

# Healthy Eating and Active Living: Opportunities and Challenges for Young Children in Boston Chinatown, Massachusetts



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## EXECUTIVE SUMMARY

The 2013 community health assessment was undertaken by the Healthy Chinatown Alliance at the Boston Chinatown Neighborhood Center (BCNC) to assess childhood obesity and pre-obesity among vulnerable Asian American and Native Hawaiian Pacific Islander children and families in Boston Chinatown, and to identify opportunities and barriers to the promotion of healthy eating, physical activity, and healthy living.

For this assessment, community information was collected from two sources: focus group data from directors of early education programs in Boston Chinatown and survey data from parents and caretakers of preschool-age children who attend these programs.

The focus group identified current supportive policies, resources, programs, and environments at early education and care programs that promote healthy eating and healthy activity; as well as practices, barriers and opportunities for improvements. Among the programs' attributes and strengths were the nutrition-conscious changes that directors had already made to meal menus and their implementation of strict food restrictions and/or policies. The two leading concerns identified by the focus group were concern for safety for children playing at public parks and playgrounds and cultural issues perceived as impeding healthy diet and activity.

The survey data from 198 respondents (41% response rate) illustrates that the population of parents and caregivers of preschool-aged children in Chinatown are mostly recent Asian immigrants, with the majority having been living in the U.S. for only 2-6 years. Differences between the Asian and non-Asian survey responses, as well as differences between US- and foreign-born families were observed in food consumption, physical activity participation, feeding habits and perceptions, with children of Asian immigrants at somewhat higher risk of specific less-healthy nutrition and activity behaviors. Based on parent's report of their child's weight and height, the prevalence of overweight and obesity (BMI  $\geq$  85<sup>th</sup> percentile) was high compared with national levels (35% for Asian; 57% for non-Asian compared with 22.8% nationally).

When the two data sources were assessed together, of particular note was the convergence between the responses from the program directors and the survey participants on identifying outdoor physical activity time and opportunities for physical activity as being sub-optimal. Also noted from both sources were particular cultural practices among Chinese immigrant families that present opportunities for training center staff and parent education. While Center directors thought obesity could be an emerging issue among their group of children, survey data suggests that it may already be problematic. Lastly, center directors noted the importance of and underutilization of Chinese-language communications. This observation was reinforced by the fact that more than half of the Asian respondents requested a Chinese version of the survey.

Thus, recommendations from this needs assessment include collaborating with the City of Boston to improve outdoor open and recreational space (safety, access, equipment, etc) in Chinatown, consider early education program staff training on physical activity and culturally humble healthy eating parenting practices, and redouble efforts to make communications linguistically appropriate. Follow-up activities to address some of these issues were quickly undertaken by BCNC and other program directors.

### **Follow-Up Activities since Needs Assessment (As of July 2015)**

A coalition of stakeholders from the Chinatown community, including early education and care providers, social service agencies, higher education, health care providers, and Boston Public Health community met for approximately 12 months (July 2013 – June 2014) to discuss the needs assessment data presented in this report, identify and review other data sources for the Chinatown community, prioritize needs and identify opportunities for action, and identify potential partners for collaboration.

In addition to the broader coalition, the group of early education program directors met regularly for several months to respond to specific concerns raised by the needs assessment. Three of the early education and care programs provided staff training on movement activities for the children in their charge. Although the training to center staff was done in English, a translator was utilized, making the training accessible to all the providers. The program directors' group invited the Massachusetts Early Education and Care licensor to accompany center directors to assess hazards in the local playgrounds, which facilitated at least one playground renovation for the community. In addition, at least one program now allows local neighbors to use the program's playground when the programs are not in session; especially on weekends.

## INTRODUCTION

Though understudied, the Asian community in the United States has historically had lower rates of obesity than the general population and thus has not been the target of obesity prevention efforts.<sup>1, 2</sup> However, recent evidence suggests that obesity levels are rising among Asian immigrants and Asian Americans, and that this group may be at an increased risk for the chronic diseases associated with obesity.<sup>3</sup> Furthermore, acculturation to a more Western diet may bring risk of poor eating habits to recent immigrants to the United States.<sup>4</sup> Research has shown that healthy eating and activity habits are established early in childhood, and thus, along with the opportunity to impact family habits through the child, early childhood is a prime target for obesity prevention efforts in the Asian community.<sup>5, 6</sup>

The Boston Chinatown community has faced challenges in having appropriate data available for assessing the health needs of its Asian-descent residents. Asians make up only about 9% of the population in the city of Boston<sup>7</sup>; and Chinatown-specific data reports are rare, given that the city of Boston often combines community data from residents in both the Chinatown and South End neighborhoods.<sup>8</sup> Because of this, data on Chinatown has often been overlooked or grouped into larger neighborhoods, and the needs specific to this community may have been neglected. This project attempts to address the lack of substantial data and limited research on Asian Americans from Boston Chinatown, especially for young children.

Funded by a grant from the Health Through Action for Children and Families (HTACF) initiative from a national health advocacy organization, the Asian & Pacific Islander American Health Forum (APIAHF), this project seeks to address the needs of Asian American and Native Hawaiian Pacific Islander children and families who are vulnerable to disparities in health, education, socioeconomic status and immigration status. The focus of this project was on understanding any disparities in health, specifically the childhood obesity and pre-obesity and associated health behaviors. The project involved collecting community information to inform current healthy eating and active living policies and programs for Asian American preschool-aged children and their families in Boston Chinatown, and direct planning for future research, resource generation, and program development to promote obesity prevention. EEC centers in the Chinatown area were targeted to reach Asian American preschool-aged children for this project.

A community coalition, the Healthy Chinatown Alliance, was formed to bring in expertise from collaborators in public health, healthcare, and community advocacy to advise and support this effort. Boston Chinatown Neighborhood Center (BCNC) served as the project lead and liaison to the Chinatown community. Tufts University School of Medicine, Department of Public Health was the needs assessment partner. The scope of work was completed in the calendar year of 2013. A participatory research approach that engaged community and academic partners in all aspects of the research was used.

Thus, the goal of this assessment is to provide information about the current practices at EEC licensed centers and to identify major issues or trends in feeding practices and habits of parents/caretakers of preschool children. This information was used to inform a community action plan for the Healthy Chinatown Alliance to address obesity prevention in young children.

## METHODS

*Overall Summary:* Mixed qualitative and quantitative methods were used in the needs assessment. The source of data comes from a focus group of early education center directors from the Chinatown area that serve predominantly Asian children, and a parent questionnaire of eating and physical activity among young children who attend these childcare centers in Chinatown. The project was approved by the Tufts University Institutional Review Board.

*Early Education and Care Center Director Focus Group:* Directors of Chinatown-based childcare centers were invited to participate in a focus group session about barriers that prevented healthy diet and physical activity at their centers and discussion of opportunities for change in policy or resources (see Appendix 1 for focus group question guide). Critical input was obtained from the three-hour focus group held on May 17, 2013 with six EEC center directors. A survey was distributed prior to the focus group session to assess existing policies and practices in place at the centers. Common themes and concerns were identified from the focus group session to prioritize items for the community action plan of the Healthy Chinatown Alliance.

*Parent Survey:* A 36-item questionnaire was created, with questions adapted from previously validated sources<sup>9,10</sup> on factors that were identified in prior research to be crucial and modifiable in the genesis of the obesity problem<sup>11</sup>. The survey included questions on dietary and activity habits, and parental practices of preschool-aged children, (see Appendix 2 for the survey instrument). The survey was translated into Chinese (see Appendix 3), and reviewed by several Chinese-descent parents and child-care staff and the final version was modified based on feedback for cultural appropriateness. Survey distribution occurred on May 20, 2013 at the six early education programs whose directors had earlier participated in the focus group. All parents/ caregivers whose children were enrolled at the early education programs were invited to participate in the survey, and respondents were given a week to return their questionnaires. Survey respondents were entered into a gift card raffle as incentive for their participation.

