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

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Title page

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

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Abstract

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

30

31 Key words: exercise, sedentary behavior, adolescent, family support

32

33 Insufficient physical activity (PA) and high levels of sedentary behavior have been well
34 documented as risk factors for cardiometabolic disease.^{1,2} Current public guidelines recommend
35 that children and youth should accumulate at least 60 minutes of moderate to vigorous PA daily
36 and reduce screen-based behavior to not more than 2 hours a day.^{3,4} Despite the compelling
37 evidence on the health benefits of living an active lifestyle, the majority of children and youth in
38 Hong Kong do not meet the recommended PA levels and excessive screen time is one of the
39 public concerns in Hong Kong.⁵ To promote an active lifestyle, a more promising approach is
40 necessary to improve current surveillance data, inform evidence-based strategies, and foster
41 relevant policy development.

42

43 The Active Healthy Kids Hong Kong (<http://activehealthykidshongkong.com.hk/>) was
44 established in 2015 to consolidate the best available evidence on PA behavior in children and
45 youth to drive policy development and guide research strategies. Based on the previous success
46 of Report Cards from various countries,⁶ the first Hong Kong Report Card on Physical Activity
47 for Children and Youth was launched in 2016. This paper aims to present the key findings of the
48 first Hong Kong Report Card on Physical Activity for Children and Youth.

49

50

Methods

51 The 2016 Active Healthy Kids Hong Kong Report Card was produced by a Research Work
52 Group (RWG) consisting of 6 researchers with expertise in PA, physical education (PE), exercise
53 science, and public health from two research-led universities in Hong Kong. The group leader of
54 the RWG was responsible for securing the funding and all members of the RWG were
55 responsible for searching evidence, determining indicators and benchmarks, assigning grades,

56 and disseminating the Report Card. A stakeholder group representing academic, government and
57 non-government sectors (medical doctors, educators, health practitioners, and policy makers)
58 were then informed. The role of the stakeholder group was to: firstly, inform the RWG of any
59 sources of data that were potentially missed; secondly, provide feedback on the initial grades at a
60 half-day meeting or via email communication; and finally, help the RWG disseminating the
61 Report Card to the community.

62

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

- 77 • *Physical Fitness Test for the Community*: This was a territory-wide community fitness
78 survey conducted from April 2011 to January 2012.⁸ This study was commissioned by

79 the Community Sports Committee of Hong Kong and organized by the Leisure and
80 Cultural Services Department. A series of standardized physical fitness tests and
81 questionnaire survey according to National Physical Fitness Test Handbook were
82 performed. Through stratified random sampling method, 8,178 Hong Kong citizens aged
83 3-69 years were recruited. Relevant data for preschoolers (3-6 years, n=584), children (7-
84 12 years, n=2,723), and adolescents (13-19 years, n=2,517) were used for Report Card.

- 85 • *Child Health Survey (CHS) 2005-2006*: CHS was a commissioned project by the
86 Department of Health.⁹ The survey aimed to provide baseline data on health status of
87 children and youth aged 14 years or below in Hong Kong. A total of 7,393 children and
88 youth were surveyed using systematic random sampling. The survey consisted of 6
89 aspects of health-related scopes including diet and PA.
- 90 • *International Physical Activity and the Environment Network (IPEN) Adolescent Study-
91 Hong Kong*: This epidemiological study is part of the IPEN project
92 (<http://www.ipenproject.org/>). It aimed to investigate the associations of environmental,
93 psychosocial and behavioral variables with body mass index in adolescents in Hong
94 Kong. Using a two-stage stratified sampling strategy, 1,363 adolescents (11-18 years)
95 and one of their parents/primary caregivers residing in different types of neighbourhood
96 were recruited. PA and sedentary behavior were measured using both subjective and
97 objective methods. PA-related psychosocial and environmental correlates were surveyed
98 using validated scales.¹⁰
- 99 • *Understanding Children's Activity and Nutrition (UCAN) Study*: The UCAN study was a
100 3-year longitudinal investigation on the determinants of PA and sedentary behavior in
101 Chinese children in Hong Kong. A total of 1,666 grades 1-3 children were initially

102 recruited in 2009 from 24 primary schools varying in social economic status.¹¹ PA and
103 sedentary behavior were assessed by a validated questionnaire¹² and an ActiGraph
104 accelerometer (for subsample only).

- 105 • *Hong Kong Student Obesity Surveillance (HKSOS)*: The HKSOS was a population-based
106 surveillance aiming to monitor trend of childhood obesity and its risk factors.^{13,14} The
107 baseline data collection was conducted in 2006-2007 among 32,005 students from 42
108 randomly selected secondary schools from each of the 18 administrative districts in
109 Hong Kong.¹³ In 2007-2008, follow-up measurements were conducted among 61% of
110 the sample with 9,993 students providing complete information on both time points.¹⁴
111 Exercise (defined as structured physical activities) and non-exercise PA (defined as
112 movement necessary for normal living such as walking for transportation) were assessed
113 by self-reported questions.¹⁵
- 114 • *2005-2006 Hong Kong Growth Survey*: The survey aimed to monitor secular trends in
115 anthropometric features of Hong Kong children and youth aged 6- 18 years.¹⁶ A total of
116 14,842 students were enrolled from randomly selected 18 primary and 18 secondary
117 schools from 18 districts. Self-reported sport participation was only available for
118 adolescents.¹⁷
- 119 • *Youth Survey on Usage of Internet and Social Network Websites*: It was a survey
120 conducted by Public Opinion Programme at the University of Hong Kong in 2010.¹⁸ 825
121 Cantonese speaking youth aged 12-23 years were interviewed through telephone.
- 122 • *Healthier Lifestyle for Primary School Children*: It was a review conducted by the Audit
123 Commission of the Hong Kong Government to examine various school-based
124 programmes pertaining to a healthier lifestyle for primary school children.¹⁹ The audit

