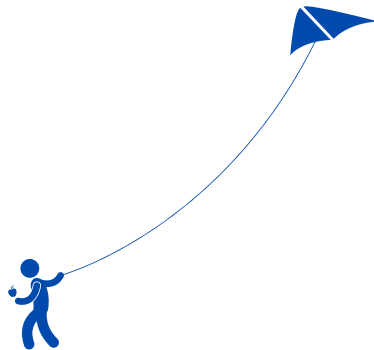




2021 Active Healthy Kids Scotland Report Card



2021 Scotland Report Card

ACKNOWLEDGEMENTS

The 2021 Active Healthy Kids Scotland Report Card is a 'state of the nation' report on the physical activity and health of Scottish children and adolescents, prior to the Covid-19 pandemic.

The report card was produced by the University of Strathclyde (Prof John J Reilly; Dr Farid Bardid), University of Aberdeen (Dr Leone Craig), Robert Gordon University (Jenni Robertson), MRC/CSO Social and Public Health Sciences Unit, University of Glasgow (Dr Avril Johnstone) and University of Stirling (Dr Simone Tomaz). The draft grades were reviewed by stakeholders from a range of sectors within Scotland and the Active Healthy Kids Global Alliance.

No funding was received for the 2021 Report Card.



MRC/CSO Social and Public Health Sciences Unit



Medical
Research
Council



CHIEF
SCIENTIST
OFFICE



University
of Glasgow



1495
UNIVERSITY OF
ABERDEEN

UNIVERSITY of
STIRLING



CONTACT DETAILS

Professor John Reilly (john.j.reilly@strath.ac.uk; Physical Activity for Health Group, School of Psychological Sciences & Health, University of Strathclyde, Glasgow), and

Dr Farid Bardid (farid.bardid@strath.ac.uk; School of Education, University of Strathclyde, Glasgow)



Results of the 2021 Active Healthy Kids Scotland Report Card:

SUMMARY OF PUBLISHED DATA SOURCES AND GRADES

This document provides detailed information on the indicators and benchmarks, all the data sources used to grade the indicators, why and how they were used, and a summary of the findings. Scottish data and proposed grades are explained.

In summary,

- We searched for published evidence/data sources from end 2018 onwards (this is when we stopped searching for data sources for the 2018 report card).
- We excluded data obtained during the Covid-19 pandemic and policy documents detailing responses to Covid-19 were not considered. A future report card will consider the impact of lockdown on the grades (in some other countries Covid-19 has had a devastating impact on a number of the indicators, e.g., drastic declines in physical fitness). The aim is to produce a post-Covid report card towards the end of 2023, should there be sufficient data.
- To be used for grading, data needed to be recent (end 2018 onwards), nationally representative, and affected by minimal bias (i.e. the method used to measure the indicator does not greatly overestimate or under-estimate the prevalence of the behaviour). Available data are critiqued by the report card working group in order to assess representativeness and risk of bias, and the draft grades went through an online consultation process with stakeholders (summarised separately).
- Grading for the Scottish report card is based on data from children and adolescents aged 2 to 18 years and inequalities/differences considered by age, gender, socio-economic deprivation, ethnicity, chronic disease and disability where possible. Grades for the Active Healthy Kids Global Alliance Global Matrix 4.0 are based on school-age children and adolescents, though in practice there was no meaningful difference between grades used for the Scottish card and the global matrix.

For further information/background on methodology (including data sources which could not be used and the reasons for that), please refer to information from the Active Healthy Kids Global Alliance (AHKGA; www.activehealthykids.org) and previous Active Healthy Kids Scotland Report Cards and publications (2013, 2016, 2018) available at <https://www.activehealthykidsscotland.co.uk/>.

An international report card consisting of report cards from ±60 countries, including Scotland, will be published by the AHKGA towards the end of 2022.

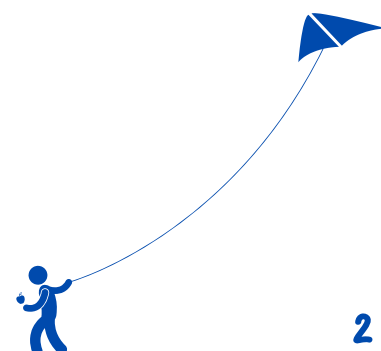


The grades were determined by the % of children and adolescents meeting an evidence-based benchmark (see below) using the grading scheme below.

- **A+** = 94%-100%
- **A** = We are succeeding with a large majority of children (87%-93%)
- **A-** = 80%-86%
- **B+** = 74%-79%
- **B** = We are succeeding with well over half of children (67%-73%)
- **B-** = 60%-66%
- **C+** = 54%-59%
- **C** = We are succeeding with about half of children (47%-53%)
- **C-** = 40%-46%
- **D+** = 34%-39%
- **D** = We are succeeding with less than half of children (27%-33%)
- **D-** = 20%-26%
- **F** = We are succeeding with very few of children (<20%)
- **INC** = Incomplete Grade, where Scottish data were not available or were insufficient/ inadequate to assign a grade

SUMMARY OF INDICATORS: SCOTLAND REPORT CARD

Indicator	Definition
Sedentary Behaviors	Any waking behaviour characterized by an energy expenditure ≤ 1.5 metabolic equivalents, while in a sitting, reclining or lying posture.
Overall Physical Activity	Any bodily movement produced by skeletal muscles that requires energy expenditure
Organized Sport and Physical Activity	A subset of physical activity that is structured, goal-oriented and competitive.
Active Play	Active play may involve symbolic activity or games with or without clearly defined rules; the activity may be unstructured/ unorganized, social/ solitary, but the distinguishing features are a playful context, combined with activity that is significantly above resting metabolic rate. Active play tends to occur sporadically, with frequent rest periods, which makes it difficult to record.