*Survey Analysis:* The survey data was analyzed for any trends according to respondent demographics, food and activity frequencies, and practices and perceptions. Descriptive statistics and exploratory data analysis were conducted on the survey data. Based on the racial breakdown of study population and the project's focus on the Asian American community, the survey data were stratified into a sub-analysis of Asian-only subjects. Respondents were designated as "Asian" if they identified as Asian in race or if they had responded to the Chinese version of the survey. The Asian subpopulation was categorized into U.S.-born and foreign-born, which were defined by the respondents' nativity in the U.S. or elsewhere. Bivariate analyses were used to assess differences between Asian and Asian-only as well as between U.S.-born Asians and foreign-born Asians. All food and activity frequencies, feeding practices, and perception items were dichotomized into categories appropriate to the question. Weight status was derived from the parent/caregiver's self-reported height and weight of child and converted to BMI percentiles and weight status categories<sup>12</sup> according to the World Health Organization (WHO)<sup>13</sup> and Centers for Disease Control and Prevention (CDC).<sup>14</sup>

Appendix 4 presents detailed descriptions and information on the survey design, instrument, and analyses. Appendix 5 presents tables of food and beverage consumption and parenting patterns by the total sample, and the non-Asian and Asian subsamples.

## RESULTS OF FOCUS GROUP OF CHILDCARE CENTER DIRECTORS

Among the focus group participants, there was consensus that obesity is a rising problem and that healthy eating and physical activity needs to start early in life. Childcare centers in Massachusetts have strict regulations that govern food, feeding, and daily physical activity. As a result of these policies and their awareness of the obesity problem, many of these centers are actively involving parents, staff, and consultants to bring in healthier food and learning opportunities for better eating and activity. Chinese cultural issues and lack of funding were identified as barriers to providing optimal healthy weight promotion practices. Below are the summaries of comments from the focus group participants:

*Among the children in your childcare centers, do you think overweight or obesity is a problem? Why or why not?*

Response Summary: Obesity is an important issue - it is on the rise and will get worse. It is important to start good habits and healthy eating early, so child care centers are important. Participants noted that although most of their children are not obese currently, they acknowledged that many are on their way to having weight issues. Allergies are of big concern for this age group.

*What barriers do you face in providing a healthy diet to children in your healthcare center?*

Response Summary: Participants mentioned that barriers for providing a healthy diet to children in their centers included the expense of healthy food for the center and family issues. Family issues included family's lack of information, culture and food practices such as feeding children before and after child care so that some children do not eat all day and others eat two breakfasts. They also cited that some families set up unhealthy eating behavioral issues that make healthy eating difficult in the center. Solutions included building trust among families and care providers to facilitate co-learning and having more training and curriculum for child care providers.

*What barriers do you face in providing physical activity for children in your center?*

Response Summary: The main barriers cited included: playground issues such as limited suitability of equipment and spaces for infants and toddlers along with safety of the parks, and child care providers discomfort or lack of knowledge on how to best promote quality physical activity. Solutions cited included partnering with Boston Parks and Recreation to work on the playgrounds and training for teachers.

### *Thoughts on family food and feeding practices:*

“Bad habits begin at home: when taken care of by grandparents, kids get whatever they want, or are chased after by parents to get fed.”

“Parental pressure is on teachers for children to finish all food on their plates.”

“Infants over-consume formula because new mothers misread crying for hunger.”

“Parents use food as bribe to influence child behavior – this creates conflict in the center.”

*What enhances/promotes healthy eating and physical activity for children in your center? What are some opportunities for improvement of policies or practices at your center?*

Response Summary: The respondents suggested more training and curriculum for teachers, developing “standards” or policy/practices that they could fall back on when communicating with parents, promoting open communication between providers and parents, utilizing available resources, diversifying the foods that are offered and working on specific issues such as celebration policies or guidelines.

*Who are the partners in Chinatown or in the Boston area who can be helpful in removing barriers or supporting healthy eating and active living?*

Response Summary: Respondents mentioned local community organizations and governmental programs, such as the YMCA and HeadStart in Chinatown and WIC and SNAP, to be potential partners for supporting healthy eating and activity for children and families. Removing language barriers for the Chinatown community by expanding services and resources (e.g. translated educational materials or workshops and having appropriate liaisons) and addressing generational issues such as bridging cultural gaps between Asian Americans and Asian immigrants were identified as important priorities to focus on for this particular community.

*Thoughts on cultural issues:*

“Centers can tell teachers that sometimes it is okay to say “no” to the child or their families who give them pressure, but *sometimes it is not okay that a younger teacher talks back to an elder*”

“Conflicts arise between parents and center teachers about when to feed and what to feed. Parents often say ‘But that’s how we do it at home!’ or ‘That’s the only way they like it!’”

Ideas for promoting healthy eating and active living at childcare centers:

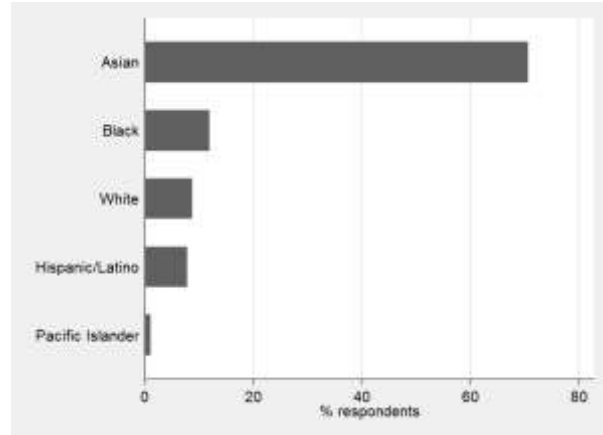
- Introduce interactive activities for children to get them involved in food preparation and to get them eating and trying new things
- Bring children on field trips to grocery stores to help them learn about healthy foods
- Serve varied cuisines to accommodate for diversity and introduce new foods
- Work with the City of Boston to improve playground safety
- Utilize existing space in current centers creatively for physical activity, such as rooftop space

## RESULTS OF PARENT/CARETAKER SURVEY

The parent/caretaker survey recorded responses of dietary and physical activity frequencies, parenting practices, and health perceptions from families that use childcare centers in the Chinatown area. Out of 478 surveys distributed, a total of 198 parents completed the survey, for a response rate of 41%. In total, 104 Chinese surveys and 94 English surveys were returned.

### *Characteristics of Respondents*

Table 1 displays the demographic characteristics of the overall sample and the Asian subpopulation. Respondents in the study were parents or caregivers of children between the ages of 7 months and 8 years. The mean age of the children in the study population was ~4.4 years old, with slightly more than half boys.



**Figure 1. Racial/ethnic composition of the survey respondents (n=198)**

Asians made up 70% of the total survey respondents with 137 respondents. More than a quarter of survey respondents reported residence in the Chinatown area (with a zip code of 02111). Over half of the overall study population receives food assistance such as SNAP or WIC. In the Asian subpopulation, most respondents reported having lived in the US between 2–6 years; only 18% had been born in the United States.

**Table 1. Demographic characteristics of the survey respondents**

Characteristics	Total		Asian		Non-Asian	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Sex of child						
Boys	110	57	76	55	34	60
Girls	84	43	61	45	23	40
Age of child, years	4.4±1.4		4.7±1.3		3.6±1.4	
Receiving SNAP/WIC	115	63	83	64	32	59
Immigration status of parent/caretaker						
Born in US	57	29	18	13	39	68
<2 years	12	6	12	9	0	0
2-6 years	103	53	90	66	13	23
>6 years	22	11	17	12	5	9

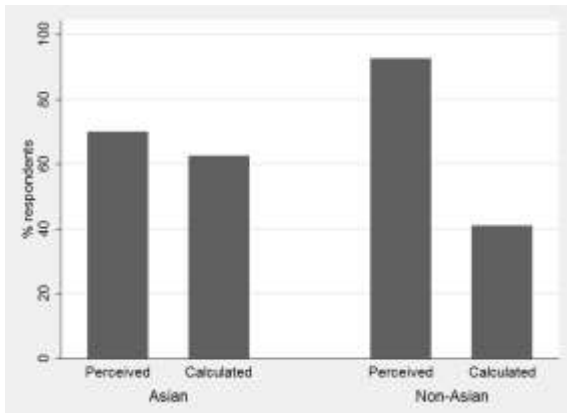
Values are mean ± SD or N, %

SNAP: Supplemental Nutrition Assistance Program

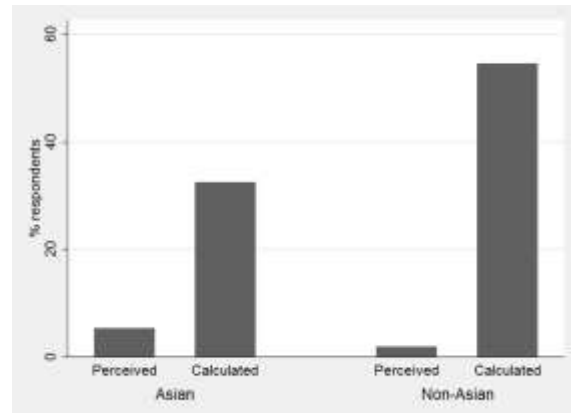
WIC: Special Supplemental Nutrition Program for Women, Infants, and Children



