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Results from Hong Kong’s 2016 report card on physical activity for children and youth

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Results from Hong Kong’s 2016 Report Card on Physical Activity for Children and Youth

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Abstract

Background: The Hong Kong’s 2016 Report Card on Physical Activity (PA) in Children and Youth is the first evidence-based synthesis of various indicators related to individual behaviors that contribute to overall PA levels, settings and sources of influence, and strategies and investments in Hong Kong. Methods: Following a standardized protocol, currently best available data for Hong Kong youth were collated and evaluated by an expert consensus panel on 9 indicators (5 activity behaviors and 4 influences on these behaviors). Results: Less than half of the children and youth met the recommended PA level. As a result, a D grade was given for Overall PA levels. Organized Sport Participation and Active Transportation received grades of C– and B, respectively. Sedentary Behaviors and School scored as C grade. Community and Built Environment scored a grade of B. Family Influence received as low a score as overall PA (D). Active Play and Government were not graded due to incomplete data. Conclusions: PA levels are low and sedentary behaviors are high for children and youth in Hong Kong. Promising policies exist in schools and features of community and the built environment are favorable. Increasing family support should be emphasized for future PA promotion.

Key words: exercise, sedentary behavior, adolescent, family support
Insufficient physical activity (PA) and high levels of sedentary behavior have been well documented as risk factors for cardiometabolic disease. Current public guidelines recommend that children and youth should accumulate at least 60 minutes of moderate to vigorous PA daily and reduce screen-based behavior to not more than 2 hours a day. Despite the compelling evidence on the health benefits of living an active lifestyle, the majority of children and youth in Hong Kong do not meet the recommended PA levels and excessive screen time is one of the public concerns in Hong Kong. To promote an active lifestyle, a more promising approach is necessary to improve current surveillance data, inform evidence-based strategies, and foster relevant policy development.

The Active Healthy Kids Hong Kong (http://activehealthykidshongkong.com.hk/) was established in 2015 to consolidate the best available evidence on PA behavior in children and youth to drive policy development and guide research strategies. Based on the previous success of Report Cards from various countries, the first Hong Kong Report Card on Physical Activity for Children and Youth was launched in 2016. This paper aims to present the key findings of the first Hong Kong Report Card on Physical Activity for Children and Youth.

Methods

The 2016 Active Healthy Kids Hong Kong Report Card was produced by a Research Work Group (RWG) consisting of 6 researchers with expertise in PA, physical education (PE), exercise science, and public health from two research-led universities in Hong Kong. The group leader of the RWG was responsible for securing the funding and all members of the RWG were responsible for searching evidence, determining indicators and benchmarks, assigning grades,
and disseminating the Report Card. A stakeholder group representing academic, government and non-government sectors (medical doctors, educators, health practitioners, and policy makers) were then informed. The role of the stakeholder group was to: firstly, inform the RWG of any sources of data that were potentially missed; secondly, provide feedback on the initial grades at a half-day meeting or via email communication; and finally, help the RWG disseminating the Report Card to the community.

In line with the well-developed model of the Active Healthy Kids Canada Report Card,7 the 1st Active Healthy Kids Hong Kong Report Card included 9 core indicators related to individual behaviors that contribute to overall PA levels, settings and sources of influence, and strategies and investments (Overall Physical Activity Levels, Organized Sport Participation, Active Play, Active Transportation, Sedentary Behaviors, Family, School, Community and the Built Environment, Government Strategies and Investments). Four types of data sources were searched: (1) published journal articles in peer-reviewed journals; (2) government reports; (3) national relevant journals; and (4) manual search and personal contacts. The inclusion criteria were (1) studies or reports with children and youth aged 3 to 18 years in Hong Kong; (2) studies or reports relevant to at least one of the indicators; (3) studies or reports with a representative sample; (4) sampled for not more than 10 years. Accordingly, multiple data sources were identified and used to inform the grades (details shown as follows). The majority of the data sources were from approximately 74,000 children and adolescents aged 6-17 years and more than 400 schools. Only one data source included preschool children.8

- Physical Fitness Test for the Community: This was a territory-wide community fitness survey conducted from April 2011 to January 2012.8 This study was commissioned by
the Community Sports Committee of Hong Kong and organized by the Leisure and Cultural Services Department. A series of standardized physical fitness tests and questionnaire survey according to National Physical Fitness Test Handbook were performed. Through stratified random sampling method, 8,178 Hong Kong citizens aged 3-69 years were recruited. Relevant data for preschoolers (3-6 years, n=584), children (7-12 years, n=2,723), and adolescents (13-19 years, n=2,517) were used for Report Card.