Indicator	Definition
Active Transportation	Active transportation refers to any form of human-powered transportation – walking, cycling, using a wheelchair, in-line skating or skateboarding.
Physical Fitness	Characteristics that permit a good performance of a given physical task in a specified physical, social, and psychological environment.
Diet *	% of children and adolescents consuming at least 5 portions of fruit and vegetables a day, % of children and adolescents meeting the Scottish Dietary Goals (SDGs) which were revised in 2016 (e.g. average intake of free sugars should not exceed 5% of total energy intake in children over 2 years, average intake in saturated fat should not exceed 11% of food energy intake (often equivalent to total energy in children)
Obesity *	% (prevalence) of obesity in children and adolescents. Ideally, prevalence of obesity should be estimated based on body fatness measures but in Scotland, as in most countries, body fatness is not measured and a simpler proxy Body Mass Index (BMI), is used. In children and adolescents BMI should be expressed as an age and sex specific centile or SD score relative to reference or standard data. In Scotland, for school-age children up to 18 years of age the UK 1990 reference data is used, for children aged under 5 years the WHO growth standards should be used.
Family and Peers	Any member within the family who can control or influence the physical activity opportunities and participation of children and youth in this environment.
Community and Environment	Any policies or organizational factors (e.g., infrastructure, accountability for policy implementation) in the municipal environment that can influence the physical activity opportunities and participation of children and youth in this environment.
Government	Any governmental body with authority to influence physical activity opportunities or participation of children and youth through policy, legislation or regulation.

**The Diet and Obesity indicators are not Global Matrix Indicators.*

Note for AHKGA Global Matrix 4.0: There is no grade for the AHKGA School Indicator in Scotland (see Active Healthy Kids Scotland Report Card 2013 and related publications). The definition of the School indicator is: Any policies, organizational factors (e.g., infrastructure, accountability for policy implementation) or student factors (e.g., physical activity options based on age, gender or ethnicity) in the school environment that can influence the physical activity opportunities and participation of children and youth in this environment.





2021 Scotland Report Card

GRADES SUMMARY AND EVIDENCE OF INEQUALITIES IN GRADES

Indicator	Grade	Summary of inequalities identified
Sedentary Behaviours	F We are succeeding with very few of children (<20%)	Screen time much higher in the more socio-economically deprived individuals, and slightly higher in boys than girls.
Overall Physical Activity	INC Insufficient evidence to grade	Unlikely for socioeconomic deprivation; girls slightly less likely to meet guidelines than boys.
Organised Sport and Physical Activity	B- We are succeeding with well over half of children (60-66%)	Reported participation lower in more socio-economically deprived individuals; no marked differences between boys and girls.
Active Play	INC Insufficient evidence to grade	Reported participation in active play slightly lower in girls than boys.
Active Transportation	C- We are succeeding with about half of children (40-46%)	Active commuting to school via cycling lower in more socio-economically deprived individuals.
Physical Fitness	INC Insufficient evidence to grade	INC
Diet	INC Insufficient evidence to grade	Markedly poorer diet in the more socio-economically deprived individuals.
Obesity	INC Insufficient evidence to grade	Markedly higher prevalence of obesity in the more socio-economically deprived individuals, and socio-economic gap in obesity risk by primary 1 is widening substantially with time.
Family and Peers	D- We are succeeding with less than half of children (20-26%)	Family and peer diet, obesity, participation in sport and physical activity, volunteering in sport and physical activity all less favourable in the more socio-economically deprived individuals.
Community and Environment	B- We are succeeding with well over half of children (60-66%)	Perceived safety lower in more socio-economically deprived neighbourhoods.
Government	C We are succeeding with about half of children (47-53%) C+ We are succeeding with about half of children (54-59%)	(Physical activity policy) (Diet policy)



Sedentary Behaviours



Benchmark:

% of children and youth who meet the evidence-based guidelines from the Canadian Society for Exercise Physiology (2016). The guidelines currently provide a time limit recommendation for screen-related sedentary pursuits, but not for non-screen-related sedentary pursuits.

Grading Summary:

The best data available are for adolescents only (11, 13, and 15 year olds, from HBSC), and these data fit the international benchmark. The time spent in the different forms of screen time are at least partly additive and suggest that by early-adolescence almost all Scots adolescents greatly exceed 3 hours/day recreational screen time (1 hour more than the recommendation). Based on these data (with increases in reported screen time over successive surveys, and the likelihood that 2018 HBSC weekday data underestimate total screen time) an **F** grade was assigned. Moreover, the HBSC (Health Behaviour in School-aged Children) data also suggest that recreational screen time is strongly socially patterned (higher in adolescents from more deprived families), and slightly higher in boys than girls. There is also a good deal of evidence (including from previous HBSC Scotland reports) that screen time is significantly higher on weekends and school holidays (unstructured days, almost half of all days during the year), so these screen-time estimates from HBSC 2018 are likely to be conservative:

Summary of TV Viewing (% of sample exceeding 2 hours/weekday):

- Boys: 11y 69%; 13y 70%; 15y 73%.
- Girls: 11y 60%; 13y 68%; 15y 68%.
- Combined: 68%

Summary of Computer Gaming (% of sample exceeding 2 hours/weekday)

- Boys: 11y 74%; 13y 72%; 15y 68%.
- Girls: 11y 44%; 13y 43%; 15y 40%.
- Combined: 56%

Summary of Computer Use Other than Gaming (% of sample exceeding 2 hours/weekday)

- Boys 63%;
- Girls 66%.