**RESULTS OF PARENT/CAREGIVER SURVEY, cont.**



**Figure 2a: Perceived and calculated “Healthy Weight” status by Asian and non-Asian**



**Figure 2b: Perceived and calculated “Overweight” or “Obese” status by Asian and non-Asian**

Table 2 and Figures 2a and 2b present the distribution of study children’s weight status based on their parent’s classification (“underweight”, “about right”, “a little overweight” or “overweight”) and their Body Mass Index (BMI) calculated from their reported height and weight (underweight, healthy weight, overweight or obese). Based on the calculated weight status, 33% of the Asian and 55% of the non-Asian children in this sample are overweight or obese. The majority of respondents —70% of Asian and 93% of non-Asian—reported their child was “about the right weight” (Figure 2a), and only 5% of Asian and 2% of non-Asian reported their child as “a little overweight” or “overweight”(Figure 2b). However, based on the BMI for age and gender categories (CDC), children were less likely to be of “healthy weight” than parents’ perceived and more likely to be overweight, suggesting a disconnect between parent’s perception of their child’s weight status and the federal classifications of weight status.

**Table 2. Child’s weight status based on parent’s perception and on calculated BMI percentile category classification**

Characteristics	Total		Asian		Non-Asian	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Perceived weight of child <sup>2</sup>						
Underweight <sup>3</sup>	36	19	33	25	3	6
About right	143	76	93	70	50	93
A little Overweight/Overweight	8	4	7	5	1	2
Calculated weight status <sup>1</sup> of child						
Underweight	5	5	4	5	1	5
Healthy weight	59	58	50	63	9	41
Overweight/Obese	38	37	26	33	12	55

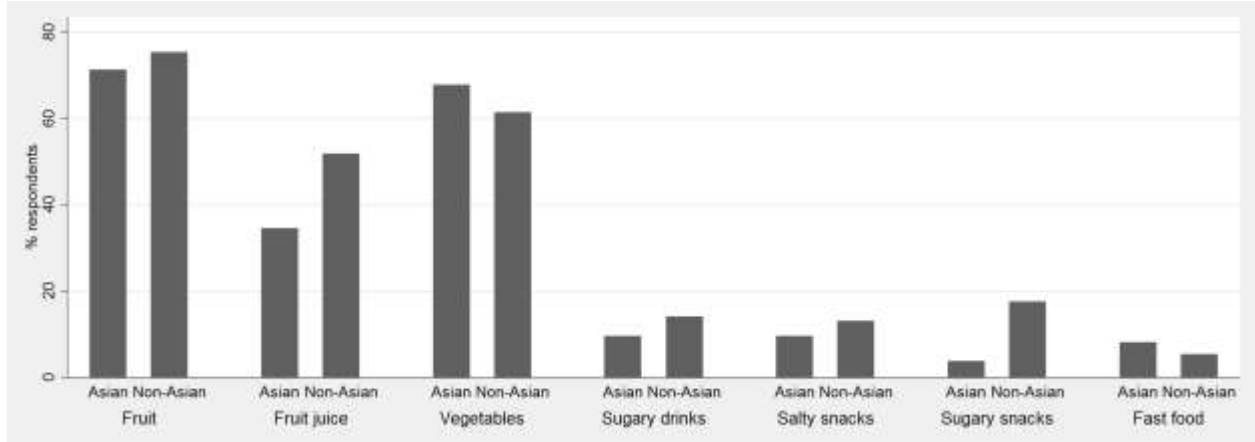
<sup>1</sup>BMI for children are converted into BMI z-scores. Children younger than 2 were excluded from BMI z-score calculation

<sup>2</sup>Perceived weight status for “about right” refers to “Healthy weight” on a standard scale

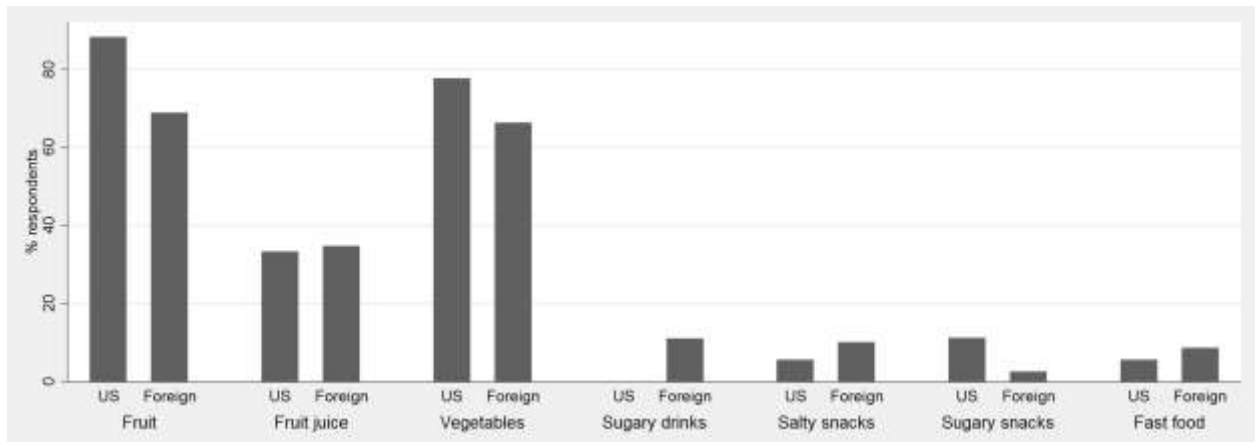
<sup>3</sup>Underweight = BMI less than the 5<sup>th</sup> percentile of gender- and age-specific cut-off points ; Healthy weight = BMI between 5<sup>th</sup> to less than the 85<sup>th</sup> percentile; Overweight = 85<sup>th</sup> to less than the 95<sup>th</sup> percentile; Obese = equal to or greater than the 95<sup>th</sup> percentile.

RESULTS OF PARENT/CAREGIVER SURVEY, cont.

*Dietary and Physical Activity Patterns*



**Figure 3. Reported daily food and beverage consumptions by Asian and non-Asian (n=198)**



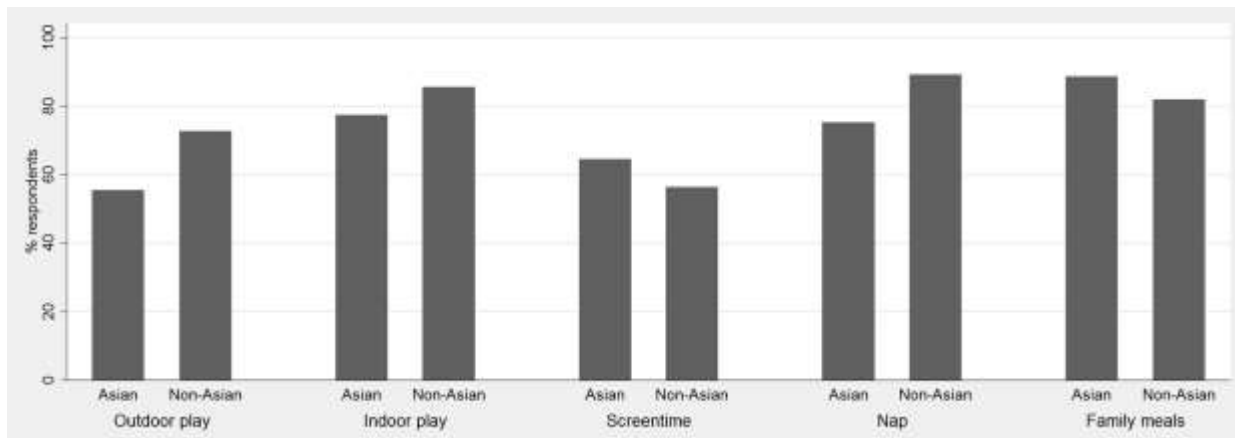
**Figure 4. Reported daily food and beverage consumptions of Asian respondents by US-born and foreign-born (n=137)**

Overall, 73% and 66% of the respondents reported their child eating daily fruits or vegetables, respectively. Non-Asian families were more likely to provide juice and sugary snacks daily (Figure 3).

