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Results from South Africa's 2016 report card on physical activity for children and youth

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Background: We present results of the 2016 Healthy Active Kids South Africa (HAKSA) Report Card on the current status of physical activity (PA) and nutrition in South African youth. The context in which we interpret the findings is that participation in PA is a fundamental human right, along with the right to "attainment of the highest standard of health." **Methods:** The HAKSA 2016 Writing Group was comprised of 33 authorities in physical education, exercise science, nutrition, public health, and journalism. The search strategy was based on peer-reviewed manuscripts, dissertations, and 'gray' literature. The core PA indicators are Overall Physical Activity Level; Organized Sport Participation; Active and Outdoor Play; Active Transportation; Sedentary Behaviors; Family and Peer Influences; School; Community and the Built Environment; and National Government Policy, Strategies, and Investment. In addition, we reported on Physical Fitness and Motor Proficiency separately. We also reported on nutrition indicators including Overweight and Under-nutrition along with certain key behaviors such as Fruit and Vegetable Intake, and policies and programs including School Nutrition Programs and Tuck Shops. Data were extracted and grades assigned after consensus was reached. Grades were assigned to each indicator ranging from an *A*, succeeding with a large majority of children and youth (81% to 100%); *B*, succeeding with well over half of children and youth (61% to 80%); *C*, succeeding with about half of children and youth (41% to 60%); *D*, succeeding with less than half but some children and youth (21% to 40%); and *F*, succeeding with very few children and youth (0% to 20%); *INC* is inconclusive. **Results:** Overall PA levels received a *C* grade, as we are succeeding with more than 50% of children meeting recommendations. Organized Sports Participation also received a *C*, and Government Policies remain promising, receiving a *B*. Screen time and sedentary behavior were a major concern. Under- and over-weight were highlighted and, as overweight is on the rise, received a *D* grade. **Conclusion:** In particular, issues of food security, obesogenic environments, and access to activity-supportive environments should guide social mobilization downstream and policy upstream. There is an urgent need for practice-based evidence based on evaluation of existing, scaled up interventions.

There is growing recognition of the importance of physical activity (PA) in children and youth for the primary prevention of obesity and certain noncommunicable diseases, later in life. Moreover, PA during childhood is essential for normal growth and development, while PA and sport are a platform for the development of social capital, social cohesion and inclusiveness, as well as promoting gender equity.[1] Indeed, UNESCO

(United Nations Educational, Scientific and Cultural Organization)[2] and the World Health Organization[3] consider both the opportunity for children to participate in sport, PA or play, and "the highest attainable standard of health," respectively, as fundamental human rights.

Despite this, some studies have shown a decline in children's PA levels, most notably in low socioeconomic status (SES) groups in high-income countries, or in those children from urban vs rural settings in lower- and middle-income countries (LMICs).[4,5] More locally, results from the South African Youth Risk Behavior Survey 2008 showed that less than half (43%) of adolescents participating in the survey reported sufficient levels of health-enhancing vigorous PA, which is a decrease in prevalence of 2% from 2002.[6,7] Furthermore, the prevalence of childhood overweight and obesity has increased rapidly, particularly in LMICs and middle-income countries including South Africa.[8]

Results from the Healthy Active Kids South Africa (HAKSA) 2014 Report card suggested that, at best, only 50% of children were meeting the recommendations for daily PA, between 30% to 60% of children did not participate in weekly physical education, and children were spending an average of nearly 3 hours per day on screen time.[9] The consumption of fast food and sugar-sweetened beverages was alarming among children and youth, and obesity was on the rise. However, in the same report, promising government initiatives ranged from greater investment in the school sport program, community-based mass participation hubs, and municipal sports and recreation infrastructure and facilities, to increased reach and dietary diversity in the National School Nutrition Program.[9] What was also clear in the 2014 HAKSA report was the fact that many of the risk factors were associated with socioeconomic gradients and gender inequalities, reflecting issues of access and opportunity. These same concerns form part of a global dialogue of the *Open Working Group Report on Sustainable Development Goals (SDG) from a Child Rights Perspective*,[10] reviewed by UNICEF. For example, under the second SDG, "End hunger, achieve food security and improved nutrition . . .", the report focused primarily on stunting and wasting, with no mention of the growing problem of childhood obesity, despite the fact that food insecurity may be common to both.[11] Under SDG 11, "Make cities and human settlements inclusive, safe, resilient and sustainable," however, the report recognizes the need for "universal access to safe, inclusive and accessible, green and public spaces."

