



## Snack Consumption among Iranian Children and Adolescents: The CASPIAN-IV Study

*Maryam BAHREYNIAN<sup>1</sup>, Mostafa QORBANI<sup>2,3</sup>, Ramin HESHMAT<sup>3</sup>, Mohammad Esmaeil MOTLAGH<sup>4</sup>, Shirin DJALALINIA<sup>5,6,7</sup>, Gelayol ARDALAN<sup>1</sup>, Amir KASAEIAN<sup>5,8</sup>, Fereshteh NAJAFI<sup>8</sup>, Hamid ASAYESH<sup>9</sup>, Bagher LARIJANI<sup>6</sup>, \*Roya KELISHADI<sup>1</sup>*

1. Child Growth and Development Research Center, Research Institute for Primordial Prevention of Non-communicable Disease, Isfahan University of Medical Sciences, Isfahan, Iran
2. Dept. of Community Medicine, Alborz University of Medical Science, Karaj, Iran
3. Chronic Disease Research Center, Endocrinology and Metabolism Population Sciences Institute, Tebran University of Medical Sciences, Tebran, Iran
4. Abvaz Jundishapur University of Medical Sciences, Abvaz, Iran
5. Non-communicable Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tebran University of Medical Sciences, Tebran, Iran
6. Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tebran University of Medical Sciences, Tebran, Iran
7. Development of Research and Technology Center, Deputy of Research and Technology, Ministry of Health and Medical Education, Tebran, Iran
8. Dept. of Epidemiology and Biostatistics, School of Public Health, Tebran University of Medical Sciences, Tebran, Iran
9. Dept. of Medical Emergency, Qom University of Medical Sciences, Qom, Iran

**\*Corresponding Author:** Email: kelishadi@med.mui.ac

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### Abstract

**Background:** This study aimed to assess the frequency of consuming different types of snacks among Iranian students according to socio-economic status (SES) of their living region.

**Methods:** Data were obtained from the fourth national school-based surveillance survey entitled CASPIAN-IV study. Overall, 14880 school students, aged 6-18 years, were selected through multistage, cluster sampling from rural and urban areas of the of 30 provinces of Iran. The World Health Organization Global School Student Health Survey (WHO-GSHS) was used. Data were compared at national/sub-national levels by survey data analysis methods.

**Results:** The participation rate was 90.6%, 13486 students (49.2% girls), mean (SD) age of 12.50 (3.36) years completed the study. At national level, fresh fruits were the most common used category of healthy snacks (55.74%, 95% CI: 54.51, 56.96). Boys had more daily consumption of milk (48.65% vs. 43.27%), and girls had more daily consumption of fresh fruits (58.07% vs. 53.47%). Urban residents had lower consumption of vegetables (30.53% vs. 37.55%), dried fruits (18.29% vs. 23.02%), and fresh fruits (45.33% vs. 50.09%) than their rural counterparts. Among unhealthy snacks, sweets had the highest daily consumption (34.15%, 95% CI: 33.04, 35.28). Boys had higher consumption of sweetened beverages (22.57% vs. 17.6%) and fast foods (3.51% vs. 2.17%). At national level, except than salty snacks (16.24% rural vs.11.83% urban), consumption of other junk snacks had no significant difference between urban and rural residents.

**Conclusion:** Differences in the frequency of consuming healthy and unhealthy snacks according to the SES of the living region, and the choice differences between genders should be considered in planning national health programs.

**Keywords:** Snack, Healthy snack, Junk food, Socio-economic status, Iran

## Introduction

Eating is recognized as a habitual activity and Daily eating is often categorized as three main meals served at a relatively certain time and in a special occasion. In addition to main meals, usually people have several eating episodes with different nutrient and calorie contents during the day, named as snacks (1).

Snacking represents intake of particular kind of food, which almost happens outside of socially accepted main meals. "Snack food" or "non-core food" refer to a food category including items of low nutritional value, poor micronutrient quality and often rich in fat and/or added sugar or salt(2). Snacking, as a common behavior, might occur at any time during a day (3).

The frequency of snacking was reported between once to several times a day among European and American population at any age (3, 4). Type, amount, nutrient content, and time of snacking has large variations by cultural differences (1).

Unlike the numerous previous studies indicating a beneficial effect of frequent healthy snacking, as improved healthy eating index and providing essential micronutrients as iron, calcium, vitamin C, and riboflavin (5), unhealthy snacking might have unfavorable effect on weight gain and development of obesity-related complications (6, 7).

High fat desserts, sugar-sweetened beverages, salty snacks and candies are of major and the most popular sources of energy intake among children and adolescents. Higher fat and refined carbohydrates content of snacks are contributed to their low nutritional values (8).