125 survey was collected from 426 schools from December 2008 to January 2009 and
126 covered various scopes including school-related PA policy and strategies.

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

135

136 The draft letter grades for the 9 indicators were assigned based on the proportion of children
137 meeting the pre-defined benchmarks (Table 1):²¹ A, 81% – 100%; B, 61% – 80%; C, 41% –
138 60%; D, 21% – 40%; F, 0% – 20%; INC, incomplete data. Grades may be graded down (–) or up
139 (+) based on the presence of disparities in age, gender, socioeconomic status (SES) or on the
140 trends of the behaviors. Factors considered for assigning a grade were representativeness of the
141 sample, quality of the measurement (subjective or objective, validated measures or not), and
142 sampling period. Objective measures of PA or subjective measures with sound methodology
143 (e.g. how the questions were asked and whether they have been validated) took precedence. The
144 RWG met to evaluate the available data source for each indicator and draft grades were assigned
145 once consensus was reached. Draft grades were then discussed and commented by the
146 stakeholder group at a feedback meeting held in May 2016 or through email communication.

147 Final report card grades were finally confirmed and are accessible from the project website
148 <http://activehealthykidshongkong.com.hk>.

149

150

Results

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

154

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

161

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

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

169

170

Discussion**171 Overall Physical Activity Levels: D**

172 The low grade of Overall Physical Activity Levels indicates that less than half of the children
173 and youth in Hong Kong met the daily recommended PA guidelines. It was important to note
174 that disparity existed between self-report and objective measures of PA. Only one study reported
175 overall PA in preschool children and showed that 18% of the young kids spent at least one hour
176 per day in PA.⁸ However, the percentage cannot be generated for meeting the PA
177 recommendation for young kids, i.e. 180 min of PA per day.²² A national survey showed that the
178 self-reported proportion of meeting PA recommendations for school-aged children and
179 adolescents was as low as 10%.⁸ The percentage was slightly higher in boys (9.5%) than in girls
180 (7.0%) for primary school students; while more adolescent boys (12.8%) than girls (4.2%) met
181 the PA recommendation.⁸ Although these data were from the well-established National Physical
182 Fitness Test, a lack of methodologic details made it difficult to evaluate the properties of the
183 questionnaire used in this study. Accelerometer data showed that the percentage ranged from
184 22% to 50%¹¹ for children and nearly 90% for adolescents.²³ The extremely high compliance rate
185 of PA guidelines in adolescents may be partly explained by the high percentage of well-educated
186 parents (80% of the parents with higher secondary school or higher education level).²³
187 Considerably more objective measures of PA are needed for preschool and school-aged children
188 and youth. For existing surveillance surveys, valid and reliable questionnaires should be used
189 and properly reported.

190

191 Organized Sport Participation: C-

192 Data from two citywide surveys showed that 40%-50% of the secondary school students
193 participated in exercise class other than PE outside school.^{14,17} Organized Sport Participation was
194 therefore graded C– due to an apparent lower participation in girls (30%) than that in boys
195 (41%). Since no data are available for children, the grade for this indicator can only be applied to
196 adolescents.

197

198 **Active Play: INC**

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

205

206 **Active Transportation: B**

207 Active travel has been shown to contribute to a significant proportion of overall PA in youth.²⁸
208 Hong Kong is an ultra-dense metropolis. Most districts are highly self-contained and children
209 usually attend schools close to their home.²⁹ The grade of B for active transportation was
210 determined based on a citywide survey for adolescents²³, which showed that 77% of the girls and
211 80% of the boys commuted to school by active modes at least once per week. For primary school
212 students, a recent longitudinal study showed that half of this cohort walked to school regularly.³⁰
213 Furthermore, a change from passive to active travel to school was positively associated with two-

214 year changes in MVPA on weekdays.³⁰ Active transportation to other destinations, however, has
215 not been well investigated in Hong Kong youth.

216

217 **Sedentary Behaviors: C**

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

224

225 **Family Influence: D**

226 Base on a national survey, 49% of preschoolers in Hong Kong participated in PA with their
227 family members for at least once per week.⁸ The proportion declined to 37% for children and
228 23% for adolescents.⁸ The indicator of Family Influence was therefore assigned a grade of D.
229 These findings indicate that parents' influence may decrease while peer influence is becoming
230 more important when children grow up with more autonomy. However, peer influence could not
231 be graded due to insufficient data. A survey study conducted among 303 grades 4-6 students in
232 Hong Kong showed that girls tended to be more physically active if they perceived more support
233 from their peers.³⁴ Future research on peer support of PA from representative sample is needed
234 for Chinese children.

