

# Results From Scotland's 2013 Report Card on Physical Activity for Children and Youth

John J. Reilly, Smita Dick, Geraldine McNeill, and Mark S. Tremblay

**Background:** The Active Healthy Kids Scotland Report Card aims to consolidate existing evidence, facilitate international comparisons, encourage more evidence-informed physical activity and health policy, and improve surveillance of physical activity. **Methods:** Application of the Active Healthy Kids Canada Report Card process and methodology to Scotland, adapted to Scottish circumstances and availability of data. **Results:** The Active Healthy Kids Scotland Report Card 2013 consists of indicators of 7 Health Behaviors and Outcomes and 3 Influences on Health Behaviors and Outcomes. Grades of F were assigned to Overall Physical Activity, Sedentary Behavior (recreational screen time), and Obesity Prevalence. A C was assigned to Active Transportation and a D- was assigned to Diet. Two indicators, Active and Outdoor Play and Organized Sport Participation, could not be graded. Among the Influences, Family Influence received a D, while Perceived Safety, Access, and Availability of Spaces for Physical Activity and the National Policy Environment graded more favorably with a B. **Conclusions:** The Active Healthy Kids Canada process and methodology was readily generalizable to Scotland. The report card illustrated low habitual physical activity and extremely high levels of screen-based sedentary behavior, and highlighted several opportunities for improved physical activity surveillance and promotion strategies.

**Keywords:** exercise, sedentary behavior, obesity, diet, adolescent

Scotland is a developed northern European nation of 5.2 million people, occupying the northern third of the UK. Scotland has its own legal system distinct from the remainder of the UK (England, Wales, and Northern Ireland), and has its own parliament with responsibility for a number of powers devolved from the UK including education, the environment, transport, roads, planning, sport, child policy, health care, and health policy.

Public health surveillance of physical activity in children and adolescents in Scotland is based currently on the Scottish Health Survey (SHeS<sup>1</sup>) which uses parent-report measures of physical activity, and makes the assumption that all reported physical activity is moderate- to vigorous-intensity physical activity (MVPA).<sup>1,2</sup> The SHeS data suggest that adherence to the 60 minutes per day of MVPA recommendation<sup>3</sup> is very high during childhood, and so that childhood is not the focus of physical activity policy at present.<sup>4</sup> A direct comparison of the SHeS method against accelerometry indicated that levels of MVPA in children are much lower than suggested by the SHeS,<sup>2</sup> while recent longitudinal studies show that MVPA declines markedly during childhood.<sup>5,6</sup> Current Scottish physical activity surveillance is, therefore, somewhat limited and misleading, and the Active Healthy Kids Canada Report Card<sup>7,8</sup> seemed to represent a promising approach to achieving more robust physical activity surveillance and an evidence-informed physical activity promotion strategy in Scotland.

Active Healthy Kids Scotland was created in 2013 ([www.activehealthykidsscotland.co.uk](http://www.activehealthykidsscotland.co.uk)) to develop and launch an evidence-informed knowledge synthesis 'Report Card' in both short<sup>9</sup> and long<sup>10</sup> forms as part of a knowledge translation project modeled

closely on the Active Healthy Kids Canada Report Cards.<sup>11</sup> The primary purpose of this paper is to summarize the process and results of the Active Healthy Kids Scotland Report Card 2013. The report card is based on the best available recent evidence from Scottish children and adolescents.

## Methods

The Active Healthy Kids Scotland Report Card 2013 was produced by a small Research Work Group (RWG), based on the Canadian model.<sup>7,8,11</sup> The RWG consisted of the 4 authors of the current paper. The RWG evidence review and synthesis was reviewed by a small Project Steering Group consisting of 5 academic and policy stakeholders. Following approval by the Steering Group, the work was reviewed by a larger and more diverse Stakeholder Group representing a variety of relevant sectors: academia; health and education practice and policy; transport; sport; play; and major health charities. The wider Stakeholder Group helped identify relevant data and commented on a draft version of the Scottish card. Funding for the Active Healthy Kids Scotland Report Card was provided by a grant from the Scottish Universities Insight Institute ([www.scottishinsight.ac.uk](http://www.scottishinsight.ac.uk)), a consortium of Scottish Universities dedicated to the advancement of knowledge translation. The funding body had no role in the content or presentation of the report card and in the current manuscript.