Snacking comprise a considerable proportion of total daily calorie intake. Habitual snacking has not been evaluated in a large pediatric population and according to socio-economic status (SES) differences. The aim of this study was to assess the frequency of healthy and unhealthy snacking patterns at national, regional and provincial levels in a nationally- representative sample of Iranian children and adolescents.

## Materials and Methods

The present study was conducted in 2011-2012 in 30 provinces of Iran. It was part of the fourth national survey of a nationwide school-based surveillance system entitled "Childhood and Adolescence Surveillance and Prevention of Adult Non communicable Disease" study. The detailed methods is described previously (9) and here we refer to some points in brief.

Study participants consisted of children and adolescents aged 6-18 years, selected through multistage, cluster-sampling method from rural and urban areas. The total calculated sample size was 14,880 (48 clusters of 10 students in each province).

Under the supervision of trained team of health care providers, all participants completed two sets of questionnaires obtained from the World Health Organization-Global School Student Health Survey (WHO-GSHS) in Persian. The reliability and validity of the questionnaire was determined previously (10).

Four groups of foods were considered as healthy snacks, including fruits (fresh and dried), vegetables and dairy products. Junk foods categories were sweets, sweetened beverages, salty snacks, and fast foods.

The students were asked about their daily consumption of each of proposed food choices through a series of questions with two optional responses of "Yes" or "No".

Iran was categorized into 4 sub national regions according to a previous study (11). In order to determine sub-national regions, combination of two criteria (geography and SES using principal component analysis) was used. Some variables from the 2006 census, including literacy rate, family assets and employment rate were used to calculate the SES index. Accordingly, the Central region had the highest SES, followed respectively by the Western (second high), North-Northeast (second low SES), and the Southeast regions (lowest SES). Ethical committees and regulatory organizations approved the study at national and provincial levels. After complete explanation of the study objectives and methods, written informed consent

was obtained from parents and oral assent from students.

### Statistical analysis

Data were analyzed using survey data analysis methods in the STATA Corp. 2011 (Stata Statistical Software: Release 12. College Station, TX: Stata Corp LP. Package). Continuous variables are reported as mean (standard deviation, SD). The frequency of national and sub-national daily consumption of healthy/ junk foods of participants is reported by gender and living place with 95% confidence interval (95% CI).

## Results

Overall, 13486 students participated in the survey (participation rate: 90.6%). They consisted of 6640 (49.2%) girls and 6846 (50.8%) boys; from them 75.6% were from urban areas and 24.4% from rural areas. Mean (SD) of age of participants was 12.5 (3.36) years.

The geographical distribution of participants was as follows: 1181 (8.76%), 2359 (17.49%), 6,119 (45.37%) and 3827 (28.38%), respectively from Southeast (lowest SES), North-Northeast (second low SES), West (second high SES) and Central (highest SES) regions.

The frequency of daily consumption of healthy foods is presented by gender and living place, separately, at national and regional levels in Table 1.

**Table 1:** The frequency [95% CI] of daily consumption of healthy foods according to students' report at national and regional level by sex and living area: the CASPIAN-IV Study