235

236 **School – PE, PA-related Policy, and Programs: C**

237 School plays an important role in promoting PA participation for children and youth. An audit
238 survey conducted in 2009 for primary schools was selected as the major data source to determine
239 the grade of School.¹⁹ Education Bureau (EDB) is a government entity that oversees the
240 implementation of education programmes including PE in Hong Kong. According to the
241 curriculum guide from the EDB, both the primary and secondary schools in Hong Kong should
242 allocate 5% to 8% of the total curriculum time to PE, corresponding to 70 to 120 minutes per
243 week. Based on the audit report, 77% of the responding schools (n=426, 82% response rate)
244 allocated 70-120 minutes of PE lesson per week for the school year 2008/09.¹⁹ However, the
245 actual length of PE lessons was found to be 22% shorter than the scheduled one for secondary
246 school students.³⁵ Sport-related extra-curricular activities were popular for the secondary
247 schools, with 98% of them participated in inter-school sports meetings, 85% held a sport day
248 event, and 14% organized a swimming gala event. However, the exact number of participants
249 was not available and it is difficult to determine the impact. Furthermore, only 28% of the
250 secondary schools had developed documented policy on PA. As a result, this indicator was
251 assigned grade C.

252

253 **Community and the Built Environment: B**

254 Attributes of environment have been shown to be related to children's PA participation.
255 Considering the differences in physical and cultural environment between Hong Kong and
256 western countries, studies examining environmental correlates on PA are increasing in a recent
257 decade for Chinese children. The indicator of Community and the Built Environment received a
258 grade of B due to various reasons: (1) a high proportion of parents (60-79%) felt that their
259 neighbourhood were safe for their children to be physically active;²³ (2) the majority of youth

260 aged 12 yrs or older were satisfied with the sport facilities provided by the government (ranging
261 from 66% for staff services to 95% for location);²⁰ (3) half of youth aged 12-14 yrs and 37.4% of
262 people aged 15-24 yrs had used the sports facilities in their community for at least once during
263 the last year.²⁰ However, the usage and perception of sports facilities provided by private
264 organisations and clubs were unknown for children and youth.

265

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

267 The indicator of Government is difficult to grade due to lack of a definitive benchmark (Table 1).

268 There is some preliminary evidence on the commitment and initiative for the government in
269 providing PA opportunities for all children and youth, however, the exact impact and outcomes
270 are unlikely to be evaluated at this moment. As a result, this indicator received a grade of INC.

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

280

281 **Strengths and Limitations**

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

293

294 **Conclusion**

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

299

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409 Table 1. Benchmarks Used to Guide the Grade Assignment for Indicators in the 2016 Hong
 410 Kong Report Card on Physical Activity for Children and Youth

Indicator	Benchmark
Overall Physical Activity Levels	<ul style="list-style-type: none"> • % 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	<ul style="list-style-type: none"> • % 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	<ul style="list-style-type: none"> • % 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	<ul style="list-style-type: none"> • 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

411 PA, physical activity; PE, physical education.

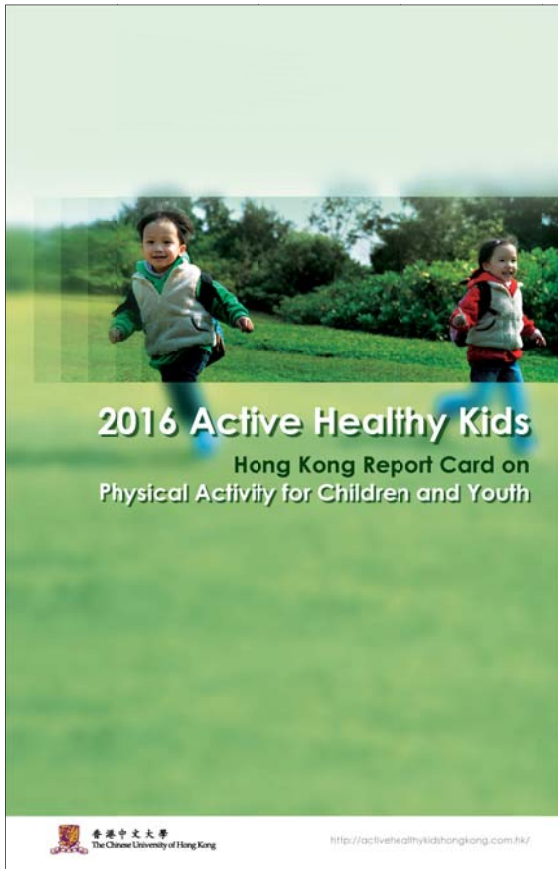
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413 Table 2. Grades According to Physical Activity Indicator in the 2016 Hong Kong Report Card on
 414 Physical Activity for Children and Youth

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

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

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432 Figure 1: Front Cover of the 2016 Hong Kong Physical Activity Report Card