Thus, the Healthy Active Kids South Africa (HAKSA) Report Card 2016, fourth in the series, is based on a systematic review of the evidence concerning PA and nutritional status of children and youth in South Africa, maintaining an equity lens. This brief communication summarizes the literature from the previous 5 years, including published, peer-reviewed manuscripts, postgraduate dissertations, websites, and government reports. This evidence may be used to guide policy, develop interventions and programs, and strengthen advocacy to create activity-permissive environments and support healthy eating in South African children and youth.

Methods

The Healthy Active Kids South Africa (HAKSA) Report Card initiative began in 2007, led by members of the now, Division of Exercise Science and Sports Medicine, at the University of Cape Town, and report cards have been produced in 2007, 2010, and 2014. The initiative has been supported by a national private health insurer, Discovery Health, in conjunction with the not-for-profit Sports Science Institute of South Africa. The 2016 HAKSA Report Card has been developed and produced by a working group consisting of 33 academics and/or content experts, and partnering institutions. Initially, key articles were identified by the lead institution. This was done by comprehensive searches on PubMed, Africa Journals Online, EBSCO Host, and Africa Wide databases for evidence over the previous 5 years on PA, nutrition, and overweight in children from South Africa. Exclusion criteria were 1) review articles, 2) studies with subjects over 18 years, 3) studies done in other countries, 4) papers included in previous Report Cards, and 5) studies that were not related to indicators for PA and nutritional status in South African children. The search yielded 1104 titles, from which 126 were extracted for consideration. In addition, hand-searching was done by members of the working group. A subsequent in- person meeting was held with the working group members to reach consensus on the grade assignment, and a smaller representative group was tasked with collating and preparing the manuscript. The partnering institutions have largely been responsible for dissemination of the Report Cards.

The HAKSA 2016 Report Card has been comprised of 2 categories of indicators: PA and nutrition (and body composition). The PA category included the 9 core indicators: Overall Physical Activity Levels, Active Play, Active Transportation, Organized Sport Participation, Sedentary Behavior, the influence of Family and Peers, School and the School Environment, Communities and the Built Environment, and Government Policy, Legislation, and Investment. In addition, we reported on Physical Fitness and Motor Proficiency separately. The indicators for the nutrition category included Over-weight and Under-nutrition along with certain key behaviors such as Fruit and Vegetable Intake, and policies and programs including School Nutrition Programs and Tuck Shops.

Members of the working group conducted quality reviews of the source documents using a modified Downs and Black checklist where appropriate,[12] and constructed evidence-tables to extract relevant information from those sources that were ultimately reviewed. Most of the indicators were informed by regional studies, as there was limited national data available over the past 5 years. In addition, we included a short summary concerning PA and nutritional status in early childhood in South Africa, as a new section. Finally, where possible, we provided recommendations or local examples of promising programs and initiatives, but which may not have undergone robust evaluation or peer-review.

The prevalence or reach (the extent to which the practice or program was accessible to all or most South African children) were considered in the grading process. Grades were assigned to each indicator ranging from an *A*, succeeding with a large majority of children and youth (81% to 100%); *B*, succeeding with well over half of children and youth (61% to 80%); *C*, succeeding with about half of children and youth (41% to 60%); *D*, succeeding with less than half but some children and youth (21% to 40%); and *F*,

succeeding with very few children and youth (0% to 20%), with *INC* (incomplete) referring to programs, policies, or other indicators that had not been fully evaluated, although may be promising. For indicators which do not have prevalence data, additional criteria were considered in the grading process as in the 2014 HAKSA, including the effectiveness of the practice, program, and the extent to which the practice or program was implemented.

Finally, the dissemination plan for the HAKSA 2016 report card includes the usual media channels, previously identified by the supporting institutions and a road show for various government departments and stakeholders. However, the departure this year will be a direct release of the report card results to the children and youth of South Africa, through social media activations. The objective of this release will be to generate and support, "bottom-up" advocacy from children and youth, holding adults and government account- able for creating activity-supportive environments and opportunities, with a focus on equity and access for all.