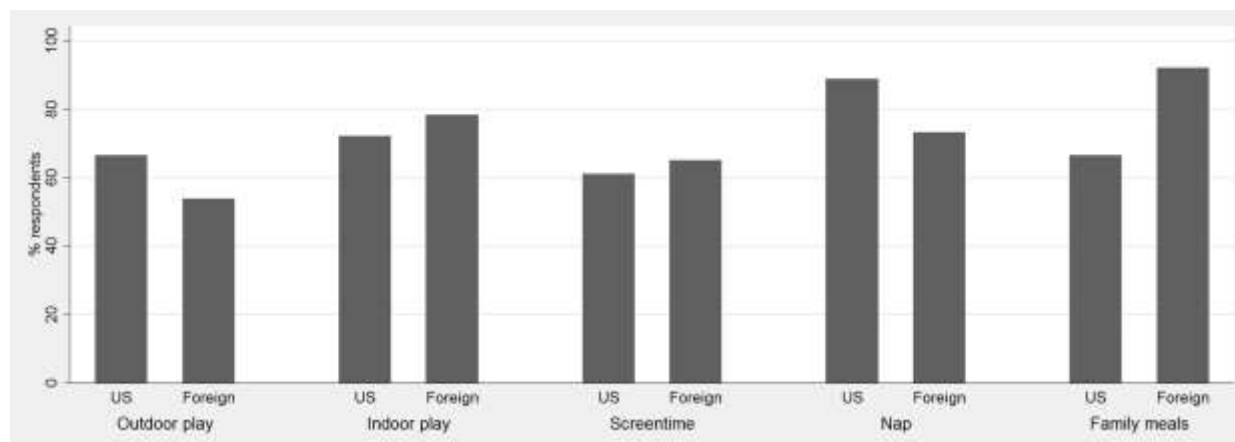
Within the Asian respondents, US-born parents/caretakers reported more daily fruit, vegetable, and sugary snacks while their foreign-born counterparts reported more provision of sugary drinks (Figure 4). However, given the small sample of US-born respondents (18 out of 137) the differences found here might not be conclusive.

RESULTS OF PARENT/CAREGIVER SURVEY, cont.

*Activity Patterns*



**Figure 5. Daily activity participation by Asian and non-Asian (n=198)**

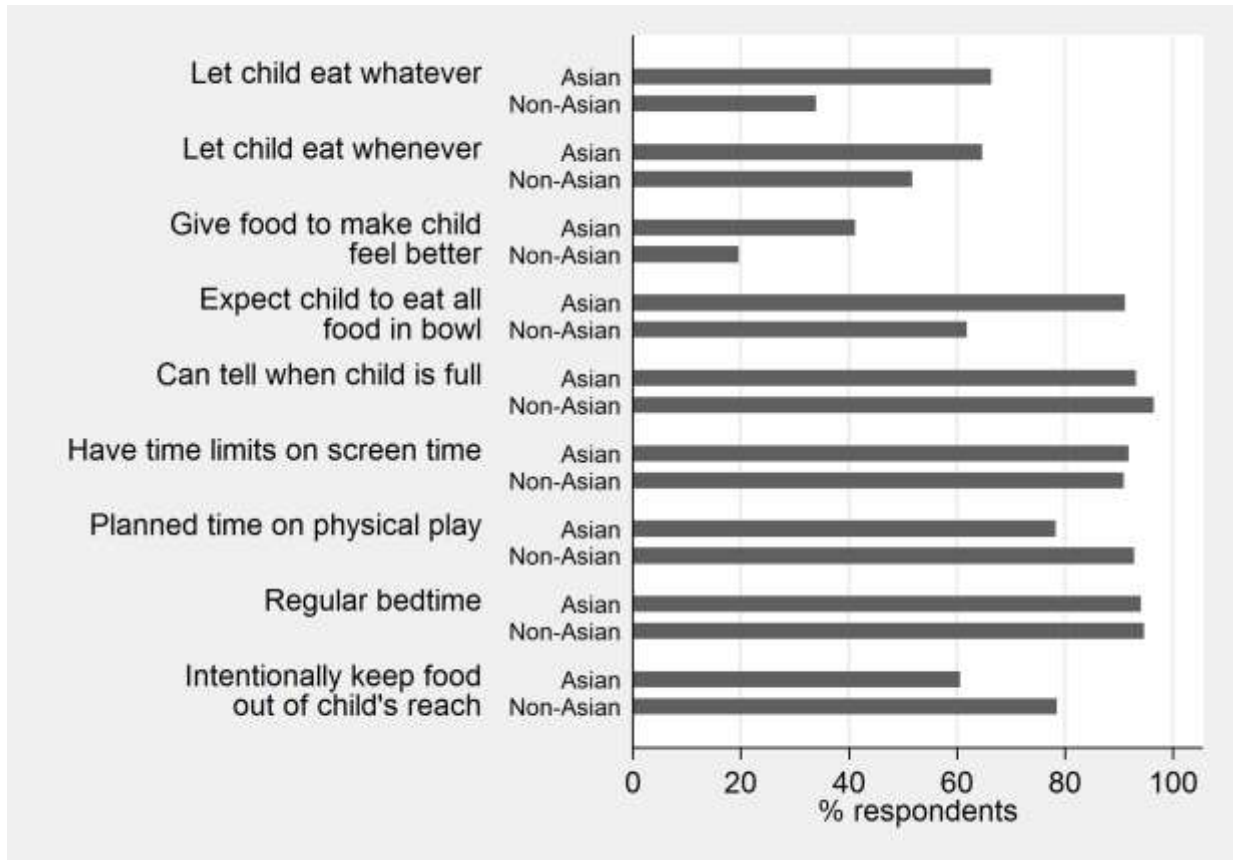


**Figure 6. Daily activity participation among Asian respondents by US-born and foreign-born (n=137)**

Overall, only 60% of parents reported that their child engaged in daily outdoor play and over half of the children watched television daily (appendix 5). Non-Asian families were more likely to provide daily outdoor play and a daily nap (Figure 5). Among Asian families (Figure 6), US-born families were significantly more likely to provide family meals daily.

RESULTS OF PARENT/CAREGIVER SURVEY, cont.

*Family Food/Dietary Practices and Habits*



**Figure 7. Respondents reporting “Always” and “Sometimes” to the feeding habit and perception statements by Asian and Non-Asian (n=198)**

At least 80% of the respondents answered positively to statements pertaining to controlling practices (planning time for screen time, play time, and bedtime) and recognizing hunger and satiety cues (Appendix 5). Compared with the non-Asian respondents, Asian families were significantly more likely to report “I let my child eat whatever he or she wants”, “I give my child something to eat to make him or her feel better when he or she is upset”, and “I expect my child to eat all the food I his or her bowl”. Non-Asian families were significantly more likely to report “I plan time into my child’s schedule for physical play” and “I intentionally keep some foods out of my child’s reach”. Foreign-born Asian families, compared with US-born Asian families, were statistically more likely to report “I let my child eat whenever he or she wants”, “I expect my child to eat all the food I his or her bowl”. US-born Asian families were more likely to report “I plan time into my child’s schedule for physical play”.

RESULTS OF PARENT/CAREGIVER SURVEY, cont.