- **Child Health Survey (CHS) 2005-2006**: CHS was a commissioned project by the Department of Health. The survey aimed to provide baseline data on health status of children and youth aged 14 years or below in Hong Kong. A total of 7,393 children and youth were surveyed using systematic random sampling. The survey consisted of 6 aspects of health-related scopes including diet and PA.

- **International Physical Activity and the Environment Network (IPEN) Adolescent Study-Hong Kong**: This epidemiological study is part of the IPEN project (http://www.ipenproject.org/). It aimed to investigate the associations of environmental, psychosocial and behavioral variables with body mass index in adolescents in Hong Kong. Using a two-stage stratified sampling strategy, 1,363 adolescents (11-18 years) and one of their parents/primary caregivers residing in different types of neighbourhood were recruited. PA and sedentary behavior were measured using both subjective and objective methods. PA-related psychosocial and environmental correlates were surveyed using validated scales.

- **Understanding Children’s Activity and Nutrition (UCAN) Study**: The UCAN study was a 3-year longitudinal investigation on the determinants of PA and sedentary behavior in Chinese children in Hong Kong. A total of 1,666 grades 1-3 children were initially
recruited in 2009 from 24 primary schools varying in social economic status.\textsuperscript{11} PA and
sedentary behavior were assessed by a validated questionnaire\textsuperscript{12} and an ActiGraph
accelerometer (for subsample only).

- **Hong Kong Student Obesity Surveillance (HKSOS):** The HKSOS was a population-based
  surveillance aiming to monitor trend of childhood obesity and its risk factors.\textsuperscript{13,14} The
  baseline data collection was conducted in 2006-2007 among 32,005 students from 42
  randomly selected secondary schools from each of the 18 administrative districts in
  Hong Kong.\textsuperscript{13} In 2007-2008, follow-up measurements were conducted among 61% of
  the sample with 9,993 students providing complete information on both time points.\textsuperscript{14}
  Exercise (defined as structured physical activities) and non-exercise PA (defined as
  movement necessary for normal living such as walking for transportation) were assessed
  by self-reported questions.\textsuperscript{15}

- **2005-2006 Hong Kong Growth Survey:** The survey aimed to monitor secular trends in
  anthropometric features of Hong Kong children and youth aged 6-18 years.\textsuperscript{16} A total of
  14,842 students were enrolled from randomly selected 18 primary and 18 secondary
  schools from 18 districts. Self-reported sport participation was only available for
  adolescents.\textsuperscript{17}

- **Youth Survey on Usage of Internet and Social Network Websites:** It was a survey
  conducted by Public Opinion Programme at the University of Hong Kong in 2010.\textsuperscript{18} 825
  Cantonese speaking youth aged 12-23 years were interviewed through telephone.

- **Healthier Lifestyle for Primary School Children:** It was a review conducted by the Audit
  Commission of the Hong Kong Government to examine various school-based
  programmes pertaining to a healthier lifestyle for primary school children.\textsuperscript{19} The audit
survey was collected from 426 schools from December 2008 to January 2009 and covered various scopes including school-related PA policy and strategies.

- **Thematic Household Survey Report No. 47**: It was a survey conducted during March to April 2010 by the Census and Statistics Department of the Hong Kong Government. The survey aimed to collect information on public views on the provision of sports facilities and levels of interest and participation in sports among Hong Kong residents aged 12 years and above. In particular, this survey focused on the sports facilities within a 15-20 minutes walking distance from home of the respondents. A total of 8,028 households were successfully surveyed and the results for the two age groups (12-14 year olds and 15-25 year olds) were used for this Report Card.