Results and Discussion

The 2016 Healthy Active Kids South Africa Report Card is the fourth in the series of South African Report Cards, following on from 2007, 2010 and 2014. The grades for each core PA indicator are summarized in Table 1, with a brief discussion and rationale provided. The grades for the nutrition indicators, as well as the grades of the 2014 report card, are summarized in Table 2.

Physical Activity Indicators

Overall Physical Activity Levels: C. As in 2014, there have been no large national studies in the intervening period to inform this indicator. In 2014, the grade assigned was a *D*, based on the regional studies included in the report, as it appeared that overall, less than 50% of children and youth were meeting PA recommendations, including rural communities. More recently, in a regional study in the Western Cape, nearly 75% of the boys and 54% of the girls (ages 11 to 13 years) surveyed were engaged in self-reported moderate-to-vigorous PA (MVPA) at least 3 days per week.[13] In a slightly larger study of more than 750 learners, from 10 schools in the Johannesburg area of the Gauteng province, McVeigh and Meiring[14] found that overall, 78% of learners reported meeting the recommended guidelines of at least 60 minutes per day of MVPA. However, girls fared poorer than boys ($P < .012$), and older children fared less well than younger children. Based on these limited findings, it does appear that at least half the children are meeting recommendations for participation in PA, although special efforts to promote PA for girls and in adolescents are needed. For these reasons, the grade assigned was a *C*.

Physical Fitness and Motor Proficiency: D. There is limited representative data on health-related fitness and motor proficiency in South African children and youth. However, recent data

Table 1 Grades by Physical Activity Indicators in the 2016 Healthy Active Kids South Africa Report Card

for estimated VO_2peak from the Physical Activity and Health Longitudinal Study[15,16] in nearly 300 adolescents showed that in the girls, mean objectively measured

cardiorespiratory fitness was poor, whereas the mean score for the boys was fair.[17] In a cross- sectional sample of more than 1300 primary school children from Mpumalanga and Limpopo provinces, estimated VO_2peak scores for both boys and girls suggested that cardiorespiratory fitness levels were also poor, despite high levels of PA, possibly as a result of the high prevalence of underweight (74%).[18]

Table 1 Grades by Physical Activity Indicators in the 2016 Healthy Active Kids South Africa Report Card

Physical Activity Indicator	2016 Grades
Overall Physical Activity Levels	*C*
Physical Fitness and Motor Proficiency	*D*
Organized Sport Participation	*D*
School	*D*
Active Play	*INC*
Active Transportation	*C*
Sedentary Behaviors	*F*
Family and Peers Support	*C-*
Community and the Built Environment	*C-*
Government Strategies & Investments	*B*

Note. The grade for each indicator is based on the percentage of children and youth meeting a defined benchmark: *A* is 81% to 100%; *B* is 61% to 80%; *C* is 41% to 60%, *D* is 21% to 40%; *F* is 0% to 20%; *INC* is Incomplete data.

In terms of motor proficiency, Pienaar et al[19] recently found that 23% of a sample of more than 800 primary school children (NW-CHILD) demonstrated below average object control skills, with more than 50% having below average overall scores.[20] Differences in scores were linked to gender and socioeconomic status. Importantly, motor proficiency in adolescent South African children has also been linked to academic performance.[21] Based on the studies cited here, the suggested grade for the indicator physical fitness (and motor proficiency) was a *D*.

Organized Sports Participation: D. There are few studies, since the 2014 report card that have examined participation in organized sporting activities of South African children. Of these, Cozett[13] found that just over a third of children aged 11 to 13 years (34.4%) belonged to a sports team, with boys being more likely to belong than girls. Micklesfield et al[22] found similar results in rural adolescents, with learners spending about 25 min/day in organized sport, and greater participation among boys. Based on these results, the grade assigned was a *D*, as we are succeeding with some, but less than half of children and youth, with lower participation rates in girls, once again highlighted.