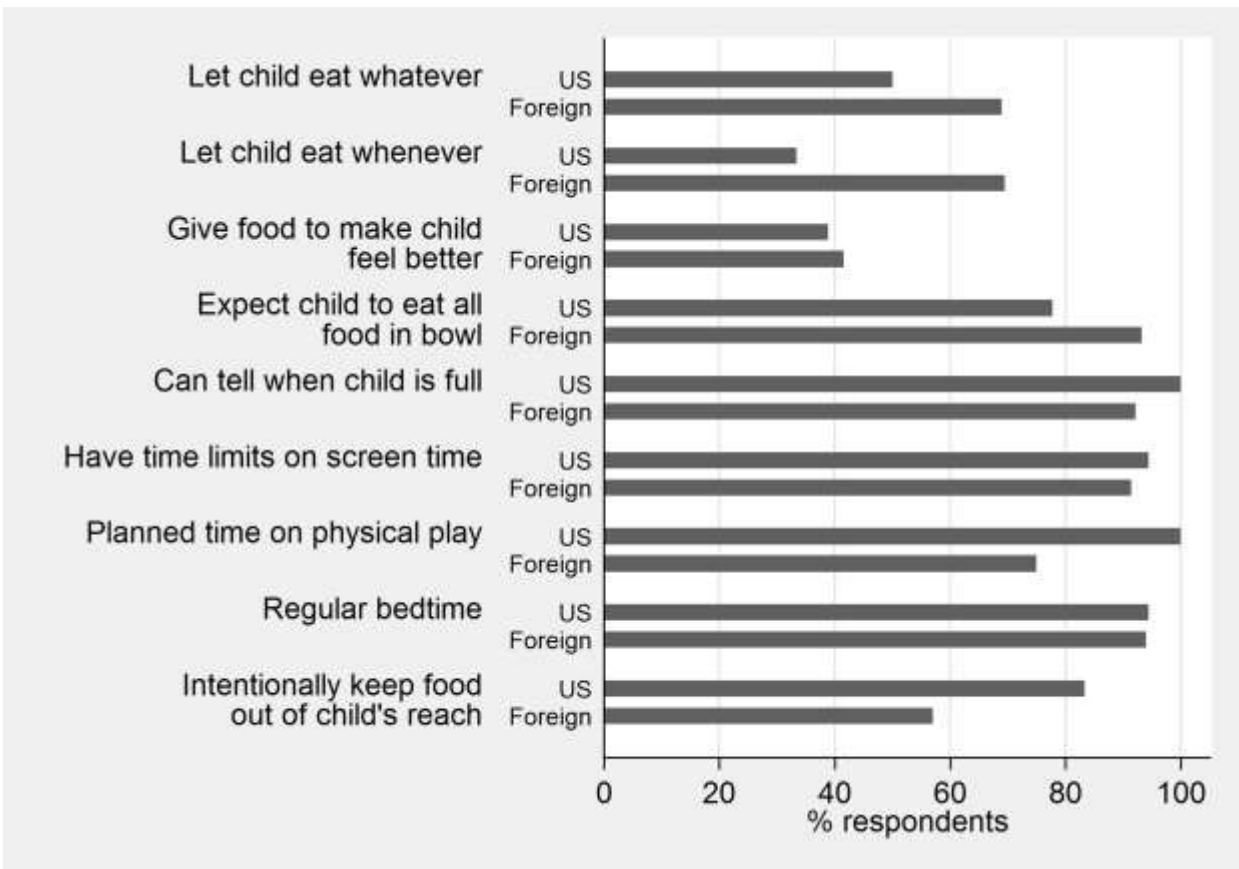


Figure 7. Asian respondents reporting “Always” and “Sometimes” to the feeding habit and perception statements by US-born and foreign-born (n=137)

*Environmental Barriers and Enablers to healthy eating and active living*

Of the potential barriers to healthy eating and active living that respondents could respond to (see appendix 5 for full list): 63% reported worrying about safety when their child plays outside or goes to the park; 10% reported healthy food was too expensive; 67% reported healthy food was available near their house; 83% reported that their child’s caretaker makes sure their child gets exercise and healthy food; and 77% felt confident talking to their child about healthy eating. Non-Asian respondents were more likely to feel confident about talking to their child about healthy eating than did Asian respondents; and among the Asian respondents, the US-born families reported higher confidence in discussing healthy eating than did the foreign-born respondents (100% versus 67%), respectively.

## CONCLUSIONS

Almost 200 parents of children in Boston Chinatown-based early education and care centers responded to a survey on healthy eating, physical activity, and parenting behaviors, representing 41% of the families in the six centers surveyed. Seventy percent of the sample was of Asian descent, (predominantly Chinese) and the majority were relatively recent immigrants (2-6 years) to the US. The majority of the respondents (both Asian and non-Asian) received food assistance, either WIC and / or SNAP. The non-Asian respondents were very diverse, including white, African-American, and Hispanic, and other families.

Based on the calculated weight status of the pre-school aged children, 33% of the Asian and 55% of the non-Asian children in this sample are overweight or obese (BMI  $\geq$ 85<sup>th</sup> percentile), which is high compared with national data for this age-range, 9.0% and 22.8% respectively<sup>15</sup>. In addition, parents generally perceived their children to be of healthy weight. Given that the rates of overweight/obesity were based on the parent's report of their child's weight and height – information that is known to be relatively inaccurate – we cannot conclude that Chinatown children are disproportionately overweight. However, both the high rates of overweight/obesity and the high level of disconnect between calculated and perceived weight status suggests that more investigation is in order, since the health consequences of overweight during even early childhood are high. Obesity tends to tract into adulthood and predispose individuals to chronic diseases in adulthood and social discrimination and other health conditions in childhood.

Overall, the majority of the children in the sample are eating healthy foods (fruits and vegetables) daily, and eating/drinking sugary drinks (except for juices) and snacks, salty snacks, and fast food infrequently. The majority is also on a daily basis, eating family meals, napping, and getting playtime indoors or outdoors. However, about half of the children are watching television or engaged in other screen activities daily. These findings suggest that while the children's diets generally appear quite good, there is room for improvement in promoting fruits and vegetables since national recommendations suggest children should be eating 5-8 servings of fruits and vegetables daily. In addition, reinforcing healthy habits that restrict sweet drinks and sweet and salty snacks are recommended, given that they are generally energy-dense and nutrient-poor and habits developed in early childhood may establish life-long eating patterns.

Foreign-born Asian respondents appeared to be at somewhat higher risk of poorer nutrition– a higher percentage of families reported daily consumption of sugary drinks, salty snacks, and fast food items than their US born Asian peers. Children of foreign-born respondents were also less likely to have daily outdoor playtime or regular naps, but did experience more frequent daily family meals than did children of US-born respondents.

The one environmental concern mentioned by a majority of respondents that could be a possible barrier to healthy living behaviors, was concern about safety when their child plays outside or goes to the park. Given the dense, urban setting and lack of open space or other play space in Chinatown, this observation makes sense. This is in contrast to the plethora of food purchasing venues in Boston Chinatown, which frequently display fruits and vegetables generally, and Chinese/Asian fruits and vegetables specifically.

There were some significant differences in parenting styles observed between the ethnic/racial groups. The Asian families generally, and the foreign-born families specifically, reported more “unrestricted” or “indulgent” feeding practices such as allowing child to eat whatever they want, whenever they want, as well as expecting children to finish the food in their bowl. Further research is needed to understand if there is any impact of differential parenting styles of Asian-descent families on feeding and physical activity patterns or weight status. Understanding different parenting styles is important for child educators and care providers to help establish trust and rapport with parents; parents should understand the range of parenting patterns and their relationship to establishing healthy behaviors in their children.

### **Recommendations**

When assessed together, of note was the convergence between the center directors and the survey on identifying outdoor physical activity time and opportunities for physical activity as being sub-optimal. Also noted from both sources were particular cultural practices among Chinese immigrant families that present opportunities for training center staff and for parent education. While Center directors thought obesity may be an emerging issue among their group of children, survey data suggests that it may already be problematic. Lastly, center directors noted the importance of and underutilization of Chinese-language communications. This observation was reinforced by the fact that more than half of the Asian respondents requested a Chinese version of the survey.

Thus, recommendations from this needs assessment include:

- Collaboration with the City of Boston to improve outdoor open and recreational space in Chinatown (safety, access, equipment, etc),
- Consider expanded trainings in Chinese at licensed centers and redouble efforts to make communications linguistically appropriate.
- Consider early education program staff training on physical activity and culturally-humble healthy eating parenting practices.

For future research in this population, it will be important to fine-tune the survey design noted in the limitations (appendix 5) to increase sample size and representativeness and to objectively measure height and weight. A potential research project could be built upon the foundation of this pilot survey, such as expanding to home-based childcare services, and to include other ethnicities in addition to the Chinese population, such as the Vietnamese community in Dorchester or the Cambodian community in Lynn.