Adding the various forms of screen time together produces **much higher levels** of estimated screen time. Aggregated screen time data from HBSC 2018 on recreational screen time on weekdays is around 9 hours/day (SD 6) in boys and around 8 hours/day (SD 5) in girls, and these values have increased over time (as a secular trend).

Gaps in Scottish data:

Available Scottish data are based on parental/self-report and do not always report relative to the international benchmark of 2 hours recreational screen-time/day, or do not provide data for an average day (taking into account differences between weekdays and weekends, schooldays versus non schooldays), and do not always add times spent on screens to provide total screen time. Surveillance of screen time is fairly good for adolescents but much more limited for children.

Benchmark:

% of children and youth who meet the Global Recommendations (WHO, 2020) on Physical Activity for Health, which recommend that children and youth (5-18 years) accumulate an average of at least 60 minutes of moderate- to vigorous-intensity physical activity (MVPA) per day. Children under 5 years of age who are capable of walking unaided should be physically active daily at any intensity for at least 180 minutes, spread throughout the day, and this should include 60 minutes/day MVPA (WHO, 2019; UK Chief Medical Officers, 2019; Canadian Society for Exercise Physiology, 2017). When an average cannot be estimated, % of children and youth meeting the guidelines on at least 4 days per week is considered.

Grading Summary:

An **INC** grade was assigned based on major gaps in Scottish surveillance, as well as the mismatch between what is monitored in Scotland and the benchmark. Levels of MVPA may well be very low (F in previous report cards).

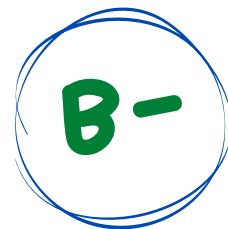
Gaps in Scottish data:

The SHeS does not measure MVPA as noted in previous SHeS reports (e.g. 'no information on intensity of physical activity is collected', SHeS 2019) and Scottish report cards. Scottish government and Scottish government agencies assume that all reported activities in SHeS are MVPA, when in fact most time in the activities reported will be in light intensity physical activity, thus compliance with guidelines levels reported in SHeS are substantially overestimated. This supported by Basterfield et al. (2008) where it was found that in 6-8 year olds, the SHeS measure overestimates MVPA by an average of 2 hours per day. Since SHeS does not measure MVPA, good surveillance data in Scotland are limited to adolescents as noted below. There is also a serious lack of data for older adolescents (16-18 year olds). The AHKGA benchmark is up to age 18, but HBSC surveillance stops at age 15 (HBSC), and in the SHeS, adult PA guidelines are incorrectly applied to 16-18 year olds.

The HBSC does measure intensity and has been validated for adolescents, at least at the population surveillance level (Murphy et al., 2015), thus providing more realistic estimates of compliance for 11-15 year olds that can be used for grading. HBSC Scotland reports data on meeting the MVPA guideline every day, while the AHKGA benchmark (and WHO guideline for school-age children and adolescents) use an average of at least 60 minutes MVPA per day. HBSC 2018 (data collected in 2017-2018) found that the % of 11, 13, and 15 year olds reporting that they did not meet the 60 minutes per day MVPA every day was as follows: 20% for the 11 year olds, 18% for the 13 year olds; 13% for the 15 year olds. The HBSC measures relative to the pre-2020 WHO MVPA guideline for school-age children and adolescents (at least 60 minutes MVPA every day) and the AHKGA benchmark uses the UK Chief Medical Officers 2019 and WHO 2020 Guidelines (an average of 60 minutes MVPA per day), so there is a mismatch between the benchmark and what is measured/reported by HBSC.

There was a suggestion of some inequality in HBSC, with slightly higher prevalence not meeting guideline in those in the lowest family affluence scale, but this is inconsistent with substantial evidence from many large UK and Scottish studies which have used accelerometry to measure MVPA more accurately (they consistently do not find socio-economic inequalities in MVPA). Girls are also slightly less likely to meet the guideline than boys at all ages. Inequality was incomplete for socio-economic status, but a small inequality between boys and girls.

Organised Sport and Physical Activity



Benchmark:

% of children and youth who participate in organized sport and/or physical activity programmes. The benchmark includes sport AND exercise/physical activities, so this indicator is not solely sport and the key word is 'organised' (i.e. the indicator is organised sport and physical activity). There is no recommendation for the frequency/duration of organised sport and physical activity participation.

Grading Summary

A **B-** grade (60-66%) was provided based on SHeS 2019 data for 2-115 year olds, reporting 66% participates in organised sport and physical activity. As participation is lower in 16-18 year olds (not covered in the SHeS), overall child and adolescent participation is likely to be lower than 66%.