School (Physical Education, Built and Policy Environments): D. In South Africa, physical education (PE) forms part of the lifeskills curriculum, however, the delivery of PE in South African schools may be insufficient[23] and PE has lost formal instruction time to the lifeskills subject.[24] Time constraints, teachers' workloads, and staff

reluctance to become involved in noncompulsory activities, were the main reasons cited for failure of implementation of PE in South African schools.[25]

Table 2 Grades by Physical Activity and Nutrition Indicators in the 2016 Healthy Active Kids South Africa 2014 and 2016 Report Cards

Category	Indicator	2014 Grades	2016 Grades	Category	Indicator	2014 Grades	2016 Grades
Physical Activity	Overall Physical Activity Levels	*D*	*C*	Nutrition Indicators	Overweight	*D*	*D*
	Physical fitness and motor proficiency	-	*D*		Under-nutrition	*C*	*C*
	Organized Sport Participation	*C*	*D*		Fruit and vegetable intake	*C*	*D*
	School	*D*	*D*		Snacking, Sugar-Sweetened Beverages, Dietary sodium	*F*	*F*
	Active Play	*INC*	*INC*		Fast food intake	-	*F*
	Active Transportation	*C*	*C*		School tuck shop	*D-*	*INC*
	Sedentary Behaviors	*F*	*F*		National School Nutrition Program	*B*	*B*
	Family and Peers Support	*INC*	*C-*		Vegetable Gardens	-	*C*
	Community and the Built Environment	*D-*	*C-*		Food security	-	*D*
	Government Strategies & Investments	*B*	*B*		Advertising and media	*D*	*D*

Note. The grade for each indicator is based on the percentage of children and youth meeting a defined benchmark: *A* is 81% to 100%; *B* is 61% to 80%; *C* is 41% to 60%, *D* is 21% to 40%; *F* is 0% to 20%; *INC* is Incomplete data.

One promising initiative under the nongovernmental organization, Physical Education Institute of South Africa (PEISA), is the Physical Education Symposium report,[23] which outlines a "blueprint" for implementation, and recommends that support and monitoring be provided to schools.[26] A number of small-scale, regional studies have been under- taken, involving either enhanced PE interventions, or whole-of- school, curriculum-based programs, with mixed results. In some cases, MVPA in learners has been shown to increase,[27] whereas in other studies, PA and physical fitness remained largely unchanged.[28] In one study in the Western Cape province, most primary schools had features such as: paved courts for sport, playground equipment and grassy/soft play areas. None of these features was specifically associated with objectively measured MVPA. Policies to promote PA were not associated with increased activity levels. While the availability of changing rooms and green spaces were less common they were associated with greater levels of in-school PA.[29] Taken together, the implementation of PE in schools remains compromised; there are promising examples of school-based interventions which may lead to more PA, and while it is possible to create a school environment which promotes MVPA, South African primary school children have relatively low levels of in-school PA. Therefore, the grade assigned remains a *D*.

There are a growing number of corporate social investment programs which may help to address lack of trained staff, both within the school setting and at community level. For example, social justice programs for physical education and sports development under Move-It, Moving Matters, reach 130 schools and 32,000 learners every day. Programs such as the Sports Internship Training For Unemployed Persons (Sit-Up!) is part of an integrated work experience initiative for school leavers (http://www.moving-matters.co.za/information/sit_up.pdf), aligned to various national qualification and training frameworks, the end result of which is to enhance services at school, community, and municipal sports and recreation facilities.

Active Play: INC. In the 2014 report, there was only 1 peer- reviewed study, in which active play could be assessed as an indicator. To our knowledge, there have been no new studies in which the prevalence or time spent in active play can be quantified. Further analysis of the ISCOLE study of 9- to 11-year-olds, demonstrated that attributes of the built environment, including traffic safety, crime and proximity to recreational facilities appeared to impact on MVPA, out-of-school, but only in children from low socioeconomic communities.[30]

The only additional studies surveyed South African teachers' attitudes to play. Aronstam and Braund[31] found that many teachers did not display an awareness of their role during informal play and often viewed these occasions as purely recreational time for young children with few benefits for learning and little meaningful interaction. More than 50% of teachers claimed their main role during play was to make sure that "no one gets hurt, and that no fighting takes place."

Active play remains an area with insufficient evidence to assign a grade. However, it is important area to gain a better understanding of the potential reach and impact of active play on children's MVPA, and to address issues of social and environmental justice in program delivery.

Active Travel: C. The journeys to and from school provide an opportunity for learners to participate in regular PA. The primary source of data for this indicator is the South African National Household Travel Survey 2013.[32] In 2003, 76% of learners walked all the way to school, whereas in 2013, this dropped to 63%. Moreover, 94% of learners walked 15 minutes or less to their transport or from their transport to school. These results are further corroborated by Sarmiento et al,[33] who found that 58% of 10-year- old learners in the Western Cape reported walking to school, and Larouche et al,[34] who found that active school travel was inversely associated with car ownership.