## REFERENCES

1. Jain, A., Mitchell, S., Chirumamilla, R., Zhang, J., Horn, I. B., Lewin, A., & Huang, Z. J. (2012). Prevalence of obesity among young Asian American children. *Childhood Obesity*, 8(6), 518-525. doi:10.1089/chi.2011.0077
2. Nam, S. (2013). Obesity and Asian Americans in the United States: a systematic literature review. *Osong Public Health and Research Perspectives*, 6(1). <http://dx.doi.org/10.1016/j.phrp.2013.06.001>
3. U.S. Census Bureau. (2002). The Asian population, 2000. Retrieved from <http://www.census.gov/prod/2002pubs/c2kbr01-16.pdf>
4. Wang, S., Quan, J., Kanaya, A. M., & Fernandez, A. (2011). Asian Americans and obesity in California: a protective effect of biculturalism. *Journal of Immigrant Minority Health*, 13(1): 276-283.
5. Larson, N., Ward, D., Neelon, S. B., & Story, M. (2011). Preventing obesity among preschool children: How can child-care settings promote healthy eating and physical activity? *Robert Wood Johnson Foundation*. Retrieved from <http://www.rwjf.org/content/dam/farm/reports/reports/2011/rwjf71500>
6. Asian Outlook. (2008). *Obesity threatens the future of all Asian youth*. Retrieved from [http://www.asianpacificfund.org/files/AsianOutlook2008\\_ChildhoodObesity.pdf](http://www.asianpacificfund.org/files/AsianOutlook2008_ChildhoodObesity.pdf)
7. U.S. Census Bureau. (2010). State and county quickfacts. Retrieved from <http://quickfacts.census.gov/qfd/states/25/2507000.html>.
8. Health of Boston 2011, Boston Public Health Commission Research and Evaluation Office, Boston, Massachusetts.
9. Cao, Y.T., Svensson, V., Marcus, C., Zhang, J., Zhang, J.D. & Sobko, T. (2012). Eating behaviour patterns in Chinese children aged 12-18 months and association with relative weight - factorial validation of the Children's Eating Behaviour Questionnaire. *International Journal of Behavioral Nutrition & Physical Activity*, 9(5):1-7.
10. Shan, X. (2010). Influences of parents' feeding practices on child's weight status among Chinese adolescents in Beijing, China: a dissertation.
11. Dattilo, A. M., Birch, L., Krebs, N. F., Lake, A., Taveras, E. M., & Saavedra, J. M. (2012). Need for early interventions in the prevention of pediatric overweight: a review and upcoming directions. *Journal of Obesity*, 2012(1): 1-18. <http://dx.doi.org/10.1155/2012/123023>
12. Wang, Y., & Chen, H. J. (2012). Use of percentiles and z-scores in anthropometry. In V. R. Preedy (Ed.), *Handbook of anthropometry: Physical measures of human form in health and disease* (29-48). Baltimore, MD: Springer Science+Business Media.
13. World Health Organization. (2014). WHO Child growth standards. [STATA igrowup package]. Available from <http://www.who.int/childgrowth/software/en/>.
14. Centers for Disease Control. (2013). About BMI for Children and Teens. Retrieved from [http://www.cdc.gov/healthyweight/assessing/bmi/childrens\\_bmi/about\\_childrens\\_bmi.html](http://www.cdc.gov/healthyweight/assessing/bmi/childrens_bmi/about_childrens_bmi.html).
15. Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of obesity and trends in body mass index among US children and adolescents, 1999-2010. *JAMA*. Feb 1; 2012 307(5):483-490. [PubMed:22253364]



## PPENDIX 1 – FOCUS GROUP GUIDE

### **Boston Chinatown Childcare providers**

The questions for this focus group may vary somewhat during the meeting.

#### **Introduction:**

Thank you for coming to this focus group today. The Healthy Chinatown project is an effort that could benefit all of us with resources, policies and programs and the data is key for writing grants and planning programs and policies. *[Optional introduction: As you probably know, the Asian American community typically has lower obesity levels than the general population, but that may be changing. Acculturation to a more western diet brings risk of poor eating habits to recent immigrants to the United States, and evidence suggests that Asians may be at increased risk of obesity-related diseases like diabetes. Obesity prevention is key]*

**In this meeting, we are asking you all to reflect on the how childcare settings can help support healthy weight, healthy eating, and active living and any problems that you see.**

1. Among the children in your childcare centers, do you think overweight or obesity is a problem?  
Why or why not?
2. What barriers do you face in providing a healthy diet to children in your childcare center?  
Prompt – family issues, environmental issues (access to healthy food, expense of food) issues at childcare centers
3. What barriers do you face in providing physical activity for children in center? Prompt: (safety of parks, weather, attitudes?)
4. What enhances or promotes healthy eating and Phys act for the children in your center?
5. What are some opportunities for policies or practices at your center for improving support of HEAL
6. Who are the partners in Chinatown or in the Boston area who can be helpful in removing barriers or supporting HEAL?

We will be putting together a Boston community coalition for healthy children. What are the priorities that you think this group should work on?

APPENDIX 2 – PARENT/CAREGIVER SURVEY: ENGLISH VERSION (1 of 3)

<b>Family Health Survey</b>	
1. I am the child's ____: <i>(Choose one answer)</i> <input type="checkbox"/> Mother <input type="checkbox"/> Father <input type="checkbox"/> Grandparent <input type="checkbox"/> Other: _____	2. I have been living in the United States for: <input type="checkbox"/> Less than 2 years <input type="checkbox"/> More than 6 years <input type="checkbox"/> 2-6 years <input type="checkbox"/> I was born in the U.S.
3. I describe myself as ____: <i>(Check all that apply)</i> <input type="checkbox"/> Hispanic or Latino <input type="checkbox"/> White <input type="checkbox"/> Black or African American <input type="checkbox"/> Asian <input type="checkbox"/> Native Hawaiian or other Pacific Islander <input type="checkbox"/> American Indian or Alaska Native	4. The main language I speak at home is: <i>(Check all that apply)</i> <input type="checkbox"/> Cantonese <input type="checkbox"/> Haitian Creole <input type="checkbox"/> Mandarin <input type="checkbox"/> Spanish <input type="checkbox"/> Toisanese <input type="checkbox"/> Portuguese <input type="checkbox"/> English <input type="checkbox"/> Other: _____
5. My child's birthday is: ____/____/____ <i>(MM/DD/YYYY)</i>	6. My zip code is: _____
7. My child is: <input type="checkbox"/> Male <input type="checkbox"/> Female	8. My child is: <input type="checkbox"/> Underweight <input type="checkbox"/> About the right weight <input type="checkbox"/> A little overweight <input type="checkbox"/> Overweight <input type="checkbox"/> I don't know

<b>A. In an <u>average week</u>, how often does your child eat or drink a serving of the following items? Please include food served at home, daycare, and/or other regular care.</b>					
<i>Please check one option for each question:</i>	<b>More than once a day</b>	<b>About once a day</b>	<b>Several times a week</b>	<b>About once a week</b>	<b>Rarely or never</b>
1. Fruit (bananas, oranges, mangos, apples)...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Fruit juice (orange juice, pineapple juice)...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Cooked or raw vegetables (green beans, spinach, broccoli, peas, bok choy, Chinese broccoli, Yam, bean sprouts salad, cut vegetables)...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Sugary drinks (soda, fruit drinks, sweet tea, Vitasoy, yogurt drinks)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Salty snack foods (potato chips, peanuts, preserved fruit and vegetables)...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Sugary snack foods (cakes, cookies, pastries, tofu pudding, mango mousse, red bean soup)...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. "Fast foods" or Take-out (McDonalds, Dunkin Donuts, chicken wings, dumplings, fried rice)...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**APPENDIX 2 – PARENT/CAREGIVER SURVEY: ENGLISH VERSION**