Gaps in Scottish data:

Only one source (Scottish Health Survey 2019, published in 2020, reported participation in the week prior to the survey) measured participation in organised sport and PA (in 2-15 year olds) according to the benchmark and the prevalence estimate from this data source does not include participation in organised sport and physical activity within school lessons. There is a lack of data for 16-18 year olds, though participation showed an age-related decline to age 15 years in SHeS data so participation prevalence across the child-adolescent age range will be lower than the 66% in SHeS.

Inequalities were evident in the SHeS data, where participation appears lower in children and adolescents from areas of higher deprivation, in both sexes. Additionally, participation declines with age; no significant differences in participation between the sexes.



Benchmark:

% of children and youth who engage in unstructured/unorganized active play at any intensity for more than 2 hours a day; or % of children and youth who report being outdoors for more than 2 hours a day.

Grading Summary:

Given the lack of suitable evidence, an **INC** was assigned for the 2021 report card. We note that the grade from the 2018 report card was D-, thus levels of active and outdoor play have a lot of room for improvement in Scotland, despite the INC grade.

The previous report card noted gender inequalities in engagement in active play with boys engaging in higher amounts of active play compared to girls during the weekday and weekend.

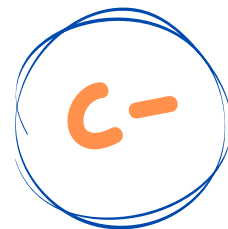
Gaps in Scottish data:

Currently no national survey provides evidence of how much time children are spending in active play for more than 2 hours per day. In the last report card, data from the 2016 Scottish Health Survey was reported in 15-minute blocks which meant the data could be re-analysed to the benchmark. The Scottish Health Survey has changed their data collection for this indicator to number of days the child engages in active play meaning that the data cannot be re-analysed this time.

The recently published “British Children’s Play Survey” does meet the benchmark and provides an informative summary of active and outdoor play levels at a UK level, but given the small sample of Scottish children included in the survey it could not be used for grading. The evidence base for active play thus far has used self/parent reports measurements and self-report measurements often overestimate true levels of active play (as with other indicators such as physical activity). The addition of objective measures of active play, albeit more expensive, would improve the evidence base significantly and enable us to understand how much time Scottish children spend in active play.



Active Transportation



Benchmark:

% of children and youth who use active transportation to get to and from places (e.g., school, park, mall, friend's house).

Grading Summary:

Based on the existing evidence, the grade assigned was **C-** (40-46%). It is worth noting that this indicator is discussed in greater detail in the 'Government' Indicator, highlighting the emphasis placed on active travel as a key means to achieve climate goals.

There is some indication of inequality in active school transport (in older children; there appears to be some differences between 1st and 5th quintile levels of deprivation in both walking and cycling to school).

Gaps in Scottish data:

There are three sources of data available for grading (Hands Up Scotland Survey; Transport & Travel in Scotland; HBSC), with a focus on commute to and from nursery/school only (for 3- to 18-year-olds). There appears to be no data describing active commuting to and from other places. Despite efforts to increase active travel (substantially more government funding), some of the available Scottish data suggest a trend of decreasing active school transport.



Physical Fitness



Benchmark:

Data on physical fitness indicators (e.g. cardiorespiratory fitness, grip strength, balance etc) should be interpreted using sex-specific and age-specific European normative values published by Tomkinson et al., 2018.

Grading Summary:

Given the lack of suitable evidence, an **INC** grade was assigned for the 2021 report card.

Gaps in Scottish data:

There are no nationally representative data on indicators of physical fitness or motor competence in children and young people in Scotland, which has led to an INC grade.



Benchmark:

% of children and adolescents consuming at least 5 portions of fruit and vegetables a day, % of children and adolescents meeting the Scottish Dietary Goals (SDGs) which were revised in 2016 (e.g. average intake of free sugars should not exceed 5% of total energy intake in children over 2 years, average intake in saturated fat should not exceed 11% of food energy intake (often equivalent to total energy in children))

Grading Summary:

Since grading for the 2021 report card could only be based on the % of children and adolescents meeting the 5 portions of fruit and vegetables/day, an **INC** grade was assigned. Despite the INC grade, the prevalence of meeting dietary guidelines among Scottish children and adolescents is low, e.g., prevalence meeting fruit and vegetable intake guideline was well below 20% overall (F grade). The 2018 report card provided a D grade (27-33%).

Fruit and vegetable intake was lower in children and adolescents from more deprived families than those from less deprived families. Socioeconomic patterning was also evident in the intake of several other food groups.

Gaps in Scottish data:

The SHeS fruit and vegetable questions are semi-quantitative (which are used to estimate the % of 2-15 year olds meeting the 5-a-day recommendation) but information on other foods describes frequency of consumption only and does not cover all foods and drinks (thus the data cannot be used to estimate the % of 2-15 year olds meeting/exceeding the SDGs). The National Diet and Nutrition Survey (NDNS) provides comprehensive food and nutrient intake data for children, which is used to calculate average intakes of sugar, saturated fat etc. and can be compared with the SDGs but the % of children and adolescents meeting/exceeding the SDGs is not reported. Recent NDNS data are not available separately for Scotland. The 2008/09 to 2011/12 NDNS was reported for Scotland, this was used in the previous 2016 and 2018 report cards and has been used along with the more recent UK wide data to inform the 2020 report card due to the lack of appropriate data that fit the benchmarks from other surveys.



