013 The Analysis of Children's Development in Slovenia 2013: Study protocol. Anthropological Notebooks. 2013;19(3):123-43.
- JURAK, Gregor, MORRISON, Shawnda A., LESKOŠEK, Bojan, KOVAČ, Marjeta, HADŽIĆ, Vedran, VODIČAR, Janez, TRUDEN-DOBRIN, Polonca, STARC, Gregor. Physical activity recommendations during the COVID-19 virus outbreak. Journal of sport and health science. Jul. 2020, vol. 9, no. 4, str. 325-327. DOI: 10.1016/j. jshs.2020.05.003.
- Jurak G, Morrison SA, Kovač M, Leskošek B, Sember V, Strel J, Starc G. A COVID-19 Crisis in Child Physical Fitness: Creating a Barometric Tool of Public Health Engagement for the Republic of Slovenia. Front Public Health. 2021 Mar 5;9:644235. doi: 10.3389/fpubh.2021.644235. PMID: 33748071; PMCID: PMC7973087.
- Jurak G, Soric M, Sember V, Djuric S, Starc G, Kovac M, Leskosek B. Associations of mode and distance of commuting to school with cardiorespiratory fitness in Slovenian schoolchildren: a nationwide cross-sectional study. BMC Public Health. 2021 Feb 4;21(1):291. doi: 10.1186/s12889-021-10326-6. PMID: 33541296; PMCID: PMC7863324.
- JURAK, Gregor, LESKOŠEK, Bojan, KOVAČ, Marjeta, SORIĆ, Maroje, KRAMARŠIČ, Jaka, SEMBER, Vedrana, DURIĆ, Saša, MEH, Kaja, MORRISON, Shawnda A., STREL, Janko, STARC, Gregor. SLOfit surveillance system of somatic and motor development of children and adolescents: upgrading the Slovenian Sports Educational Chart. Acta Universitatis Carolinae. Kinanthropologica. 2020, vol. 56, no. 1, str. 28-40, ilustr. ISSN 1212-1428. DOI: 10.14712/23366052.2020.4. https://karolinum.cz/data/clanek/8064/Kinan\_56\_1\_0028.pdf
- Kovacs VA, Starc G, Brandes M, Kaj M, Blagus R, Leskošek B, Suesse T, Dinya E, Guinhouya BC, Zito V, Rocha PM, Gonzalez BP, Kontsevaya A, Brzezinski M, Bidiugan R, Kiraly A, Csányi T, Okely AD. Physical activity, screen time and the COVID-19 school closures in Europe - An observational study in 10 countries. Eur J Sport Sci. 2021 Mar 29:1-10. doi: 10.1080/17461391.2021.1897166. Epub ahead of print. PMID: 33641633.
- Lewis LK, Maher C, Belanger K, Tremblay M, Chaput JP, Olds T. At the Mercy of the Gods: Associations Between Weather, Physical Activity, and Sedentary Time in Children. Pediatr Exerc Sci. 2016 Feb;28(1):152-63. doi: 10.1123/ pes.2015-0076.