Region	Milk	Vegetables	Dried Fruits	Fresh Fruits
Southeast (lowest SES)				
Boys	43.27[36.13,50.7]	19.38[15.29,24.25]	8.383[5.924,11.74]	26.79[21.49,32.85]
Girls	41.81[35.96,47.91]	28.93[24.87,33.36]	16.41[12.78,20.81]	41.4[35.45,47.62]
Urban	42.37[36.15,48.84]	25.81[21.61,30.51]	16.12 [12.73,20.2]	40.47[34.49,46.74]
Rural	42.64[35.49,50.12]	22.87[18.43,28.03]	8.263 [5.191,12.9]	27.46[21.84,33.91]
Total	42.49[37.77,47.36]	24.49[21.38,27.89]	12.69[10.19,15.69]	34.61 [30.43,39.05]
North-Northeast (second low SES)				
Boys	47.43[43.41,51.49]	32.18[29.09,35.44]	18.47[15.25,22.18]	54.44 [50.12,58.7]
Girls	37.21 [32.92,41.71]	31.74[28.54,35.12]	18.49[15.39,22.04]	54.12[49.62,58.55]
Urban	39.37[36.02,42.82]	33.29[30.69,36.01]	19.57[16.99,22.43]	58.43[55.11,61.68]
Rural	50.31[43.86,56.75]	28.42[23.97,33.32]	15.61[11.32,21.14]	43.35[36.99,49.94]
Total	42.37[39.28,45.51]	31.96[29.7,34.3]	18.48[16.22,20.97]	54.28[51.22,57.31]
West (second high SES)				
Boys	48.25[45.58,50.93]	36.03[33.79,38.33]	25.02[22.62,27.58]	52.74[50.08,55.38]
Girls	47.38[44.32,50.45]	40.03[37.66,42.45]	24.03[21.79,26.42]	58.32[55.61,60.99]
Urban	46.3[43.96,48.66]	40.18[38.38,42.01]	25.85[23.88,27.92]	58.65[56.58,60.68]
Rural	52.45[47.96,56.9]	31.39[27.86,35.15]	20.47 [17.5,23.81]	45.82[41.54,50.17]
Total	47.82[45.73,49.91]	38.01[36.38,39.67]	24.53[22.87,26.27]	55.5[53.58,57.4]
Central (highest SES)				
Boys	51.48[48.14,54.81]	37.18[34.6,39.84]	23.09[20.28,26.16]	61.44[58.4,64.4]
Girls	40.9[37.45,44.44]	39.52[36.71,42.41]	22.55[20.05,25.26]	66.03[63.4,68.57]
Urban	44.8 [42.21,47.42]	38.44[36.35,40.57]	22.49 [20.42,24.7]	63.86[61.73,65.93]
Rural	55.44[48.6,62.09]	37.5[32.73,42.52]	24.64[19.83,30.18]	62.44[56.4,68.11]
Total	46.45[44.05,48.86]	38.29[36.37,40.25]	22.83[20.92,24.86]	63.64[61.63,65.6]
National				
Boys	48.65[46.84,50.46]	34.35 [32.9,35.83]	21.89[20.37,23.5]	53.47[51.69,55.25]
Girls	43.27[41.32,45.24]	37.36[35.85,38.9]	21.86[20.44,23.34]	58.07[56.31,59.81]
Urban	44.4[42.89,45.93]	37.55[36.36,38.74]	23.02[21.8,24.29]	59.09[57.73,60.43]
Rural	50.97[47.98,53.95]	30.53[28.3,32.86]	18.29[16.26,20.52]	45.33[42.43,48.26]
Total	46.0[44.64,47.36]	35.84[34.79,36.89]	21.88[20.83,22.96]	55.74[54.51,56.96]

Data are presented as percentage (95%CI)

At national level, fresh fruits category was reported as the most common used category of healthy snacks (55.74%, 95% CI: 54.51, 56.96). This frequency was followed by milk (46.0%, 95% CI: 44.64, 47.36), vegetables (35.84%, 95% CI: 34.79, 36.89), and dried fruits (21.88%, 95% CI: 20.83, 22.96), respectively.

The consumption of fresh fruits, with the greatest difference between other categories, was significantly different across various regions of Iran. In the region with highest SES, students had the most daily consumption of fresh fruits (63.64%, 95% CI: 61.63, 65.6), whereas the least

report was related to the students living in the region with lowest SES (34.61%, 95% CI: 30.43, 39.05). The second and third ranks, respectively, belonged to the second high SES (55.5%, 95% CI: 53.58, 57.4), and the second low SES (54.28%, 95% CI: 51.22, 57.31).

Daily consumption of milk and fresh fruits differed significantly between girls and boys.

Boys had higher daily consumption of milk (48.65% vs. 43.27%), whereas girls reported higher daily consumption of fresh fruits than boys (58.07% vs. 53.47%).

**Table 2:** The frequency [95% CI] of daily consumption of junk foods according to students' report at national and regional level by sex and living area: the CASPIAN-IV Study