Benchmark:

% (prevalence) of obesity in children and adolescents. Obesity is an excess of body fatness (a level of body fatness which increases risk of disease) and so, ideally, the prevalence of obesity should be estimated based on body fatness measures from national surveys. In Scotland, as in most other countries, body fatness is not measured and a simpler proxy for body fatness, the Body Mass Index (BMI), is used to estimate prevalence of obesity.

Grading Summary:

The major gaps and problems in obesity surveillance in Scotland summarised below makes it difficult to assign a grade to obesity prevalence, and prevalence of obesity is hard to fit into a grading scheme designed for prevalence of meeting recommendations for health behaviours. This was therefore graded as **INC**. The best surveillance evidence in Scotland comes from Primary 1 (P1) measures of height and weight- these provide large samples with >80% of the population measured, but only in P1.

All Scottish and UK data show that obesity prevalence increases steadily with age after P1 and so the P1 data cannot be used to assign a grade. However, we note that prevalence of obesity in P1 (allowing for the moderately high false negative rate when using BMI for age) is around 10%, and this is much higher in children from more deprived families than those from less deprived families. This higher prevalence in more deprived groups is also supported by findings from the SHeS. Moreover, the gap in obesity prevalence in P1 between the most and least socioeconomically deprived increased substantially over the period 2011-2018 (Stewart et al., 2021).

Gaps in Scottish data:

SHeS obesity prevalence data for older adolescents (16-18 year olds) are expressed using adult criteria, which is incorrect and substantially underestimates the prevalence of obesity quite apart from the inherent error in using BMI. SHeS data for 2-4 year olds are also expressed relative to UK 1990 reference data rather than the WHO multicentre growth reference. Obesity prevalence estimates from the SHeS are compromised further by the relatively small sample size in the survey, producing relatively unstable estimates of prevalence and an inability to examine prevalence inequalities between subgroups. Regardless of how BMI is expressed or interpreted, systematic reviews have shown that BMI provides highly conservative estimates of the prevalence of obesity (excessive fatness), as discussed in the Active Healthy Kids Scotland Report Card 2013 long form (www.activehealthykidsscotland.co.uk).

Family and Peers



Benchmark:

% of family members (e.g., parents, guardians) who facilitate physical activity and sport opportunities for their children (e.g., volunteering, coaching, driving, paying for membership fees and equipment); Or % of parents who meet the Global Recommendations on Physical Activity for Health, which recommend that adults accumulate at least 150 min of moderate-intensity aerobic physical activity throughout the week or do at least 75 min of vigorous-intensity aerobic physical activity throughout the week or an equivalent combination of moderate- and vigorous-intensity physical activity; Or % of family members (e.g., parents, guardians) who are physically active with their kids; Or % of children and youth with friends and peers who encourage and support them to be physically active; Or % of children and youth who encourage and support their friends and peers to be physically active. These were the benchmarks for the Global Matrix 3.0. However, since child and adolescent diet and obesity are indicators in the Scottish report card, we have extended the benchmark to include estimates of parental diet and overweight/obesity. Adult data is used as a proxy for parental influence and the nature of the socio-ecological environment at the family level. This included: % of adults who met the adult physical activity guidelines, % of adults with overweight and obesity, % of adults who met the 5-a-day fruit and veg recommendation; % of adults reporting frequent participation in sport and physical activity and reporting volunteering in sport and physical activity.

Grading Summary:

The available data are somewhat limited and difficult to grade but show that children and adolescents in Scotland grow up in an environment which is characterised by low levels of physical activity, high levels of sedentary behaviour, in which overweight and obesity, and unhealthy diets are the norm. Since 2018, new data have become available on meeting guidelines for musculoskeletal health, and on participation in sport and physical activity and volunteering. These data suggest that things are worse than they appeared in the 2018 Report Card (grade D). Moreover, these aspects of the family environment are much less healthy in more deprived families, supporting the **D-** grade:

- Adult Physical Activity: 40% of men and 34% of women in SHeS 2019 reported that they met the MVPA guideline (note also that this includes some adolescent data inappropriately).
- Adult Leisure-Time Screen Time: Mean of 5.4 hours/weekend day; 6.2 hours/weekday. This cannot be graded but indicates that family environments are characterised by high levels of recreational screen time. Parent and adult modelling of activity and screen time is likely to be unfavourable based on adult physical activity and screen time data.
- Adult BMI: >29% of all adults (from age 16 years as used by SHeS) in Scotland have obesity according to their BMI. Mean BMI was >27 in all age groups over 25. Overweight and obesity prevalence are strongly socially patterned and much more prevalent in more deprived groups (though not reported specifically in SHeS 2019).
- Adult Diet: 22% met the recommendations for Fruit & Vegetable intake and this was strongly socially patterned. Parent and adult modelling of behaviour appears unfavourable.
- Adult participation in sport and physical activity: Around half of adults report participation in >14 of the previous 28 days; this includes walking) and this is significantly lower in women, those from more socio-economically deprived groups, in older adults, and in those with chronic disease;
- Adult sport and physical activity volunteering: 5% of adult men and 2% of adult women reported volunteering in the previous 12 months (volunteering is also less common among more socio-economically deprived adults).