- Lobe, B., Velicu, A., Staksrud, E., Chaudron, S. and Di Gioia, R. (2020), How children (10-18) experienced online risks during the Covid-19 lockdown - Spring 2020, EUR 30584 EN, Publications Office of the European Union, Luxembourg, 2021, ISBN 978-92-76-29763-5, doi:10.2760/562534, JRC124034.
- MARKELJ, Neja, POTOČNIK, Žan Luca, JURAK, Gregor, KOVAČ, Marjeta. The quality of pre-service teacher training during the pandemic through the eyes of the Slovenian physical education pre-service teachers. Collegium antropologicum. 2021, no. 3, str. 179–189. DOI: 10.5671/ca.45.3.1.
- McGarr GW, Saci S, King KE, Topshee S, Richards BJ, Gemae MR, McCourt ER, Kenny GP. Heat strain in children during unstructured outdoor physical activity in a continental summer climate. Temperature (Austin). 2020 Aug 12;8(1):80-89. doi: 10.1080/23328940.2020.1801120.
- 12. MEH, Kaja, MORRISON, Shawnda A., SEMBER, Vedrana, JURAK, Gregor. Spremembe v 24-urnem gibalnem vedenju slovenskih najstnikov v času izolacijskih ukrepov ob prvem valu epidemije COVID-19. Šport: revija za teoretična in praktična vprašanja športa. 2021, letn. 69, št. 1/2, str. 251-256.
- Moore, S.A., Faulkner, G., Rhodes, R.E. et al. Impact of the COVID-19 virus outbreak on movement and play behaviours of Canadian children and youth: a national survey. Int J Behav Nutr Phys Act 17, 85 (2020). https://doi. org/10.1186/s12966-020-00987-8.
- 14. Morrison SA, Meh K, Sember V, Starc G, Jurak G. The Effect of Pandemic Movement Restriction Policies on Children's Physical Fitness, Activity, Screen Time, and Sleep. Front Public Health. 2021a Dec 6;9:785679. doi:10.3389/fpubh.2021.785679.
- MORRISON, Shawnda A., SEMBER, Vedrana, LESKOŠEK, Bojan, KOVAČ, Marjeta, JURAK, Gregor, STARC, Gregor. Assessment of secular trends and health risk in paediatric cardiorespiratory fitness from the Republic of Slovenia. Frontiers in physiology. 2021b, vol. 12, art. 644781, 8 str., DOI: 10.3389/fphys.2021.644781.
- MORRISON, Shawnda A., JURAK, Gregor, STARC, Gregor. Responding to a global pandemic: Republic of Slovenia on maintaining physical activity during self-isolation. Scandinavian journal of medicine & science in sports. August 2020, vol. 30, iss. 8, str. 1546-1548, DOI: 10.1111/sms.13745.
- MORRISON, Shawnda A., PÉRIARD, Julien D., DE BOEVER, Patrick, DAANEN, Hein A. M. The effects of climate change and environmental factors on exercising children and youth: editorial. Frontiers in sports and active living. May 2021c, vol. 3, art. 690171, str. 1-3, ilustr. ISSN 2624-9367. https://www.frontiersin.org/articles/10.3389/ fspor.2021.690171/full, DOI: 10.3389/fspor.2021.690171.
- 18. MORRISON, Shawnda A. Sleep quality and health in Slovenian schoolchildren= Kakovost spanja in zdravje slovenskih šolarjev. Physis: journal for physical culture and rehabilitation. 2020, vol. 1, no. 1, str. 43-46. ISSN 2738-5124.
- Notley SR, Akerman AP, Meade RD, McGarr GW, Kenny GP. Exercise Thermoregulation in Prepubertal Children: A Brief Methodological Review. Med Sci Sports Exerc. 2020 Nov;52(11):2412-2422. doi: 10.1249/ MSS.00000000002391
- Popkin, B. M., Adair, L. S., & Ng, S. W. (2012). Global nutrition transition and the pandemic of obesity in developing countries. Nutrition reviews, 70(1), 3-21. doi:10.1111/j.1753-4887.2011.00456.x
- 21. Popovic S, Starc G, Soric M, Jarani J. Editorial: Children's Development During Social Transition. Front Public

Health. 2021 Nov 10;9:794444. doi: 10.3389/fpubh.2021.794444. PMID: 34858939; PMCID: PMC8631295.