Since the Active Healthy Kids Scotland Report Card was modeled closely on the Active Healthy Kids Canada Report Card, it was our intention to harmonize indicators (health behaviors and influences) with the Canadian Report Card as much as possible, subject to the availability of suitable Scottish data. However, Scottish public health surveillance data were available for some health outcomes and behaviors not included in the Canadian card, but which are related to physical activity and sedentary behavior. Prevalence of obesity and some aspects of diet were thus included

Reilly (corresponding author: [john.j.reilly@strath.ac.uk](mailto:john.j.reilly@strath.ac.uk)) is with the Physical Activity for Health Group, University of Strathclyde, Glasgow, Scotland. Dick and McNeill are with the Institute of Applied Health Sciences, University of Aberdeen Medical School, Aberdeen, Scotland. Tremblay is with the Children's Hospital of Eastern Ontario Research Institute, Ottawa, Canada.

in the Scottish card. The final Scottish Report Card therefore had a total of 10 indicators (Table 1), with several behaviors and outcomes for some indicators.

During March and April 2013 the RWG searched for relevant evidence from nationally representative surveys within Scotland, in which sampling was stratified to take account of regional and demographic variation.<sup>1,12</sup> Restricting the search to national surveys was appropriate because several such surveys exist within Scotland, and because of the dearth of large nationally representative research studies (eg, birth cohort studies) with high quality measures of the health behaviors and outcomes of interest. Draft grades were assigned by the RWG for the 10 indicators by comparison of the national survey data against a relevant evidence-based recommendation where available (eg, 60 minutes MVPA/day for school-age children and adolescents) using the benchmark approach from the Active Healthy Kids Canada Report Cards:<sup>7,8</sup> grade A (we are succeeding with > 80% of children and adolescents); grade B (succeeding with 60%–79%); grade C (succeeding with 40%–59%); grade D (succeeding with 20%–39%); and grade F (succeeding with < 20%). An indicator was assigned a plus ('+') if there was evidence that trends were improving and/or if there was evidence of negligible disparities (by age, gender, ethnicity, socioeconomic status) and a minus ('-') if there was evidence of worsening time trends and/or marked disparities for the indicator. The probability and likely magnitude of bias arising from error in the measures was also considered for each indicator (eg, in measurement of MVPA by parental report in the SHeS<sup>2</sup> as noted above). Where the probability and magnitude of bias were both high, the measure was not used. For example, a grade was not assigned to the SHeS surveillance measures of MVPA for the reasons given above; a measure from the Health Behavior in School Age Children 2010 Survey (nationally representative of Scotland<sup>12</sup>) which appears to have a much smaller bias when used for the assessment of adherence to physical activity recommendations<sup>14,15</sup> was used instead to assign a grade for this indicator. Decisions of this kind were made by the RWG and Steering Group using a combination of their expertise in the area, reference to recent reviews which summarized evidence on biases in measurement of the various indicators,<sup>16–18</sup> and consultation with stakeholders. Other factors considered were how the report card measure might be improved in the future (eg, by inclusion of a measure currently missing from Scottish public health surveillance, or by inclusion of a better measure of that indicator), and how grades might be improved in the future drawing largely on relevant Scottish evidence-based guidelines.<sup>3,13</sup>

Draft report card grades were considered at a feedback meeting attended by the RWG, the Steering Group and the Stakeholder Group in June 2013. Additional stakeholder feedback was obtained using a formal online consultation on the process and draft grades over a 6-week period during June and July 2013. Stakeholders were asked to address the following questions:

Were any relevant Scottish data missed in the process of card development?

Were any data misinterpreted by the research working group? (eg, were the draft grades justified?)

Were any relevant stakeholder groups or individuals omitted?

Which indicators not included in the 2013 card should be included in future cards?