While active school travel plays an important role in daily PA in children, particularly in rural communities,[15] it remains a point of concern, that "the most vulnerable road users are pedestrians, the most vulnerable pedestrians are children, and the most vulnerable children are the young children of the poor." In the Western Cape alone, child pedestrian fatalities accounted for 13% of all deaths in children in 2013.[34]

Hence, the current evidence is in line with that presented in 2014, and as such, an unchanged grade of *C* was assigned for this indicator. Local and provincial governments should be com- mended for child road safety programs which have been launched, such as Safely Home (https://safelyhome.westerncape.gov.za/campaigns/1498).

Sedentary Behavior: F. The findings of the National Survey of Time Use 2010 reported in the HAKSA Report Card 2014 that suggested that children aged 10 to 17 years of age watched an average of nearly 3 hours of television per day,[36] were reinforced by recent regional studies. A study in primary schools in the Western Cape[14] found that more than 50% of the children watched 3 or more hours of television

daily, with 31% of girls and 25% of boys watching 5 hours or more of television on an ordinary school day. In the Johannesburg metropolitan area, sedentary behavior increased significantly across the school grades and the median reported sedentary behavior across all grades exceeded 500 min/ day. In addition, time spent in sedentary activities was significantly and positively correlated with body mass, and children who spent more than 4 hours/day in front of a screen were twice as likely to be overweight.[14]

Another important consideration is that 51% of South African children and adolescents have their own mobile phone device.[37] Between 60% to 70% of calls made by adolescents are to their friend networks. Recent evidence suggests that South Africans are heavy users of social media, averaging 2.7 hours per day. Active social media accounts grew by 20% in 2014 and a further 10% in 2015, and youth-dominated Instagram use grew by 133% from 2014 to 2015.[38,39]

South African children are not meeting the recommended guidelines of 2 hours of screen time or less per day. Social media and cell phone use is high. There is no new information on non-screen time behavior. In light of these trends in screen time, and the absence of any data on nonscreen time, the sedentary behavior indicator was assigned an unchanged grade of *F*.

Peer and Family Support: C-. Lack of social support for participation in PA remains a challenge in South African children and youth, with between 11% to 54% of adolescent girls citing this as a barrier for them.[15] Peer influence, PA self-efficacy and perceived PA competence have been found to be strong predictors of PA participation in South African senior primary school learners.[13] However, the strongest predictors were when parents participated in PA with their children,[13] provided transport[30] or gave them encouragement and support.[13]

One of the main reasons for lack of parental support, particularly in rural communities, was the cultural perception that sport participation was not ideal for girls, because this took them away from their household chores.[40] In some regional studies, it was clear that one of the barriers to participation was the fact that parents did not seem to value sport and PA for their children.[40] The children themselves cited barriers such as lack of time to do work/school work, lack of skills and equipment, and the fact that PA made them sweat, while enjoyment and recognizing health benefits, were positively associated with PA.[40,41]

The 2014 HAKSA report card noted that "South African children are clearly not receiving sufficient familial support for PA," which remains essentially unchanged. There is a need for community-based strategies, designed to provide opportunities for enjoyment and self-expression through PA in South African children and youth and the support of families and peers, to promote such opportunities for PA in the children. For these reasons, the grade assigned remains a *C-*.

Influence of the Community and the Built Environment: C-. Lack of facilities, unsuitable sporting facilities/clubs in the area of residence, insufficient access

to facilities and programs, or facilities located too far from their place of residence remain among the commonly cited barriers to participation in sport and PA for South African children.[41–43] Actual crime rates and motor vehicle accidents were inversely associated with objectively measured MVPA in South African children.[30] Furthermore, existing facilities have been poorly maintained and in some instances abandoned as a result of resource constraints.[44]

One of the stated aims of the Department of Sports and Recreation South Africa (SRSA) in the Annual Performance Report 2016–17[44] was to "provide adequate sport and recreation facilities and ensure that these are maintained" throughout the country. Out of the 24,365 schools in South Africa, 13,500 are registered to provide school sport (55.4%).[45] Together with other departments and stakeholders, they have prioritized selected projects, including the building of community gyms in open public spaces, particularly in rural areas; the development and or refurbishment of children's play parks; and the installation of multipurpose courts and other sporting fields. In addition, they have committed to the development of 52 sport complexes, with their location determined by the ease of access by the community.[44] As in the 2014 report, there is a need for greater community engagement, however, the plans outlined by the national government demonstrate promising moves toward greater reach and access, and as a result, the grade assigned was a *C*-.