The draft letter grades for the 9 indicators were assigned based on the proportion of children meeting the pre-defined benchmarks (Table 1): A, 81% – 100%; B, 61% – 80%; C, 41% – 60%; D, 21% – 40%; F, 0% – 20%; INC, incomplete data. Grades may be graded down (−) or up (+) based on the presence of disparities in age, gender, socioeconomic status (SES) or on the trends of the behaviors. Factors considered for assigning a grade were representativeness of the sample, quality of the measurement (subjective or objective, validated measures or not), and sampling period. Objective measures of PA or subjective measures with sound methodology (e.g. how the questions were asked and whether they have been validated) took precedence. The RWG met to evaluate the available data source for each indicator and draft grades were assigned once consensus was reached. Draft grades were then discussed and commented by the stakeholder group at a feedback meeting held in May 2016 or through email communication.
Final report card grades were finally confirmed and are accessible from the project website http://activehealthykidshongkong.com.hk.

Results

The 2016 Hong Kong Report Card (Figure 1) is the first assessment of PA related behaviors and settings of influence, and strategies and investments. Table 2 shows the letter grades for each indicator.

The behavior indicators were generally assigned low grades. Overall Physical Activity Levels were graded D with age group disparity. Organized Sport Participation and Active Transportation were graded C– and B, respectively. Both of these two indicators were graded based on evidence available for adolescents only. We could not assign a letter grade for Active Play (graded as “INC”) due to a lack of data. Sedentary behavior was graded C based on various data sources for children and adolescents.

The indicator Family and Peers Influence was renamed as Family Influence due to a lack of nationally representative data on peer influence. Family Influence received the lowest grade D as less than half of the preschoolers, children and adolescents participated in PA with their family at least once per week.8 School and Community and Built Environment achieved grades of C and B, respectively, which were based on data available for either children or adolescents.

Meanwhile, the indicator of Government Strategies and Investment was graded INC due to insufficient available data which made it difficult to determine the outcomes and impact.
Discussion

Overall Physical Activity Levels: D

The low grade of Overall Physical Activity Levels indicates that less than half of the children and youth in Hong Kong met the daily recommended PA guidelines. It was important to note that disparity existed between self-report and objective measures of PA. Only one study reported overall PA in preschool children and showed that 18% of the young kids spent at least one hour per day in PA.\(^8\) However, the percentage cannot be generated for meeting the PA recommendation for young kids, i.e. 180 min of PA per day.\(^{22}\) A national survey showed that the self-reported proportion of meeting PA recommendations for school-aged children and adolescents was as low as 10%.\(^8\) The percentage was slightly higher in boys (9.5%) than in girls (7.0%) for primary school students; while more adolescent boys (12.8%) than girls (4.2%) met the PA recommendation.\(^8\) Although these data were from the well-established National Physical Fitness Test, a lack of methodologic details made it difficult to evaluate the properties of the questionnaire used in this study. Accelerometer data showed that the percentage ranged from 22% to 50%\(^{11}\) for children and nearly 90% for adolescents.\(^{23}\) The extremely high compliance rate of PA guidelines in adolescents may be partly explained by the high percentage of well-educated parents (80% of the parents with higher secondary school or higher education level).\(^{23}\) Considerably more objective measures of PA are needed for preschool and school-aged children and youth. For existing surveillance surveys, valid and reliable questionnaires should be used and properly reported.

Organized Sport Participation: C−
Data from two citywide surveys showed that 40%-50% of the secondary school students participated in exercise class other than PE outside school.\textsuperscript{14,17} Organized Sport Participation was therefore graded C\textendash due to an apparent lower participation in girls (30\%) than that in boys (41\%). Since no data are available for children, the grade for this indicator can only be applied to adolescents.

**Active Play: INC**

Although active play has been graded in several countries’ Report Card,\textsuperscript{24-26} there is a lack of consensus on a robust definition as some studies use playing outdoors to determine this indicator performance in their respective countries.\textsuperscript{26,27} There are currently insufficient representative data relevant to active play for Hong Kong youth. Non-exercise PA has been reported for adolescents in Hong Kong; however, it was defined as movement behaviors such as walking for transportation and climbing stairs.\textsuperscript{13} As a result, Active Play was graded as INC.