- 22. Potočnik ŽL, Jurak G, Starc G. Secular Trends of Physical Fitness in Twenty-Five Birth Cohorts of Slovenian Children: A Population-Based Study. Front Public Health. 2020a Oct 19;8:561273. doi: 10.3389/fpubh.2020.561273
- 23. POTOČNIK, Žan Luca, MEH, Kaja, KOVAČ, Marjeta, STARC, Gregor, LESKOŠEK, Bojan, JURAK, Gregor. Dejavnosti raziskovalne skupine SLOfit med epidemijo COVID-19. Šport : revija za teoretična in praktična vprašanja športa. 2021, letn. 69, št. 1/2, str. 241-250
- RAVANELLI, Nicholas, MORRIS, Nathan B., MORRISON, Shawnda A. Effect of heat waves on 24-hour movement behaviour, thermal perception, and thirst in children and adults: a pilot study. In: Proceedings of the Canadian Society for Exercise Physiology Annual General Meeting – Zooming into the Future: Exercise Science in the Virtual Age, Virtual – October 13–16, 2021. Ottawa: Canadian Society for Exercise Physiology, 2021. Str. 71. Applied physiology, nutrition, and metabolism, Vol. 46, no. 10 (suppl. 2), 2021. ISSN 1715-5320. DOI: 10.1139/apnm-2021-0562.
- Ruiz, J., Cavero-Redondo, I., Ortega, F., Welk, G., Andersen, L., and Martinez-Vizcaino, V. (2016). Cardiorespiratory fitness cut points to avoid cardiovasculardisease risk in children and adolescents; what level of fitness should raise a redflag? A systematic review and meta-analysis. Br. J. Sports Med. 50, 1451–1458.doi: 10.1136/bjsports-2015-095903.
- 26. SEMBER, Vedrana, KOVAČ, Marjeta, STARC, Gregor, MORRISON, Shawnda A., JURAK, Gregor. Ali smo lahko zaskrbljeni zaradi zmanjšanja telesne dejavnosti naših otrok v zadnjem vzgojno-izobraževalnem obdobju? Šport: revija za teoretična in praktična vprašanja športa. 2019, letn. 67, št. 3/4, str. 38-44, ilustr. ISSN 0353-7455.
- 27. SEMBER, Vedrana, MORRISON, Shawnda A., JURAK, Gregor, KOVAČ, Marjeta, STARC, Gregor. Differences in physical activity and academic performance between urban and rural schoolchildren in Slovenia. Montenegrin Journal of Sports Science and Medicine. March 2018, letn. 7, št. 1, str. 67-72, DOI: 10.26773/mjssm.180309.
- Sorić M, Jurak G, Đurić S, Kovač M, Strel J, Starc G. Increasing trends in childhood overweight have mostly reversed: 30 years of continuous surveillance of Slovenian youth. Sci Rep. 2020 Jul 3;10(1):11022. doi: 10.1038/ s41598-020-68102-2.
- 29. Starc G, Kovač M, Strel J, et al. The ACDSi 2014 a decennial study on adolescents' somatic, motor, psychosocial development and healthy lifestyle: Study protocol. Anthropological Notebooks.2015;21(3):107-123.
- Tomkinson, G. R., Carver, K. D., Atkinson, F., Daniell, N. D., Lewis, L. K., Fitzgerald, J. S., Lang, J. J., & Ortega, F. B. (2018). European normative values for physical fitness in children and adolescents aged 9-17 years: results from 2 779 165 Eurofit performances representing 30 countries. British journal of sports medicine, 52(22), 1445– 14563. https://doi.org/10.1136/bjsports-2017-098253.
- 31. Volmut T, Dolenc P, Šimunič B. Physical activity drop after long summer holidays in 5- to 8-year-old children. In: Exercise and Quality of life 2008. Novi Sad: Faculty of Sport and Physical Education Novi Sad; 2008:75–82.
- 32. Volmut T, Pišot R, Planinšec J, Šimunič B. Physical Activity Drops During Summer Holidays for 6- to 9-Year-Old Children. Front Public Health. 2021 Jan 18;8:631141. doi: 10.3389/fpubh.2020.631141.
- 33. Zovko V, Djuric S, Sember V, Jurak G. Are Family Physical Activity Habits Passed on to Their Children? Front Psychol. 2021 Sep 6;12:741735. doi: 10.3389/fpsyg.2021.741735.

#### Slovenian Federal Government public record journal of laws and decrees

https://www.uradni-list.si/ Republic of Slovenia. Zakon o športu (ZŠpo-1). Ur I RS, št. 2017(29):4713.