One of many encouraging examples of community engagement is Project Playground, a Swedish/South African non-profit organization, focused on "creating meaningful spare time" and social development for children and youth, through free, daily, after-school activities, sports and cultural programs, for ages 4 to 21 years. Project playground operates in 3 disadvantaged com- munities of the Western Cape (http://www.project-playground.org/ operationsouthafrica.aspx).

Government—Strategies, Policies, Investments: B. The Sports and Recreation South Africa (SRSA) school sport program, which was launched in 2011 remains as a core deliverable for SRSA in the 2016–17 strategic plan. The Department of Basic Education (DBE) and SRSA have committed to work jointly to maximize access to sport, recreation and PA in every school in South Africa.[46] The Department of SRSA plans to roll out school sport to 10,000 schools over the medium term.[46] There has been a reprioritization of resources to ensure that 40% of SRSA National Budget, and 50% of the SRSA conditional grant is allocated to School Sport. However, to date, compliance to the school sport program remains generally poor. Therefore, in an effort to improve service delivery, interventions will be presented in the 2016–17 Grant Framework document[47].

Furthermore, due to the magnitude of the school sport program, SRSA has been actively engaged with other stakeholders in an attempt to secure private partnerships and funding to increase the participation base for school sport.[47] Thus, for the level of government engagement and investment, this indicator remains unchanged and was assigned a *B*.

Another example of private sector, social investment in sports programs is the non-profit company called Sporting Chance, which provides opportunities for disadvantaged children to play Street Cricket or Street Soccer within their own communities. Since its inception, the Street Cricket program has involved nearly 15,000 children, and provides training and a stipend for over 1350 unem- ployed adults. Street soccer purports to reach more than 6000 children weekly and is implemented in 40 communities, country- wide (http://www.sportingchance.co.za). The challenge for these programs remains the need for ongoing, robust monitoring and evaluation.

Nutrition Indicators

Overweight and Obesity: D. The HAKSA Report Card of 2014 reported that the prevalence of overweight and obesity among children and adolescents was high, especially in girls and in urban areas. For example in 10- to 14-year-old girls and boys, the combined prevalence of overweight and obesity were 23% and 10%, respectively, and in 15- to 17-year-old girls and boys, the prevalence were 27% and 9%, respectively.[9,47] Since the 2014 Report Card, in the absence of national data, regional studies corroborate the growing public health challenge of childhood overweight and obesity,[14, 15, 48-51, 53-56] especially among the girls and in urban areas [14,49,57,58]

Moreover, in a 20-year prospective study, South African boys who were obese at 4 to 8 years old were 19.7% times more likely to be obese at age 16 to 18 years, and girls who were obese at 4 to 8 years old were a staggering 42.3 times more likely to be obese at 16 to 18 years compared with nonobese children.[49] Similar trends were evident in a 3-year follow-up study, among 6- to 9-year-old children, where the prevalence of obesity increased from 10.6% to 14.9% for boys and 14.7% to 18.5% for girls, respectively.[55] The secular trends in the smaller, regional studies corroborate those found previously in the 2014 report, with levels of overweight and obesity continue to rise among children and adolescents, particularly in girls and in urban settings. In addition, the combined overweight and obesity prevalence for girls are close to that of American girls, and the prevalence of boys just below American boys.[56] As a result, the grade assigned remains a *D*.

Undernutrition: C. In the absence of national survey data since the 2014 report, regional studies suggest a trend for the prevalence of underweight in urban and township children to decrease. To the contrary, high levels of under-nutrition are still prevalent among children from low socioeconomic circumstances, especially in boys and in rural areas.[59]

The prevalence of under-nutrition is decreasing at a slow pace, but under-nutrition continues to coexist with over-nutrition. This coexistence is most evident in low socioeconomic living conditions, with boys mostly affected. Given these trends, the grade remains a *C*.