**Active Transportation: B**

Active travel has been shown to contribute to a significant proportion of overall PA in youth.\textsuperscript{28} Hong Kong is an ultra-dense metropolis. Most districts are highly self-contained and children usually attend schools close to their home.\textsuperscript{29} The grade of B for active transportation was determined based on a citywide survey for adolescents\textsuperscript{23}, which showed that 77\% of the girls and 80\% of the boys commuted to school by active modes at least once per week. For primary school students, a recent longitudinal study showed that half of this cohort walked to school regularly.\textsuperscript{30} Furthermore, a change from passive to active travel to school was positively associated with two-
year changes in MVPA on weekdays.\textsuperscript{30} Active transportation to other destinations, however, has not been well investigated in Hong Kong youth.

\textbf{Sedentary Behaviors: C}

Screen-based behaviors have been consistently shown to be associated with various cardiometabolic risk factors.\textsuperscript{31,32} Due to the widespread use of tablet computers and smartphones, screen time has become the main public concern in Hong Kong.\textsuperscript{5} A grade of C was allocated to sedentary behaviors based on the results from 3 surveys.\textsuperscript{9,18,33} The proportion of children and adolescents who spent less than 2 hrs per day in screen time ranged from 42\% to 61\%.\textsuperscript{9,33} Half of the youth aged 12-23 years spent less than 2 hrs per day in Internet.\textsuperscript{18}

\textbf{Family Influence: D}

Base on a national survey, 49\% of preschoolers in Hong Kong participated in PA with their family members for at least once per week.\textsuperscript{8} The proportion declined to 37\% for children and 23\% for adolescents.\textsuperscript{8} The indicator of Family Influence was therefore assigned a grade of D. These findings indicate that parents’ influence may decrease while peer influence is becoming more important when children grow up with more autonomy. However, peer influence could not be graded due to insufficient data. A survey study conducted among 303 grades 4-6 students in Hong Kong showed that girls tended to be more physically active if they perceived more support from their peers.\textsuperscript{34} Future research on peer support of PA from representative sample is needed for Chinese children.

\textbf{School – PE, PA-related Policy, and Programs: C}
School plays an important role in promoting PA participation for children and youth. An audit survey conducted in 2009 for primary schools was selected as the major data source to determine the grade of School. Education Bureau (EDB) is a government entity that oversees the implementation of education programmes including PE in Hong Kong. According to the curriculum guide from the EDB, both the primary and secondary schools in Hong Kong should allocate 5% to 8% of the total curriculum time to PE, corresponding to 70 to 120 minutes per week. Based on the audit report, 77% of the responding schools (n=426, 82% response rate) allocated 70-120 minutes of PE lesson per week for the school year 2008/09. However, the actual length of PE lessons was found to be 22% shorter than the scheduled one for secondary school students. Sport-related extra-curricular activities were popular for the secondary schools, with 98% of them participated in inter-school sports meetings, 85% held a sport day event, and 14% organized a swimming gala event. However, the exact number of participants was not available and it is difficult to determine the impact. Furthermore, only 28% of the secondary schools had developed documented policy on PA. As a result, this indicator was assigned grade C.

Community and the Built Environment: B

Attributes of environment have been shown to be related to children’s PA participation. Considering the differences in physical and cultural environment between Hong Kong and western countries, studies examining environmental correlates on PA are increasing in a recent decade for Chinese children. The indicator of Community and the Built Environment received a grade of B due to various reasons: (1) a high proportion of parents (60-79%) felt that their neighbourhood were safe for their children to be physically active; (2) the majority of youth...
aged 12 yrs or older were satisfied with the sport facilities provided by the government (ranging from 66% for staff services to 95% for location);20 (3) half of youth aged 12-14 yrs and 37.4% of people aged 15-24 yrs had used the sports facilities in their community for at least once during the last year.20 However, the usage and perception of sports facilities provided by private organisations and clubs were unknown for children and youth.