Community and Environment



Benchmark:

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

Grading Summary

Data from the 2018 Scottish report card was much more comprehensive than the data available for the 2021 card so this was used along with the newly available data to assign a grade of **B-**. The rationale for this was that it was unlikely that community and environmental factors would have changed substantially between 2018 and just prior to the Covid era in 2020.

Adults with a lower SIMD score (indicating higher deprivation) reported less frequent visits to outdoors, and were less likely to be a 5 minute walk or less to greenspace compared to those with a higher SIMD score. There were consistent inequalities in young people's perceptions of their local neighbourhood, e.g., from HBSC 2018. On all measures included, young people from the lowest SES group were more likely to report negative perceptions of their local area.

Gaps in Scottish data:

As mentioned, we are not aware of any recently published surveys or studies that can give us an estimate of community and environment. Surveys have looked at frequency of use of outdoors and access to greenspace but these do not meet the benchmark. Furthermore, these studies are based on self-report data and are likely to have some bias. The loss of surveillance of community and environment indicators after 2018 is a concern.



Government: Physical Activity



Benchmark:

Evidence of leadership and commitment in providing physical activity opportunities for all children and youth. Allocated funds and resources for the implementation of physical activity promotion strategies and initiatives for all children and youth. 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) using the HEPA PAT v2 and the scoring rubric published by Ward et al, 2021.

Grading Summary:

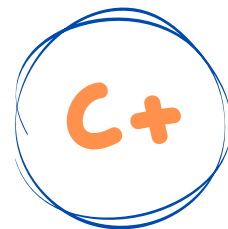
A **C** grade was assigned following assessment of relevant policies. Scotland has many creditable policies at the national level and overall, there appears to be many good links made between the policies and organisations accountable for implementation. There appears to be some level of implementation following on from the Active Scotland Delivery Plan published in July 2018. The Public Health Scotland website highlights 'National actions' that support the Scottish Government's priority to have a more active Scotland and directs users to strategies to increase/improve physical activity in Scotland. In Scotland, physical activity in children is both a priority for health and wellbeing as well as a key means for Scotland to reach their goals of carbon neutral in the future (through active travel). The National Walking Strategy (Let's get Scotland Walking) is a clear example of a policy document that emphasises the importance of physical activity for both of these reasons. This shows a lot of promise for the future of children (and all people) in Scotland.

- There is evidence of leadership and commitment to providing PA opportunities for all children and youth. We have achieved some success in Scotland: physical activity (for people of all ages) is high on the list of priorities as an outcome (for better health and wellbeing) and as a means to achieve other priorities, and there are many relevant policies/strategies/targets in place.
- Funding has been allocated to/dedicated to several causes that should have a positive impact on children's physical activity but largely through active travel (e.g., £27m for active travel in October 2019, Transport Scotland creating a £1m fund for sustainable travel in February 2019, £81k funding for cycle training in children – Play on Pedals – in August 2018). The Scottish government has also got numerous partners to assist with achieving these goals.
- There is clear evidence of leadership and commitment to increasing levels of physical activity and providing physical activity opportunities for children and youth. The allocation of funds and resources for implementation of policy has increased substantially since previous report cards. Progress through the key stages of public policymaking (policy agenda; policy formation; policy implementation; policy evaluation; decisions about the future) is improved but still arguably limited, with some policy efforts stalling at implementation and many at the evaluation stage. Overall, more information about impact is required and future policy documents would benefit including more detailed information about monitoring, evaluation, and reporting.

Gaps in Scottish data:

Despite numerous policy documents, action plans and strategies, more information is required (or needs to be detailed) regarding monitoring, evaluation, funding, and reporting on progress and impact of policies.

Government: Diet



Benchmark:

Evidence of commitment towards improving diet and tackling childhood obesity. Allocated funds and resources for strategies and initiatives to improve diet and tackle childhood obesity. 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) using the HEPA PAT v2 and the scoring rubric published by Ward et al, 2021.

Grading Summary

A **C+** grade was assigned following assessment of relevant policies. There is evidence of commitment towards improving diet and tackling childhood obesity, with several relevant policies/strategies/targets in place, with clearly identified accountable organisations for implementation. Several policies had defined funding. However, for some the source of this was vague. The evidence of monitoring and evaluation and identifiable reporting structures was less clear. There have been few new policies/strategies in this area since the previous report card and the Good Food Nation Bill, which has been proposed since 2014 but is yet to be implemented. Pre-existing policies/targets/strategies include the Criteria for healthcare retail standard (2015), Better eating, better learning: a new context for school food (2014), Beyond the School Gate (2014), A fairer, healthier Scotland: A strategic Framework for Action (2017-2022), Recipe for Success: Scotland's national food and drink policy, becoming a Good Food Nation (2014), Scottish Dietary Goals (2016), Soft Drinks Industry Levy (2018) / The Finance Act (2017) and Scotland's Free School Meals (2015). A further £1 million was invested over a two-year period for providing free school meals during school holidays (2019). March 2020: £30 million allocated to councils to assist in free school meals at the beginning of the Covid-19 pandemic. A further £27.6 million was provided in June 2020. The comprehensive A healthier future: Scotland's diet and healthy weight delivery plan (2018) superseded Scotland's obesity route map (2010). Under the Poverty and Social Justice Policy (2017), the Fair Food Fund supplied grants to 34 community organisations within Scotland to tackle food insecurity and food inequities between 2017 and 2019.