Fruit and Vegetable Intake: D. Of the studies and reports that were identified concerning fruit and vegetable intake in South African children, none were representative, and few were adequately statistically powered. The 2015 report by Graham and coworkers[60] assessed the impact of the school feeding programs on fruit and vegetable consumption in primary school learners in the Eastern Cape. Most children (n = 208) had eaten less than 1 portion of fruit or vegetables on the previous day, and none had eaten the recommended 5 portions per day. The limited evidence on the inclusion of fruits and vegetables as part of the National School Nutrition Program (NSNP) and the lack of any large-scale studies showing an improvement in fruit and vegetable intake, resulted in a downgrading of the score to a *D*.

Snacking Behavior (Sugar-Sweetened Beverages, Added Dietary Sugar, and Sodium): F. There were no nationally representative data, but the key study that informed these nutritional indicators was a cross-sectional, food frequency survey in nearly 1500 adolescents from Soweto. Briefly, researchers found that sugar- sweetened beverages were consumed 8 to 10 times per week, that girls consumed some sort of confectionary more often than their male counterparts (13 vs 11 times per week, respectively), that mean weekly added sugar intake for these items was over 550 g for boys and over 450 g for girls, and that mean dietary sodium intake from salty snacks was approximately 4.8 g/wk. This meant that the average daily added sugar intake was 3 times higher and salt intake more than half the daily, recommended intake, from these snack foods alone.[61] For these reasons, snacking and the intake of added sugar and salt were assigned the grade of *F*, for failing to meet the recommendations for a majority of children and youth.

Fast Food Intake: F. Only 2 studies reported on fast food intake since the 2014 report card. The HealthKick study in 16 Schools in the Western Cape reported a small percentage of children eating take away foods the day before data collection,[62] while Feeley et al[51] reported that the nearly 1500 older adolescents interviewed in Soweto, consumed fast food items 11 times per week. The latter observation is corroborated by the Insight Survey's latest Fast Food Industry Landscape Report 2015 which states that "fast food is experiencing exponential growth with local consumers (16+ years old) increasing from 66% in 2009 to 80% in 2014. Within this statistic, we see that individuals who have purchased Fast Food over a 4-week period has risen by close to 10 million within the last 5 years (http://www.insightsurvey.co.za/blog/is-sas-love-for- fast-food-defying-banting)." For these reasons, the grade assigned to fast food consumption remains at an *F*.

School Tuck Shops: INC. Only 1 manuscript was found that reported tuck shop data between 2014 and 2016. The school HealthKick study in the Western Cape[63] reported some improvement in the school food and nutrition environments, especially regarding school tuck shops and vegetable gardens over the 3-year intervention period, but the scope of the study and the results of the study were too limited to influence the 2014 grade and it was suggested that the grade change to INC.

National School Nutrition Program (NSNP): B. Graham et al[60] reported positive outcomes of the NSNP on stunting and obesity levels, although no real control group was included and the time lapse between pre- and postmeasurements was very short. The reach of the program appears to remain at 9 million children, with 341 schools monitored for successful implementation.[64] There was also some indication that the NSNP impacts on healthy eating practices[65] in children. The grade assigned remains a *B*, although there is a need for external evaluation of the effectiveness of the program.

Vegetable Gardens: C. The number of vegetable gardens in the NSNP remained stable (8717 in 2014 vs 8894 in 2013),[64] and as there is still no large-scale evaluation of successful implementation of vegetable gardens in schools, the grade remains a *C*. One school- based intervention study, HealthKick in the Western Cape, did report moderate success with the establishment of vegetable gardens, and at the end of the study 4 out of 8 intervention schools had vegetable gardens (only 1 school had a garden at the beginning of the study).[63]

Food In/security: D. In 2013, Statistics South Africa reported that 22.8% of children had inadequate access to food while a further 7.8% had severely inadequate access to food. Furthermore, in 2015–16, the unemployment rate in South Africa increased to 26.7% percent—the highest in 11 years. Unemployment has a devastating effect on people's ability to access healthy food. For example, in a year of rapidly rising unemployment, fruit and vegetable prices increased by more than 18% and the overall food basket price for South Africans has increased by 10%. This may be contrasted to the expected real increase in salaries of between 1% to 2%. While there is a system of social grants to provide relief, child hunger is still most prevalent in the poorest households. Furthermore, there is no 1 single government act that effectively deals with the issue of food insecurity, despite the fact that access to sufficient food and water is a guaranteed right. The ongoing challenge of food insecurity and childhood hunger, juxtaposed with childhood and adult obesity, has resulted in a grade assignment of *D*.