Region	Sweet	Sweetened beverages	Salty snake	Fast food
Southeast (lowest SES)				
Boys	28.0 [23.16,33.42]	23.64[19.04,28.94]	18.28[14.41,22.92]	1.83[1.03,3.22]
Girls	32.43[27.7,37.55]	24.32[20.26,28.91]	15.61[12.35,19.53]	2.71[1.63,4.49]
Urban	32.2[27.25,37.59]	25.12 [20.88,29.89]	15.74[12.34,19.86]	1.86[1.07,3.22]
Rural	28.11[23.58,33.15]	22.64[18.19,27.81]	18.22[14.18,23.1]	2.84[1.7,4.7]
Total	30.36[26.91,34.06]	24.0[20.9,27.4]	16.85 [14.3,19.76]	2.3[1.57,3.35]
North-Northeast (second low SES)				
Boys	29.27[26.01,32.76]	22.88[19.9,26.16]	8.41[6.743,10.44]	3.79[2.75,5.19]
Girls	31.71[28.43,35.18]	18.12[15.77,20.73]	8.81 [7.035,10.98]	2.48[1.64,3.72]
Urban	29.15[26.55,31.89]	20.39[18.13,22.84]	7.6[6.242,9.219]	3.04[2.24,4.11]
Rural	34.0[28.84,39.58]	20.87[16.91,25.46]	11.28[8.447,14.92]	3.4[2.18,5.26]
Total	30.48[28.14,32.93]	20.52[18.55,22.63]	8.61 [7.307,10.12]	3.14[2.44,4.03]
West (second high SES)				
Boys	36.13[33.54,38.79]	23.09 [21.27,25.01]	13.91[12.45,15.52]	3.59[2.91,4.41]
Girls	37.96[35.56,40.41]	18.71 [16.93,20.63]	18.16[16.26,20.24]	2.37[1.82,3.07]
Urban	35.76[33.8,37.77]	21.2[19.75,22.73]	15.16[13.79,16.64]	3.42[2.87,4.08]
Rural	40.92 [36.8,45.18]	20.08[17.38,23.09]	18.65[16.04,21.56]	1.66[1.12,2.46]
Total	37.03[35.23,38.88]	20.92[19.64,22.27]	16.02[14.79,17.32]	2.99[2.54,3.51]
Central (highest SES)				
Boys	32.87[30.1,35.76]	21.3[19.08,23.69]	9.70[8.294,11.33]	3.69[2.79,4.88]
Girls	33.19[30.54,35.94]	13.08[11.42,14.94]	9.05[7.357,11.09]	1.44[0.99,2.08]
Urban	32.63[30.59,34.74]	16.9 [15.31,18.62]	8.57[7.48,9.80]	2.76[2.16,3.54]
Rural	35.14[30.14,40.48]	20.1[16.37,24.43]	13.85[10.25,18.45]	1.86[0.93,3.69]
Total	33.02[31.12,34.98]	17.4[15.92,18.98]	9.39[8.287,10.63]	2.62[2.08,3.31]
National				
Boys	33.31[31.71,34.95]	22.57[21.32,23.87]	12.06[11.13,13.06]	3.51[3.04,4.06]
Girls	35.02[33.5,36.57]	17.6[16.47,18.78]	13.76[12.63,14.98]	2.17[1.81,2.59]
Urban	33.42[32.19,34.68]	19.95[18.98,20.95]	11.83[11.03,12.68]	3.05[2.68,3.46]
Rural	36.42[33.9,39.01]	20.66[18.83,22.61]	16.24[14.54,18.1]	2.23[0.93,3.69]
Total	34.15[33.04,35.28]	20.12[19.26,21.0]	12.9[12.17,13.67]	2.85[2.55,3.19]

Data are presented as percentage (95% CI)

Except than milk consumption with non-significant difference in urban and rural areas, students living in urban areas had significant lower consumption of vegetables (30.53% vs. 37.55%), dried fruits (18.29% vs. 23.02%), and fresh fruits (45.33% vs. 50.09%) than their urban counterparts.

Appendix 1 shows the frequency of daily consumption of healthy foods by gender and living place of participants at provincial level.

The lowest consumption of milk, vegetables, dried fruits, and fresh fruits were reported from: Yazd (32.5%, 95% CI: 26.19, 39.52), Sistan-Balouchestan(19.02%, 95% CI: 14.25, 24.92), Hormozgan (7.23 %, 95% CI: 4.685, 10.99), and Sistan-Balouchestan (24.05%, 95% CI: 18.18, 31.11), respectively.

Table 2 shows the frequency of daily consumption of junk foods by gender and living place, at national and regional levels. The consumption of junk foods was significantly different between regions with various SES. Sweets had the highest daily consumption (34.15%, 95% CI: 33.04, 35.28), followed by sweetened beverages (20.12%, 95% CI: 19.26, 21.0), salty snacks (12.9%, 95% CI: 12.17, 13.67), and fast foods (2.85%, 95% CI: 2.55, 3.19), respectively.

Boys had significantly higher consumption of sweetened beverages (22.57% vs. 17.6%), and fast foods (3.51% vs. 2.17%) than girls did.

At national level, except than salty snacks (16.24% in rural vs. 11.83% in urban), consumption of other junk foods had no significant difference between urban and rural residents.

Appendix 2 shows the frequency of daily consumption of junk foods by gender and living area at provincial level.

## **Discussion**

The frequency of daily intake of healthy and unhealthy snacks was estimated according to SES and living area. The higher frequency rate of healthy snack consumption was found among those participants living in the highest and second-high SES (Central and West, respectively),

while the regions with the lowest and second-low SES (Southeast and North-Northeast) had the lowest frequency consumption of healthy snacks. In contrast, children and adolescents living in areas with lower SES reported higher intake of unhealthy snacks.