This consultation process informed the final grades in the short- and long-forms of the report card<sup>9,10</sup> published in October 2013. Both are accessible from the project website [www.activehealthykidsscotland.co.uk](http://www.activehealthykidsscotland.co.uk).

## Results

The Active Healthy Kids Scotland Report Card 2013 is the first of its kind for the country (Figure 1) and is summarized in Table 1. For the category of Health Behaviors and Outcomes, 5 of the 7 indicators could be graded with a degree of confidence based on a combination of the availability of a recommendation and the benchmark of the proportion of children and adolescents meeting the guideline. Active and Outdoor Play and Organized Sport Participation could not be graded due, in part, to a lack of an evidence-based guideline for these behaviors and limited Scottish data.<sup>10</sup> The key health behaviors and outcomes were generally assigned low grades and a grade of F for Sedentary Behavior (recreational screen time) and Overall Physical Activity.

For the category Influences on Physical Activity and Health Behaviors and Outcomes, grade assignment was possible with a degree of confidence, but grades varied substantially (Table 1). The indicator Family and Peer Influence on Physical Activity Behaviors and Outcomes was graded D-. The grade was informed by an obesity prevalence which is high, increasing and socially patterned (adult data); low adherence to physical activity recommendations; and low adherence to dietary recommendations which is socially patterned and worsening over time.

The indicator Community and the Built Environment, which included perceived safety, access, and availability of space for physical activity, was graded B, reflecting the evidence that safety, access and availability of space did not appear to be major barriers to physical activity. The indicator Policy referred to national policy



**Figure 1** — Front cover of Active Healthy Kids Scotland Report Card 2013.

**Table 1 Grades in the Scottish Report Card on Physical Activity for Children and Youth 2013**

Indicator	Grades
Health Behaviors and Outcomes	
Overall Physical Activity Levels	F
Organized Sport Participation	INC
Active Play	INC
Active Transportation	C
Sedentary Behavior	F
Obesity	
Diet	D-
Influences on Health Behaviors and Outcomes	
Community and the Built Environment	B
Family and Peer Influence	D-
National Policies, Strategies and Investments	B

*Note.* The grade for each indicator is based on the percentage of children and youth meeting a defined benchmark: A is 81%–100%; B is 61%–80%; C is 41%–60%, D is 21%–40%; F is 0%–20%; INC is incomplete data combined with lack of an evidence-based recommendation.

only (including the national school curriculum and policy). It was graded B on the grounds that Scotland has many national government policies, strategies and investments which target most of the 7 health behaviors and outcomes included in the card (the notable exception being sedentary behavior).

## Discussion

### Health Behaviors and Outcomes

The lowest grade possible (F) was assigned to both of the report card 'headline' indicators, Sedentary Behavior (defined here as recreational screen time) and Physical Activity. The recreational screen time grade was based on self-reported time spent viewing TV and gaming among 11- to 15-year-old participants in the Health Behavior in School-Age Children Survey 2010;<sup>12</sup> 76% reported more than 2 hours per day of TV alone, and 77% of boys and 37% of girls reported 2 hours per day of gaming in addition to TV viewing. Scottish<sup>13</sup> and international<sup>19,20</sup> recommendations state that recreational screen-time for school-age children and adolescents should be limited to 2 hours a day, thus justifying the F grade.

The overall physical activity grade was also based on Scottish Health Behavior of School Age Children 11–15 years in 2010.<sup>12</sup> The data were based on a simple self-report method which appears to have limited bias for the assessment of adherence to physical activity recommendations.<sup>14,15</sup> Only 19% of boys and 11% of girls 11–15 years of age met the daily recommendation for 60 minutes MVPA.<sup>12</sup>

Neither objectively measured Scottish physical activity surveillance data nor parent-reported or objectively measured data for younger children were available. Data were also not available for objective measures of sedentary behavior or for types of sedentary behavior other than recreational screen time, including constructs of sedentary behavior now considered very important to later health, notably time spent sitting and breaks in sitting time.<sup>21</sup>

Multiple sources of Scottish data were available on active commuting (walking, cycling) to and from school. These data were highly consistent in suggesting that just over 50% of Scottish

primary school children and 40%–50% of high school students normally commute actively to school; hence, a C grade was assigned.