**Government – Strategies, Policies, Investments: INC**

The indicator of Government is difficult to grade due to lack of a definitive benchmark (Table 1). There is some preliminary evidence on the commitment and initiative for the government in providing PA opportunities for all children and youth, however, the exact impact and outcomes are unlikely to be evaluated at this moment. As a result, this indicator received a grade of INC.

The Leisure and Cultural Services Department (LCSD) is responsible for the provision of recreation and sports services in Hong Kong. In recent years, the LCSD has organised a wide range of recreational activities for general public and has made efforts in promoting “Sport for All” in the local community. Specifically, the LCSD has organised School Sports Programmes for students in primary, secondary and special schools to participate in various sport activities during leisure time in schools.36 Anecdotal evidence showed that 1,065 schools and 600,617 students participated in the sports activities under the School Sports Programmes scheme in school year 2009/10.37 A thorough and well-designed evaluation of these sports programmes warrants future attention.

**Strengths and Limitations**
Modeled on the successful framework from various countries, the 2016 Active Healthy Kids Hong Kong Report Card was developed based on the best available evidence from representative samples of children and youth. The grades for the indicators were determined by the RWG with diverse expertise and stakeholders from relevant sectors. Despite this, the grades have to take into consideration the following limitations. Firstly, there was insufficient data on objectively measured PA in children and adolescents. Secondly, the data sources used for assigning grades were collected up to 10 years ago, which may not necessarily reflect current situations. However, the results from the first Report Card provide valuable baseline grades for future comparison. Finally, several indicators (Active Transportation, Family Influence, and School) were assigned a grade based on only one major data source. It highlights the need for additional research addressing the knowledge gaps.

**Conclusion**

The first Hong Kong Report Card shows that PA level is low and sedentary behavior is high for children and youth in Hong Kong. Promising policies exist in schools and features of the community and the built environment are favorable, but lack adequate evaluation on the impact on health behaviors. Improving family support should be emphasized for future PA promotion.

**Acknowledgements**

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   Test for the Community.


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<table>
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<tr>
<th>Indicator</th>
<th>Benchmark</th>
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| Overall Physical Activity Levels | % of children and youth who meet physical activity guidelines of 60 minutes of MVPA daily  
% of preschool children who meet physical activity guidelines of 180 minutes of PA daily |
| Organized Sport Participation | % of children and youth who participate in organized sport for at least once per week |
| Active Play | % of children and youth who participate in non-organized sport for at least once per week |
| Active Transportation | % of children and youth who use active transportation to school for at least once per week |
| Sedentary Behaviors | % of children and youth who meet screen time guideline (< 2 hr/day) |
| Family | % of parents who are physically active with their kids |
| School – PE, PA-related Policy, and Programs | % of schools where the majority of students are offered at least 70 minutes of PE per week  
% of schools with active school policies  
% of school that offer physical activity opportunities (excluding PE) to the majority of their students |
| Community and the Built Environment | % of children or parents living in a safe neighbourhood where they are physically active  
% of children or parents who have used sport facilities in their community  
% of children or parents who are satisfied with parks and sport facilities in their community |
| Government Strategies and Investments | 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 |

PA, physical activity; PE, physical education.
Table 2. Grades According to Physical Activity Indicator in the 2016 Hong Kong Report Card on Physical Activity for Children and Youth

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Grades</th>
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<tbody>
<tr>
<td>Overall Physical Activity Levels</td>
<td>D</td>
</tr>
<tr>
<td>Organized Sport Participation</td>
<td>C–</td>
</tr>
<tr>
<td>Active Play</td>
<td>INC</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>B</td>
</tr>
<tr>
<td>Sedentary Behaviors</td>
<td>C</td>
</tr>
<tr>
<td>Family</td>
<td>D</td>
</tr>
<tr>
<td>School – PE, PA-related Policy, and Programs</td>
<td>C</td>
</tr>
<tr>
<td>Community and the Built Environment</td>
<td>B</td>
</tr>
<tr>
<td>Government Strategies and Investments</td>
<td>INC</td>
</tr>
</tbody>
</table>

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.

PA, physical activity; PE, physical education.
Figure 1: Front Cover of the 2016 Hong Kong Physical Activity Report Card