Proper eating patterns contribute to overall healthy growth and development. Higher consumption of low-nutrient high-dense foods may lead to increased risk of diabetes, hypertension, malnutrition, eating disorders and overall poor health status (12, 13).

In the current study, consumption of healthy snacks including milk, vegetables, dried and fresh fruits was at its lowest amount in regions with the lowest SES development. By contrast, adherence to unhealthy eating patterns as junk food consumption including cakes, cookies and biscuits was found to be at the highest level in the lowest SES regions. Multiple factors are related to adopt an unhealthy food pattern among residents of low SES areas. The association of income and poor dietary intake could partly be explained by the higher cost of nutrient-dense foods compared to energy-dense nutrient-poor foods and the lower availability of nutrient-dense foods in stores located in lower income areas (14, 15). Inadequate nutrition knowledge might be another barrier to healthful eating patterns in low SES households. Furthermore, in some areas as Sistan-Baluchestan, located in south eastern area, despite a remarkable improved health care services and health promotion education, several underlying factors such as people's attitude might interfere with healthy practices (16).

Our finding is consistent with the previous studies indicating that the intake of fruits and vegetables is higher among individuals with higher SES (17). Similarly, a positive association was reported between parental educational level with fruit and vegetable intake among Canadian adolescents (18). Moreover, higher consumption of unhealthy snacks could affect the proportion of healthy snack intake. For instance, in the Bogalusa Heart Study, the total amount of milk intake was significantly lower among the students with medium to high consumption of sugar-sweetened beverages

compared to their other counterparts. The contribution of unhealthy to healthy snacks led to significantly higher total calorie intake and subsequently excess weight (19). Thus, it is necessary to encourage families for healthy eating habits and to be good role models for their children. Nutrition education and lifestyle modifications could exert their beneficial effects in older ages especially when established in early life (20-22).

In addition to nutrition knowledge, home environment and parental education, the phenomena of nutrition transition, namely getting away from healthy, nutritious, and traditional diets to westernized high calorie foods and sedentary lifestyle is another leading cause of unhealthy snacking in developing countries as Iran (23, 24). Previous reports of Iranian students have indicated that consumption of fruits, vegetables, dairy and snacks were approximately two-times per day (25). Our study has some limitations that need to be considered. First, recall bias of snack intake might have occurred, second, lack of standard definition of snacking and food items. For instance, items as milk and some fast foods might represent a meal in some regions. Third, our questionnaire included major types of snacks usually used in Iran, but not all of them, for instance, consumption of nuts and seeds were included in our questionnaire. Fourth, under- and overestimation of habitual snacking is common in studies assessing dietary intake.

## Conclusion

The current study has reported, for the first time, the frequency of snacking behavior in a large representative nationwide sample of Iranian students. The results of this study would provide valuable information in terms of understanding the most commonly used snacks among Iranian children and adolescents, and might be helpful for establishment of nutrition interventions and health education addressing student knowledge and attitude toward healthy eating and behavior modification; moreover fortification of children's favorite and healthy snacks can be a useful strategy for health promotion.

## Ethical considerations

Ethical issues (Including plagiarism, Informed Consent, misconduct, and/or falsification, double publication) have been considered carefully

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**Appendix 1:** The frequency [95%CI] of daily consumption of healthy foods according to students' report at provincial level by sex and living area: the CASPIAN-IV Study