*(continued – 2)*

<b>B. In an <u>average week</u>, how often does your child do the following? Please include activities at home, daycare, and/or other regular care.</b>					
<i>Please check one option for each question:</i>	<b>More than once a day</b>	<b>About once a day</b>	<b>Several times a week</b>	<b>About once a week</b>	<b>Rarely or never</b>
8. Play actively outside	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Play actively inside	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Watch TV or play video/computer games	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Take a nap	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Eat together as a family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>C. Please select the answer that best represents your rules and habits with your child.</b>				
<i>Please check one option for each question:</i>	<b>Never</b>	<b>Rarely</b>	<b>Sometimes</b>	<b>Almost Always</b>
13. I let my child eat whatever he or she wants.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. I let my child eat whenever he or she wants.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. I let my child take the amount of food that he or she wants.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. I give my child something to eat to make him or her feel better when he or she is upset.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. I encourage my child to try foods that he or she hasn't tasted before.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. I expect my child to eat all the food in his or her bowl.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. I give my child a food reward for good behavior.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. I can tell when my child is full.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. I try to make sure my child is full.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. I set time limits on TV watching, computer & video games for my child.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX 2 – PARENT/CAREGIVER SURVEY: ENGLISH VERSION

*(continued – 3)*

<b>C. Please select the answer that best represents your rules and habits with your child (continued)</b>				
<i>Please check one option for each question:</i>	<b>Never</b>	<b>Rarely</b>	<b>Sometimes</b>	<b>Almost Always</b>
23. I plan time into my child's schedule for physical play.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. My child has a regular bedtime.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. I am influenced by opinions of others about how to feed my child.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. I intentionally keep some foods out of my child's reach.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>D. Please rate each of the following:</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
27. I worry about safety when I let my child play outside or go to the park.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Healthy food is too expensive for my family.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. I can buy healthy foods near my house.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. My child's babysitter/caretaker makes sure to feed my child healthy food.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. My child's babysitter/caretaker makes sure my child gets lots of exercise.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. I feel confident talking to my child about healthy eating.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

33. About how much does your child weigh? _____ pounds	34. About how tall is your child? _____ inches
35. For medical care, I usually take my child to: <input type="checkbox"/> Family doctor or pediatrician <input type="checkbox"/> Tufts Medical Center <input type="checkbox"/> South Cove Community Health Center <input type="checkbox"/> Other: _____ <input type="checkbox"/> I do not have a regular doctor for my child	36. Do you use any of the following to help provide food for your family? <i>(Choose all that apply)</i> <input type="checkbox"/> SNAP (Food stamps or food programs) <input type="checkbox"/> WIC (Women Infant Children program) <input type="checkbox"/> Food pantry or food bank <input type="checkbox"/> None of the above

APPENDIX 3 – PARENT/CAREGIVER SURVEY: CHINESE VERSION (1 of 3)

<b>家庭健康调查</b>	
1. 我是孩子的_____ <input type="checkbox"/> 母亲 <input type="checkbox"/> 父亲 <input type="checkbox"/> 外公, 外婆 / 爷爷, 奶奶 <input type="checkbox"/> 其他人	2. 我居住在美国的时间有: <input type="checkbox"/> 小于两年 <input type="checkbox"/> 大于六年 <input type="checkbox"/> 两年到六年 <input type="checkbox"/> 我在美国出生并且长大
3. 孩子的生日是: ____ 年 ____ 月 ____ 日	4. 我的邮政编码是: _____
5. 孩子的性别是: <input type="checkbox"/> 男 <input type="checkbox"/> 女	6. 我平常在家说: <input type="checkbox"/> 广东话 <input type="checkbox"/> 普通话 (可以多选) <input type="checkbox"/> 台山话 <input type="checkbox"/> 英语
7. 孩子现在是: <input type="checkbox"/> 有点瘦 <input type="checkbox"/> 不瘦不胖 <input type="checkbox"/> 有点胖 <input type="checkbox"/> 非常胖 <input type="checkbox"/> 不知道	

<b>A. 平均一周你的孩子多常会吃或喝以下列项目? 请包括食物供应在家, 托儿所, 和其他定期护理.</b>					
<i>每题请只选一项:</i>	一天几次	一天一次	一周几次	一周一次	偶尔吃或从不吃
1. 水果 (像香蕉, 橙子, 芒果, 苹果等等)	□	□	□	□	□
2. 果汁 (像橙汁)	□	□	□	□	□
3. 煮熟的蔬菜 (像豆角, 菠菜, 青豆, 白菜, 芥蓝, 甘薯, 豆芽菜等)	□	□	□	□	□
4. 生蔬菜 (像蔬菜沙拉, 小胡萝卜等)	□	□	□	□	□
5. 含糖饮料 (像可乐, 果味饮料, 甜茶, 维他奶, 养乐多等)	□	□	□	□	□
6. 咸零食 (像薯片, 花生豆等)	□	□	□	□	□
7. 甜零食 (像蛋糕, 饼干, 豆腐花, 芒果慕斯, 红豆汤等)	□	□	□	□	□

APPENDIX 3 – PARENT/CAREGIVER SURVEY: CHINESE VERSION (continued – 2)

**B. 平均一周你的孩子多常做以下活动？ 请包括活动在家，托儿所，和其他定期护理。**

每题请只选一项：	一天几次	一天一次	一周几次	一周一次	偶尔吃 或从不吃
8. 户外活动	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. 看电视或玩儿电脑游戏	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. 室内活动	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. 打盹儿/小睡	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. 和一家人一起吃饭	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**C. 请选择最能代表你和你孩子的相处方式的答案。**

每题请只选一项	从不	偶尔	有时	总是
13. 我允许我的孩子吃任何他/她想吃的食物	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. 当他/她要求的时候，我会给我的孩子吃的	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. 我让我的孩子决定他/她想吃多少	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. 当我的孩子难过的时候，我用食物安慰他/她	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. 我鼓励我的孩子尝试没吃过的食物	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. 我告诉我的孩子要吃干净碗里的饭菜	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. 我用食物作为奖励	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. 我很清楚我的孩子什么时候吃饱	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. 我努力确保我的孩子有吃饱	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. 我限制我的孩子看电视和玩儿电脑游戏的时间	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. 我给我的孩子安排体育活动	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. 我的孩子睡觉时间很规律	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. 别人的意见会影响我给我孩子吃的东西	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. 我把食物藏在我的孩子够不到的地方	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX 3 – PARENT/CAREGIVER SURVEY: CHINESE VERSION (continued – 3)

D. 请问您同意以下观点吗?	强烈反对	反对	持中立态度	同意	非常同意
27. 我的孩子在户外玩耍的时候, 我很担心他/她的安全	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. 我的家庭负担不起健康的食物	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. 我家附近有卖健康的食物	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. 我家的保姆/幼儿园的老师会保证我的孩子吃得健康	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. 我家的保姆/幼儿园的老师会保证我的孩子经常运动	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. 和我的孩子讨论有关健康饮食的话题, 我感觉比较自信	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1. 你的孩子体重大概有多少? _____ 磅	2. 你的孩子大概有多高? _____ 英寸
3. 医疗方面, 我通常带我的孩子: <input type="checkbox"/> 家庭医生或小儿科医生 <input type="checkbox"/> 塔夫茨医疗中心 <input type="checkbox"/> 華人醫務中心 <input type="checkbox"/> 我的孩子没有固定的医生 <input type="checkbox"/> 其它: _____	4. 你有否使用以下任何一样? (可以多选) <input type="checkbox"/> SNAP (糧食券福利) <input type="checkbox"/> WIC (妇孺营养补助计划) <input type="checkbox"/> 食物银行 (Ricesticks and Tea) <input type="checkbox"/> 没有

## APPENDIX 4 – DETAILED METHODS FOR SURVEY DESIGN, INSTRUMENT, AND ANALYSIS (1 of 2)

### *Study Design and Sample*

The six early education and care (EEC) centers situated in Boston Chinatown provided the sample frame for the parent survey. EEC center directors were invited by staff from Boston Chinatown Neighborhood Council (BCNC) to participate in the needs assessment activities. All sites agreed to participate. Center staff distributed the surveys to all parents / caregivers of children; parents were offered questionnaires in English and / or Chinese. Parents/caregivers were asked to return the completed surveys. Raffles were held at each center to increase responses.