Gaps in Scottish data:

Despite numerous policy documents, action plans and strategies, more information is required (or needs to be detailed) regarding monitoring, evaluation, funding, and reporting on progress and impact of policies.



Summaries: Methods of measurement

Indicator	Summary
Sedentary Behaviours	Most sources of data used self/parent report of recreational screen time (i.e., TV viewing, gaming and other recreational screen time). At least two systematic reviews (Lubans et al., 2011; Active Healthy Kids Scotland Report Card, 2013, longform; and Prince-Ware et al., 2017) concluded that the reliability of self or parent-reported sedentary time was unclear for almost all self-report methods, but a few methods had some evidence of reasonable reliability (including the screen time from HBSC Scotland 2018, used to grade the 2021 Active Healthy Kids Scotland Report Card). These reviews also concluded that most self-report and parent-reported methods had not been validated, and so their accuracy is uncertain. For Scottish surveys it is unclear whether and to what extent measures of sedentary behaviour and screen time are biased, so they can be used in the Scottish Report Card, but with caution. The most likely bias is underestimation of recreational screen time, thus estimates of this behaviour used in Scottish surveys are probably conservative, i.e., exposure to screens may be higher than current Scottish estimates suggest. Time spent in other important forms of sedentary behaviour (e.g. sitting) is not objectively measured in Scottish surveys, but probably very substantial based on objectively measured English data which is readily generalisable to Scotland (e.g., Janssen et al, 2016). Objectively measured sitting time typically accounts for over half of waking time by age 6 years and this increases with age to over three-quarters of waking time by age 15 years, and with age the bouts of sitting become much longer with fewer breaks in sitting.
Overall Physical Activity	Survey data used self/parent report of physical activity or MVPA which creates some doubt about the accuracy of measurement, though the method used in HBSC has some evidence of validity at group level and so is likely to be suitable for surveillance as noted below and in previous report cards.
Organised Sport and Physical Activity	All data sources used self/parent report.
Active Play	This indicator refers to participation in unstructured/unorganized physical activity/active play and time spent outdoors. Perceived safety, access to, and availability of outdoor/indoor spaces and opportunities for PA are dealt with in other indicators. All sources of data use self/parent report measures.
Active Transportation	All sources of data used self/parent/carer reported active travel (i.e., walking, cycling, scooting/skateboarding, and park & stride) to nursery/school.

Summaries, continued (1)

Indicator	Summary
Diet	Self or parent report using 24-h recall for fruit and vegetable consumption and frequency of consumption of selected foods in the Scottish Health Survey (SHeS), and 4-day non-weighed diet diary in National Diet and Nutrition Survey (NDNS). Other recent surveys include the Health Behaviour in School-Aged Children (HBSC) Scotland Study 2018, which collects information on a nationally representative sample of young people aged 11, 13 and 15 years using a self-completion questionnaire. The HBSC collects information on frequency of consumption of fruit and vegetables and other selected high fat/high sugar foods, but does not assess portion size. The Living Costs and Food Survey (LCFS) collects Scottish data on household and eating out food and drinks purchases for every person >7 years of age in each household over a 14 day period using food diaries, which is used to estimate food consumption and nutrient intakes, for a typical average household member (i.e., cannot be reported for children). There is no updated Scottish LCFS data since the previous report card. Data from these surveys cannot be used for grading as they do not fit the benchmarks described above, however they do provide an insight into the (unhealthy) food and drink environment in Scotland.
Obesity	Two sources of data are available: the Scottish Health Survey (SHeS) measured height and weight in 2-15 year olds and the Child Health Surveillance Programme measured height and weight in Primary 1 children (approximately 5 year olds). Scottish Health Survey data for 16-18 year olds are reported separately and with incorrect use of adult BMI criteria for adolescents. The data sources used measured height and weight to calculate BMI, and for children and adolescents aged 2 to 15 years BMI data were interpreted using the UK 1990 BMI reference data. The data sources used BMI \geq 85th percentile to define overweight and obesity and BMI \geq 95th percentile to define obesity.
Family and Peers	Physical activity and diet were measured by self-report; height and weight were measured. Reliance on self-report methods increases risk of bias, and BMI provides a conservative estimate of obesity prevalence in adults (as in children), there is a high false negative rate, particularly in women, so that obesity is much more prevalent than would be suggested by prevalence of high BMI (a lot of adults, especially women, with apparently healthy BMI have excessive body fatness). An additional problem is that 16-18y olds are treated as adults in the SHeS and the adult BMI definitions are applied to define overweight and obesity- this is incorrect as noted above and leads to a further erroneous underestimate of the prevalence of obesity in the adult data in SHeS. Lower BMI cut-offs should be used since BMI does not reach adult values until the end of growth (see Active Healthy Kids Scotland 2018 report card for a more detailed critique).