Advertising and Media: D. Although there was draft legislation prepared on the control of marketing of unhealthy foods and beverages to children, since 2014 it has not yet been promulgated. In the intervening period, we could find only 1 study that addressed the urban, obesogenic environment and the density of visual advertising media in one's neighborhood.[66] In Soweto, a total of 145 advertisements for sugar-sweetened beverages were found over a driven or walked distance of 111.9 km. The density of advertisements was 3.6 per km^2 in relation to schools (increasing intensity with closer proximity to schools), and 50% of schools had branded advertising on their school property. Most of the 180 vendors in the study sold sugar-sweetened beverages, with half of the schools displaying advertisements of these beverages on school premises. For the delay in government legislation controlling advertising, and the ubiquitous nature of advertising sugar-sweetened beverages in and around schools, the grade assigned remains a *D*.

Early Childhood Physical Activity: INC. In the 2016 HAKSA, we introduce a new area of focus on early childhood PA and nutrition. There is limited research on PA, sedentary behavior and gross motor skills in young South African children. One observational study in preschools, from a range of income settings in Cape Town, found that preschool children spent 73% of their time engaged in sedentary behavior, and 86% of their time indoors. Children were less likely to be active if they were underweight or obese.[67] Conversely, in a study of urban and rural 6 year olds from the North West Province, the majority of children showed full mastery of most gross motor skills (including locomotor and object control skills, and balance).[68] While gross motor proficiency does not appear to be a major problem in early childhood, time spent in sedentary behavior and time spent indoors at preschool, are potential areas of concern. There was no grade assigned, as there was insufficient evidence.

Early Childhood Nutritional Status: D. Young children in South Africa are consuming a diet that is typically lacking in dietary diversity, high in starchy foods and low in fruits and vegetables.[69] Lack of dietary diversity increases risk for suboptimal growth and development and adverse health outcomes. Furthermore, South African children continue to experience the double-burden of over- and under-nutrition. Data from the South African National Health and Nutrition Examination Survey (SA NHANES-1) showed that the prevalences of overweight (18.2%) and obesity (4.7%) among 2- to 5-year-old children were of concern. Conversely, under-nutrition had improved from 2005 among 4- to 6-year-old children, although boys fare worse than girls, and stunting remains a problem in 19.5% of 2- to 5-year-olds.[47] Both forms of malnutrition place children at risk for future noncommunicable diseases, and therefore the overall grade assigned was a *D*.

Limitations and Strengths

As in the 2014 report card, there are few indicators for which there are substantial, nationally representative data, particularly for PA and dietary behaviors. Inadequately powered studies, lack of harmonization of the various constructs for defining PA indicators, and no regular or planned surveillance, makes it difficult to interpret secular trends, or evaluate natural experiments (outcomes of policies or programs). Certain constructs, such as active play, remain virtually unstudied.

Furthermore, there is limited intervention-based research, whether targeting children and youth, with respect to sedentary behavior and increasing participation in organized sport, or by changing the policy environment, such as the marketing of unhealthy foods and sugar-sweetened beverages to children. There is an ongoing need for practice-based evidence, in which programs already implemented at scale, are evaluated to determine the factors that contribute to their effectiveness and sustainability. Some of the strengths of this report are the various implementation examples, and the exploration of PA and nutrition in early childhood, as well as the inclusion of physical fitness and motor proficiency as a PA indicator.

Conclusion

Although the overall grade for PA in the Healthy Active Kids South Africa 2016 Report Card improved from a *D* to a *C*, the majority of the indicators remained the same in 2016.

We have tried to present PA and nutrition indicators within the broader context of the Sustainable Development Goals, with PA and healthy eating considered fundamental human rights. Moreover, we have tried to highlight where gender, ethnicity, and/or socioeconomic status, intersect with equity of access and participation. More than ever before, we believe that only by combining upstream policy solutions with downstream social activation, by all stakeholders, including the children and youth, will we be able to increase access to and participation in PA and promote and support healthy eating.

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