Province	Milk	Vegetables	Dried Fruits	Fresh Fruits
<b>Eastern Azerbaijan</b>				
Boys	52.42[43.24,61.44]	33.33[25.04,42.8]	22.54[15.61,31.4]	38.36[29.93,47.55]
Girls	47.26[38.24,56.46]	33.33[25.11,42.71]	15.14[9.95,22.35]	40.89[32.74,49.57]
Urban	50.5[43.12,57.87]	35.35[28.95,42.33]	19.38[14.63,25.21]	40.69[34.19,47.53]
Rural	47.13[32.99,61.74]	24.14[11.56,43.64]	15.94[6.109,35.6]	34.57 [19.69,53.23]
Total	49.9[43.28,56.52]	33.33 [27.25,40.02]	18.72[14.14,24.34]	39.61[33.53,46.02]
<b>Western Azerbaijan</b>				
Boys	42.92[35.87,50.26]	33.75 [26.37,42.02]	27.31[19.72,36.49]	56.25 [47.83,64.33]
Girls	52.5[41.84,62.93]	42.5[35.43,49.89]	27.08[20.88,34.33]	55.0 [46.34,63.37]
Urban	50.31[42.09,58.52]	42.5[35.43,49.89]	27.67[21.3,35.1]	61.25 [54.24,67.82]
Rural	42.5[31.3,54.52]	29.37 [23.59,35.92]	26.25[19.05,34.99]	44.38[34.39,54.83]
Total	47.71[40.93,54.58]	38.13[32.74,43.82]	27.2[22.2,32.84]	55.63[49.42,61.66]
<b>Ardabil</b>				
Boys	51.43 [34.49,68.05]	61.43[41.4,78.21]	40.0[22.22,60.87]	64.29[53.97,73.43]
Girls	51.26[37.52,64.81]	42.86[34.59,51.54]	31.09[18.44,47.39]	55.46[43.81,66.54]
Urban	51.57[38.87,64.07]	51.57[40.75,62.25]	34.59[21.89,49.95]	61.01[50.95,70.2]
Rural	50.0[40.62,59.38]	40.0[18.98,65.49]	33.33[20.66,48.98]	46.67[41.25,52.16]
Total	51.32[40.48,62.04]	49.74[39.75,59.74]	34.39 [23.29,47.5]	58.73[50.04,66.91]
<b>Isfahan</b>				
Boys	63.5 [53.69,72.3]	30.42[24.9,36.57]	21.67[14.92,30.39]	55.51[47.87,62.9]
Girls	43.58[34.23,53.41]	43.12[35.29,51.31]	20.64[15.13,27.51]	62.39 [55.95,68.42]
Urban	50.77[42.77,58.73]	37.95[32.3,43.95]	21.28[16.2,27.44]	57.18[51.31,62.85]
Rural	70.33[54.63,82.35]	28.57[18.82,40.84]	20.88[11.25,35.46]	64.84[54.5,73.94]
Total	54.47[47.08,61.67]	36.17 [31.04,41.64]	21.21[16.56,26.74]	58.63[53.39,63.68]
<b>Alborz</b>				
Boys	73.28[64.03,80.85]	35.34[28.41,42.96]	19.4[14.42,25.58]	68.53 [61.11,75.12]
Girls	54.03[43.35,64.35]	36.29[29.97,43.13]	21.37[16.0,27.94]	76.61[70.5,81.79]
Urban	61.62[52.33,70.14]	34.59[28.98,40.67]	18.92[14.74,23.95]	72.97[67.21,78.05]
Rural	69.09[55.63,79.94]	40.0[31.91,48.67]	25.45[17.28,35.82]	71.82[63.2,79.09]
Total	63.33[55.53,70.49]	35.83[31.05,40.92]	20.42[16.53,24.95]	72.71[67.9,77.04]
<b>Ilam</b>				
Boys	55.38[46.12,64.29]	36.54[28.88,44.94]	33.46[25.31,42.74]	58.69[49.01,67.74]
Girls	52.27[41.38,62.95]	37.27 [30.6,44.47]	28.9[22.31,36.52]	56.36[47.1,65.2]
Urban	52.75[44.74,60.63]	38.25[32.49,44.36]	32.4[26.52,38.89]	60.65[53.24,67.61]
Rural	60.0[37.88,78.68]	30.0[21.09,40.73]	26.25 [16,39.95]	42.5[32.08,53.63]
Total	53.96[46.35,61.39]	36.88[31.81,42.25]	31.36[26.08,37.16]	57.62[51.01,63.97]
<b>Bushehr</b>				
Boys	48.61[39.2,58.12]	52.59[44.67,60.38]	24.28[16.75,33.82]	55.69[47.56,63.53]
Girls	46.3[33.62,59.47]	53.95[46.07,61.65]	10.43[6.403,16.53]	55.19[45.31,64.68]
Urban	44.99[36.86,53.4]	53.27[47.5,58.96]	18.27[13.15,24.81]	56.19[49.73,62.45]
Rural	76.32 [59.2,87.74]	52.63[30.09,74.15]	13.16[3.294,40.26]	47.37[21.23,75.03]
Total	47.54 [39.51,55.69]	53.22[47.58,58.78]	17.84 [12.96,24.06]	55.46[49.61,74]
<b>Tehran</b>				
Boys	57.27[46.56,67.34]	35.06[29.73,40.8]	18.65[13.72,24.85]	57.21[48.45,65.54]
Girls	52.4[41.89,62.71]	40.97[33.84,48.5]	17.17[12.71,22.79]	61.99[53.74,69.6]
Urban	55.73[48.1,63.1]	38.26[33.62,43.11]	17.85[14.35,21.99]	59.49[53.31,65.38]
Rural	18.18[13.99,23.28]	27.27[20.89,34.75]	20.0[14.97,26.2]	63.64 [46.46,77.92]
Total	54.82 [47.23,62.2]	37.99[33.45,42.75]	17.9[14.48,21.93]	59.59[53.54,65.37]
<b>Chaharmahal-Bakhtiari</b>				