### *Survey Instrument Items*

The parent/caregiver survey was designed to assess healthy eating and active living behaviors among Chinese-descent pre-school aged children and parent feeding practices and environmental factors that may prevent or promote healthy living. The survey covered research domains of feeding patterns, dietary habits, and parental feeding practices that have been identified in the literature to be modifiable factors in the potential genesis of the obesity problem.<sup>11</sup> The domains included the following areas of interest: diet quality and quantity (e.g., fruit and vegetable consumption, intake of “junk food” and sweetened beverages), parent feeding practices (e.g., attention to hunger and satiety cues, use of rewarding or controlling feeding practices), television or computer screen time, physical activity or inactivity time, sleep duration, and shared family meals. In addition, the survey assessed the child’s demographics (age, sex) and respondent’s length of time in the United States and home language, parents report of their child’s height and weight and their perception of weight status, an estimate of socio-economic status (whether or not the family received WIC and/or SNAP benefits), and perceptions of environmental barriers access and care. The final survey contained 36 items with questions adapted from previously validated and reliable instruments.<sup>9,10</sup> (Appendix 2) The survey instrument was translated into Chinese and then back-translated to check for clarity (Appendix 3).

Questionnaire Items: Food consumption was measured in a 7-item food frequency questionnaire using the question “*In an average week, how often does your child eat or drink a serving of the following items?*” Activity participation assessed 5 different activity items, such as playing outside, watching television, and having family meals with the question “*In an average week, how often does your child do the following?*” Respondents were given the following response items for food and activity frequencies: “more than once a day,” “daily,” “few times a week,” “once a week” and “rarely/never” for seven food items. Assessment of parental use of rules and habits contained 14 statements regarding feeding practices (controlling or permissive), attention to satiety cues, and activity rules, to which respondents marked “never,” “rarely,” “sometimes,” or “almost always.” For perceptions of access and care, respondents were given 6 items that assessed agreement or disagreement on having anxiety about having access to healthy food and safety of children when playing outside. Some of the survey questions were tailored to consider for cultural appropriateness for the intended respondent population. For example, certain food items listed under the food frequency portion are those typically found in the diet of Asian



families or can be bought in Asian supermarkets (e.g., cooked vegetables, mango mousse, Vitasoy, etc.).

### *Measures and Analytic Strategy*

The objective of the data analysis was to describe healthy eating and active living behaviors, as well as parenting behaviors associated with obesity (ref) by race/ethnicity and immigration status. An exploratory data analysis was conducted to obtain frequencies and proportion of responses for characteristics of the study population. The study population was analyzed in two ways: the first was to evaluate differences between respondents who identified as Asian and those who identified as non-Asian; the second was to observe differences within the Asian-only subpopulation by immigration status. Respondents were designated as “Asian” if they identified as Asian in the race question or if they had responded to the Chinese version of the survey. The Asian subpopulation was categorized into two immigration status categories of U.S.-born and foreign-born, with immigration status defined as the respondents’ nativity in the United States or elsewhere, as suggested by number of years lived in the States. The foreign-born group was further categorized by years lived in the U.S. for <2 years, 2-6 years, and >6 years. Statistical comparisons were made using the chi-square test or independent samples t-test where appropriate.

Respondents’ self-reported weight and height of their children were used to calculate BMI (weight [kg]/height [m<sup>2</sup>]) and subsequently converted into BMI z-scores according to the WHO international guidelines for standardizing anthropometric measures in children.<sup>13</sup> The BMI z-scores were designated into underweight, normal, overweight, or obese using appropriate percentile groupings.<sup>12,14</sup> All food and activity frequencies, feeding practices, and perception items were dichotomized into categories of daily or weekly, always/sometimes or rarely/never, and agree or disagree, respectively. Any responses that were missing or refused for measures of interest were set to missing and excluded from analysis. Statistical significance was determined by the standardized alpha of  $p < 0.05$ . The data was analyzed using STATA, version 12 (StataCorp, College Station, Texas).

### Limitations and strengths

Respondents are very diverse – strength however respondents represent a mixture of Chinatown residents and other Boston-area residents, diverse Asian and non-Asian residents, thus there are small cell sizes for all racial/ethnic groups other than Chinese, which inhibits cross-racial/ethnic comparisons.

The respondents are a convenience sample and thus we cannot be assured that they are representative of all the families that attend the child care centers in Boston Chinatown. In fact, it is likely that the responding families are more organized and deliberate, a parenting style associated with healthier eating and active living, or have healthier habits than those who did not respond. Further research with a larger and random sample is required to confidently characterize the needs and strengths of pre-school aged children attending early education and care centers in Boston Chinatown.

APPENDIX 5 –TABLES (1 of 2)

Daily food consumption and activity participation among study population:

Food and Activity Items	Overall Sample						Asian Subpopulation			
	Total		Asian		Other		US-born		Foreign-born	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<i>Daily Food Consumption of Child</i>										
Fruit	140	73	97	71	43	75	15	88	82	69
Fruit Juice	76	40	<b>47</b>	<b>35</b>	<b>29</b>	<b>52</b>	6	33	41	35
Vegetables	128	66	93	68	35	61	14	78	79	66
Sugary drinks	21	11	13	10	8	14	0	0	13	11
Salty snacks	20	10	13	9	7	13	1	6	12	10
Sugary snacks	15	8	<b>5</b>	<b>4</b>	<b>10</b>	<b>18</b>	2	11	3	3
Fast food	14	7	11	8	3	5	1	6	10	9
<i>Daily Activity of Child</i>										
Outdoor play	115	61	<b>75</b>	<b>56</b>	<b>40</b>	<b>73</b>	12	67	63	54
Indoor play	152	80	104	78	48	86	13	72	91	78
Television	115	62	84	65	31	56	11	61	73	65
Nap	151	79	<b>101</b>	<b>75</b>	<b>50</b>	<b>89</b>	16	89	85	73
Family meals	165	87	119	89	46	82	<b>12</b>	<b>67</b>	<b>107</b>	<b>92</b>

Bolded numbers indicate statistically significant differences based on  $p < 0.05$ , Chi-square test

APPENDIX 5 –TABLES  
(continued – 2)

Affirmation and agreement on rules/habits and perceptions among study population:

Survey Items	Total		Overall Population				Asian sub-population			
			Asian		Other		US-born		Foreign-born	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<i>Affirmation to Feeding Practices</i>										
Child eat whatever	110	57	<b>91</b>	<b>66</b>	<b>19</b>	<b>34</b>	9	50	82	69
Child eat whenever	117	61	88	65	29	52	<b>6</b>	<b>33</b>	<b>82</b>	<b>69</b>
Let child take	123	65	<b>98</b>	<b>73</b>	<b>25</b>	<b>46</b>	16	89	82	70
Give food when upset	67	35	<b>56</b>	<b>41</b>	<b>11</b>	<b>20</b>	7	39	49	42
Encourage to try foods	166	86	115	85	51	91	18	100	97	82
Finish food in bowl	158	83	<b>124</b>	<b>91</b>	<b>34</b>	<b>62</b>	<b>14</b>	<b>78</b>	<b>110</b>	<b>93</b>
Food reward	75	39	<b>60</b>	<b>44</b>	<b>15</b>	<b>27</b>	5	28	55	47
Can tell child is full	178	94	124	93	54	96	18	100	106	92
Make sure child is full	168	89	<b>123</b>	<b>92</b>	<b>45</b>	<b>80</b>	18	100	105	91
Set screen time limit	173	92	123	92	50	91	17	94	106	91
Plan playtime	157	83	<b>105</b>	<b>78</b>	<b>52</b>	<b>93</b>	<b>18</b>	<b>100</b>	<b>87</b>	<b>75</b>
Plan bedtime	180	94	127	94	53	95	17	94	110	94
Influenced by opinion	80	42	58	44	22	39	4	22	54	47
Keep food out of reach	124	66	<b>80</b>	<b>61</b>	<b>44</b>	<b>79</b>	<b>15</b>	<b>83</b>	<b>65</b>	<b>57</b>
<i>Perception Agreement</i>										
Worry about safety	119	63	81	61	38	68	14	78	67	59
Healthy food expensive	18	10	10	8	8	14	1	6	9	8
Healthy food close by	124	67	<b>78</b>	<b>61</b>	<b>46</b>	<b>81</b>	14	78	64	58
Caretaker feeds healthy	159	83	112	83	47	84	14	78	98	84
Caretaker gives exercise	159	84	116	87	43	77	13	72	103	89
Healthy eating confidence	145	77	<b>94</b>	<b>71</b>	<b>51</b>	<b>89</b>	<b>18</b>	<b>100</b>	<b>76</b>	<b>67</b>
Bolded numbers indicate statistically significant differences based on p<0.05, Chi-square test										