#### Non-governmental organisation reports and regulations

WHO. (2014). Physical status: the use and interpretation of anthropometry: report of a WHO Expert Committee.
Geneva; 1995. WHO technical report series, 854.
ZSRS. 2017; https://www.zsrs-planica.si/zdrav-zivljenjski-slog/. Accessed 25 June, 2018
Freedom House (Democracy Index) https://freedomhouse.org/sites/default/files/2022-04/NIT\_2022\_final\_digital.pdf

#### AJPES- The Agency of the Republic of Slovenia for public law records and services

https://www.ajpes.si/Doc/LP/Informacije/Informacija\_LP\_drustva\_2018.pdf https://www.ajpes.si/Doc/LP/Informacije/Informacija\_LP\_drustva\_2019.pdf

#### **Slovenian Ministry of Internal Affairs**

http://mrrsp.gov.si/rdruobjave/dr/index.faces

#### **Ministry of Education, Science and Sport**

https://www.gov.si/teme/letni-program-sporta-v-republiki-sloveniji/ https://www.gov.si/assets/ministrstva/MIZS/Dokumenti/Direktorat-za-sport/LPS-2020/sredstva\_LPS\_2020.pdf https://www.gov.si/assets/ministrstva/MIZS/Dokumenti/Direktorat-za-sport/LPS-2021/Sredstva-za-leto-2021.pdf http://osrace1516.splet.arnes.si/files/2018/11/sklep\_o\_uvedbi\_poskusa.pdf

### Ministry of Health and Ministry of Infrastructure Inštitut za politike prostora (Institute for Spatial Policy) Active Transport Initiatives

https://www.aktivnovsolo.si/pesbus/

### SLOFIT ANNUAL REPORTS, PROFESSIONAL ARTICLES, BOOK CHAPTERS OR ARTICLES PUBLISHED ONLINE

GOLOBIČ, Mojca, LESTAN, Katarina Ana, ČERNIČ MALI, Barbara, JURAK, Gregor, SEMBER, Vedrana, KOVAČ, Marjeta, STARC, Gregor. Metlika : Pomen odprtega urbanega prostora za zdravo odraščanje in aktivno staranje : raziskava na primeru šestih šolskih okolišev v Sloveniji. Ljubljana: Univerza v Ljubljani: Urbanistični inštitut Republike Slovenije, [2019]. 25 str., ilustr. http://www.bf.uni-lj.si/index. php?eID=dumpFile&t=f&f=41850&token=02fbc9c623c216d44455d2424d0aa3db5a3cf21e.

JURAK, Gregor, STARC, Gregor, KOVAČ, Marjeta. Physical education and school sport in Slovenia. In: NAUL, Roland (ed.), SCHEUER, Claude (ed.). Research on physical education and school sport in Europe. Aachen: Meyer & Meyer, cop. 2020. Str. 471-492, ilustr. Edition Schulsport, Bn. 38. ISBN 978-3-8403-7539-2, ISBN 3-8403-7539-8.

KOVAČ, Marjeta, JURAK, Gregor, STARC, Gregor. Slovenia: physical education teacher education in Slovenia. In: MACPHAIL, Ann (ed.), TANNEHILL, Deborah (ed.), AVSAR, Zuleyha (ed.). European physical education teacher education practices : initial, induction, and professional development. Maidenhead: Meyer & Meyer Sport, 2019. Str. 342-359, ilustr. ISBN 978-1-78255-177-5, ISBN 1-78255-177-8.

POTOČNIK, Žan Luca, MEH, Kaja, JURAK, Gregor. Skrbniki otroških in športnih igrišč, omogočite dostop do igrišč!. SLOfit nasvet. 2. nov. 2020b, ilustr. ISSN 2591-2410. http://www.slofit.org/slofit-nasvet/ArticleID/224/Skrbnikiotro%C5%A1kih-in-%C5%A1portnih-igri%C5%A1%C4%8D-omogo%C4%8Dite-dostop-do-igri%C5%A1%C4%8D, http://www.slofit.org/slofit-nasvet, Accessed: 01.02.2022.



en.slofit.org/research/activehealthykids