Summaries, continued (2)

Indicator	Summary
Physical Fitness	-
Community and Environment	This indicator refers to perceived safety, access to, and availability of outdoor/indoor spaces and opportunities for PA in the local community, not actual participation in active play, which is dealt with in indicator 4. In previous report cards, the Scottish Household Survey has provided a reasonable estimate of this indicator through parental reported perceived safety, access to, and availability of their children's play in their neighbourhood. However, in recent versions of this survey, these questions have been omitted. The HBSC study provided some data related to perceived safety which does meet the benchmark, however, this survey only captured one aspect of the benchmark and not other important factors.
Government	The grade for the government indicator was determined using the Policy Audit Tool Version 2 (PAT v2) initially developed by HEPA Europe and used by the Welsh Report Card team (Ward et al, 2021).



References

- Basterfield, L., Adamson, A. J., Parkinson, K. N., Maute, U., Li, P. X., & Reilly, J. J. (2008). Surveillance of physical activity in the UK is flawed: validation of the Health Survey for England Physical Activity Questionnaire. *Archives of Disease in Childhood*, 93(12), 1054–1058. <https://doi.org/10.1136/adc.2007.135905>
- Canadian Society for Exercise Physiology. (2016). Canadian 24-Hour movement guidelines for children and youth (ages 5–17 years): an integration of physical activity, sedentary behaviour, and sleep. <https://csepguidelines.ca/guidelines/children-youth/>
- Canadian Society for Exercise Physiology. (2017). Canadian 24-Hour movement guidelines for the Early Years (0–4 years): an integration of physical activity, sedentary behaviour, and sleep. <https://csepguidelines.ca/guidelines/early-years/>
- Hardie Murphy, M., Rowe, D. A., Belton, S., & Woods, C. B. (2015). Validity of a two-item physical activity questionnaire for assessing attainment of physical activity guidelines in youth. *BMC Public Health*, 15(1), 1–8. <https://doi.org/10.1186/s12889-015-2418-6>
- Janssen, X., Mann, K. D., Basterfield, L., Parkinson, K. N., Pearce, M. S., Reilly, J. K., Adamson, A. J., & Reilly, J. J. (2016). Development of sedentary behavior across childhood and adolescence: longitudinal analysis of the Gateshead Millennium Study. *International Journal of Behavioral Nutrition and Physical Activity*, 13(1), 88. <https://doi.org/10.1186/s12966-016-0413-7>
- Lubans, D. R., Hesketh, K., Cliff, D. P., Barnett, L. M., Salmon, J., Dollman, J., Morgan, P. J., Hills, A. P., & Hardy, L. L. (2011). A systematic review of the validity and reliability of sedentary behaviour measures used with children and adolescents. *Obesity Reviews*, 12(10), 781–799. <https://doi.org/10.1111/j.1467-789X.2011.00896.x>
- Prince, S. A., LeBlanc, A. G., Colley, R. C., & Saunders, T. J. (2017). Measurement of sedentary behaviour in population health surveys: a review and recommendations. *PeerJ*, 5, e4130. <https://doi.org/10.7717/peerj.4130>
- Stewart, R., Reilly, J. J., Hughes, A., Kelly, L. A., Conway, D. I., Young, D., & Sherriff, A. (2021). Trends in socioeconomic inequalities in underweight and obesity in 5-year-old children, 2011–2018: a population-based, repeated cross-sectional study. *BMJ Open*, 11(3), e042023. <https://doi.org/10.1136/bmjopen-2020-042023>
- 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), 1445–1456. <https://doi.org/10.1136/bjsports-2017-098253>
- UK Chief Medical Officers. (2019). UK Chief Medical Officers' Physical Activity Guidelines. <https://www.gov.uk/government/publications/physical-activity-guidelines-uk-chief-medical-officers-report>
- Ward, M. R., Tyler, R., Edwards, L. C., Miller, M. C., Williams, S., & Stratton, G. (2021). The AHK-Wales Report Card 2018: Policy Measures - is it possible to 'score' qualitative data? *Health Promotion International*, 36(4), 1151–1159. <https://doi.org/10.1093/heapro/daaa118>
- World Health Organization. (2019). Guidelines on physical activity, sedentary behaviour and sleep for children under 5 years of age. <https://apps.who.int/iris/handle/10665/311664>
- World Health Organization. (2020). WHO guidelines on physical activity and sedentary behaviour. <https://apps.who.int/iris/handle/10665/336656>

Data tables

Indicator	Table details
Sedentary Behaviours	Table 1: Data Considered for the Sedentary Behaviour Indicator
Overall Physical Activity	-
Organised Sport and Physical Activity	-
Active Play	Table 2: Data Considered for the Active Play Indicator
Active Transportation	Table 3: Data Considered for the Active Transportation Indicator
Physical Fitness	Table 4: Data Considered for the Physical Fitness Indicator
Diet	Table 5: Data Considered for the Diet Indicator
Obesity	Table 6: Data Considered for the Obesity Prevalence Indicator
Community and Environment	Table 7: Data Considered for the Community and Environment Indicator
Government	<p>Table 8.1: Scoring rubric for the Government Indicator (physical activity only)</p> <p>Table 8.2: Descriptive scoring grid for the Government Indicator (physical activity only; links to Table 8.1)</p> <p>Table 8.3: Policy instruments considered to grade the Government Indicator (physical activity only)</p> <p>Table 8.4: Scoring rubric to determine a grade for the Government Indicator (diet and obesity)</p> <p>Table 8.5: Descriptive scoring grid for the Government Indicator (diet and obesity; links to Table 8.4)</p> <p>Table 8.6: Policy instruments considered to grade the Government Indicator (diet and obesity)</p>