Boys	42.59[34.58,51.01]	33.7[28.14,39.76]	20.45[14.47,28.09]	49.07[41.55,56.63]
Girls	52.86[40.71,64.67]	42.65[34.29,51.46]	19.42[13.84,26.55]	49.28[38.72,59.91]
Urban	42.81[34.46,51.6]	41.02 [36.26,45.95]	22.05[16.38,29.01]	51.81[44.33,59.21]
Rural	56.85[44.16,68.7]	29.93[19.18,43.47]	15.28[9.498,23.66]	43.15[31.3,55.84]
Total	47.08[39.76,54.53]	37.63[32.49,43.07]	20.0[15.52,25.38]	49.16[42.65,55.7]
Razavi-Khorasan				
Boys	47.33[35.54,59.43]	26.0[19.28,34.08]	20.55[14.2,28.79]	51.35[40.26,62.31]
Girls	41.81[33.83,50.23]	17.33[12.66,23.27]	19.46[14.05,26.32]	49.67[41.36,57.99]
Urban	41.43[34.5,48.71]	21.14 [16.2,27.11]	21.39 [16.5,27.25]	52.30[45.24,59.27]
Rural	51.52[34.03,68.63]	17.0[11.16,25.04]	14.29[7.163,26.47]	43.0[27.69,59.78]
Total	43.65[36.91,50.64]	20.22[15.97,25.27]	19.82[15.69,24.72]	50.22[43.54,56.9]
North-Khorasan				
Boys	43.75[34.94,52.97]	29.41[22.56,37.34]	20.45[15.02,27.21]	46.32[35.98,57]
Girls	38.65[28.37,50.04]	29.47[22.11,38.08]	20.98 [14.09,30.04]	39.81[30.62,49.77]
Urban	37.5[29.88,45.79]	33.52[27.6,40.02]	23.21 [18,29.38.0]	50.57[42.39,58.71]
Rural	52.76[38.47,66.61]	18.11[10.44,29.57]	13.6[7.168,24.29]	23.81 [15.3,35.08]
Total	41.54[34.41,49.05]	29.44[24.18,35.31]	20.68[16.21,25.99]	43.51[36.25,51.07]
Khozestan				
Boys	45.26[35.74,55.13]	39.39[31.9,47.43]	23.5[14.32,36.08]	47.51[36.55,58.72]
Girls	31.73[22.48,42.7]	44.17[35.12,53.63]	22.15[14.66,32.03]	51.81[42.99,60.52]
Urban	40.43[33.01,48.31]	43.05[36.74,49.6]	23.59[16.49,32.56]	50.57[43.13,57.99]
Rural	30.43[13.14,55.86]	34.29[20.43,51.45]	19.3[7.965,39.79]	43.94[24.84,65.02]
Total	38.86[31.66,46.59]	41.65[35.72,47.83]	22.91[16.46,30.93]	49.52[42.37,56.69]
Zanjan				
Boys	57.14[47.42,66.35]	34.92[25.93,45.13]	20.27 [11.45,33.33]	53.55[43.89,62.95]
Girls	45.63[35.74,55.89]	34.92[26.53,44.36]	47.37[30.59,64.76]	68.02[57.02,77.32]
Urban	44.64 [35.83,53.81]	35.59[28.91,42.87]	44.44 [27.79,62.44]	70.33[60.77,78.39]
Rural	60.87[47.48,72.8]	33.75[21.58,48.54]	19.67[10.59,33.61]	47.13[35.5,59.09]
Total	50.57[42.8,58.3]	34.92[28.48,41.96]	35.5[23.52,49.63]	61.86[53.7,69.4]
Semnan				
Boys	41.77[35.38,48.46]	40.17[32.72,48.1]	21.67[12.14,35.63]	53.85[42.4,64.9]
Girls	32.91 [25.17,41.71]	41.45[35.03,48.18]	28.0[17.79,41.13]	72.41[64.48,79.15]
Urban	35.64[29.98,41.74]	41.46 [36.08,47.05]	27.22[18.87,37.55]	67.0[59.74,73.54]
Rural	47.14[35.69,58.91]	37.14[25.21,50.89]	11.32 [4.5,25.7]	40.58[21.07,63.6]
Total	37.34[32.07,42.93]	40.81[35.83,45.99]	25.0[17.56,34.29]	63.09[55.52,70.07]
Sistan-Baluchestan				
Boys	44.06[31.42,57.52]	12.5 [7.38,20.39]	8.72[4.377,16.61]	16.34[10.46,24.61]
Girls	48.99[39.42,58.63]	24.29[18.13,31.74]	15.95[10.2,24.07]	30.36[22.69,39.32]
Urban	51.09[39.98,62.1]	22.37[15.29,31.51]	15.77[10.08,23.82]	28.38[20.13,38.4]
Rural	42.27[30.96,54.46]	15.53[10.1,23.11]	9.27[3.918,20.38]	19.55[12.27,29.67]
Total	46.77[38.63,55.08]	19.02[14.25,24.92]	12.65[8.259,18.88]	24.05[18.18,31.11]
Fars				
Boys	47.57[36.67,58.71]	45.15[37.19,53.36]	21.0[12.99,32.12]	61.95[52.03,70.97]
Girls	48.18[38.35,58.14]	44.89[36.48,53.6]	15.75[11.91,20.54]	62.5[54.37,69.98]
Urban	44.29[36.04,52.86]	45.71[39.16,52.42]	17.73 [12.93,23.83]	63.04 [55.84,69.7]
Rural	57.69[43.28,70.9]	43.08[30.65,56.44]	18.6[10.6,30.58]	60.16[47.46,71.62]
Total	47.92[40.54,55.39]	45.0[39.06,51.09]	17.97[13.66,23.27]	62.26[56.02,68.13]
Qazvin				
Boys	52.08[40.7,63.25]	40.25[33.67,47.2]	24.9 [16.76,35.3]	60.58 [50.57,69.77]
Girls	44.12[35.46,53.15]	38.08[30.43,46.36]	19.33 [13.29,27.25]	58.58 [50.39,66.32]
Urban	45.28[37.65,53.14]	38.61[32.73,44.85]	23.68[17.18,31.69]	61.94[54.92,68.5]
Rural	56.78[39.58,72.48]	40.83[30.6,51.93]	17.5[10.77,27.15]	52.5[38.44,66.17]
Total	48.12[40.84,55.47]	39.17 [34,44.59]	22.13[16.82,28.54]	59.58[53.11,65.74]
Qom				
Boys	40.68[33.09,48.74]	34.62[27.7,42.24]	25.26[19.13,32.56]	51.83[45.58,58.04]
Girls	27.0[21.51,33.31]	29.41[23.03,36.72]	23.39[17.72,30.23]	57.98[52.34,63.42]