Both obesity (F-) and diet (D-) were difficult to grade; both are health outcomes rather than health behaviors. Multiple sources of Scottish surveillance data indicated an estimated prevalence of obesity that was much higher than at any time in the past, allowing for conservative estimates based on the BMI.<sup>17</sup> Obesity was also socially patterned with higher prevalence among the more socioeconomically deprived. Compliance with recommendations regarding consumption of sugar, fruit and vegetables, and saturated fat among Scottish children and adolescents was generally low, but dietary survey data are not adequately summarized as the percentage of the survey sample meeting the recommendations. This complicates grading with the Active Healthy Kids Canada scale. Compliance with dietary recommendations was also strongly socially patterned. Further discussion of the grades for obesity, diet, and the other indicators is provided in the long-form of the Scottish report card.<sup>10</sup>

### Influences on Health Behaviors and Outcomes

The D- grade for Family and Peer Influence on Physical Activity Behaviors and Outcomes indicates that Scottish children and adolescents develop in an environment which is unfavorable to physical activity and health as evident in adult overweight and obesity, low physical activity, and an 'obesogenic' diet.<sup>9,10</sup> The available Scottish evidence on the adult environment was a proxy for parental influence, since no data on these behaviors were available for the parents of school-age children and adolescents. Data on peer influence on physical activity and sedentary behavior were not available, and as such could not be used to inform the grade.

The B grade for the indicator Community and the Built Environment suggests that Scottish children and adolescents have moderately high perceived safety, access, and availability of space for physical activity. Given the seemingly favorable environment for physical activity, future research should focus on why levels of physical activity are so low and levels of recreational screen time so high.



The national policy environment was also graded B, and appears to be favorable to physical activity and health of Scottish children and adolescents. Many of the relevant Scottish policies are relatively recent and may need greater time and/or greater implementation efforts if they are to impact on the generally unfavorable grades for the indicators in the Health Behaviors and Outcomes category. Moreover, most national policies have not been evaluated; their implementation and/or effectiveness may in fact be limited. The major gap in the national policy environment was the absence of any policies on sedentary behavior.

## Strengths and Limitations

Although grades assigned in the Active Healthy Kids Scotland Report Card 2013 were based on the best available data, the process of developing the report card highlighted a number of gaps in Scottish surveillance of physical activity and health. The 2 most glaring gaps were the absence of objective measures of physical activity and the lack of surveillance of sedentary behavior. The potential for biases in the physical activity surveillance measures used in Scotland, and limitations in their ability to identify secular trends and disparities are critiqued in more detail elsewhere.<sup>10</sup> For some indicators in the Health Behavior and Outcomes category, there were no or only limited data for preschool children. For other indicators, difficulty in assigning a grade arose from a combination of limitations in the surveillance data and the absence of an evidence-based recommendation against which to assess adherence. The long-form of the Active Healthy Kids Scotland Report Card 2013 offers a number of recommendations aimed at improving Scottish surveillance of physical activity and health among children and adolescents.<sup>10</sup> If these recommendations are adopted, future Scottish Active Healthy Kids Report Cards should be more comprehensive, better informed by evidence, and more useful for informing policy and monitoring trends over time.

## Conclusions

Development of the first Active Healthy Kids Scotland Report Card in a relatively short period of time (7 months) and at relatively low cost (total cost < £16,000 sterling (though with some support in kind from the funding body in the form of providing a venue for 2 meetings), suggests that the Active Healthy Kids Canada Report Card is a model of knowledge translation into public health which is readily generalizable. The first Scottish card shows that Scottish children and adolescents have extremely high levels of recreational screen time and low levels of MVPA, and develop in an adult environment where poor diet, low physical activity and overweight or obesity are the norm. However, the first Scottish report card suggests that many of the environmental factors believed to influence physical activity and sedentary behavior are favorable. Future issues of the report card will be useful in assessing whether this favorable policy and community/built environment is having the desired impact on important health behaviors and health outcomes for children and adolescents.

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