Urban	34.14[28.91,39.79]	32.74[27.79,38.11]	24.17[19.69,29.31]	55.05[50.65,59.37]
Rural	26.32[18.09,36.61]	15.0[9.242,23.42]	26.32 [18.09,36.61]	55.0[47.94,61.87]
Total	33.83[28.77,39.28]	31.99[27.15,37.26]	24.27[19.96,29.18]	55.04[50.83,59.19]
<b>Kordestan</b>				
Boys	37.97[30.32,46.27]	24.72[19.23,31.17]	24.2 [16.83,33.51]	53.03[43.14,62.69]
Girls	45.97[35.38,56.94]	28.3[19.26,39.51]	28.49[18.99,40.37]	64.08[52.94,73.88]
Urban	41.34[32.82,50.41]	32.22[25.67,39.55]	27.8[20.18,36.96]	66.56 [58.26,73.95]
Rural	41.89 [32.34,52.1]	13.33[8.951,19.4]	22.73[13.4,35.86]	38.19[25.1,53.27]
Total	41.51[34.85,48.5]	26.3[21.05,32.33]	26.09[19.85,33.46]	57.87[49.77,65.57]
<b>Kerman</b>				
Boys	49.76[37.96,61.58]	23.9[17.56,31.66]	10.29[6.665,15.55]	40.69[31.2,50.93]
Girls	37.25[29.0,46.33]	31.76[25.37,38.93]	20.52 [14.76,27.8]	52.36[42.49,62.05]
Urban	39.66[30.91,49.12]	28.97[23.43,35.21]	20.83[15.59,27.27]	53.98[45.27,62.45]
Rural	48.24[35.91,60.78]	27.06[18.58,37.62]	7.14[4.657,10.81]	35.5[26.19,46.06]
Total	42.83 [35.51,50.47]	28.26[23.39,33.7]	16.09 [12.19,20.94]	47.16[40.18,54.26]
<b>Kermanshah</b>				
Boys	53.85[42.64,64.68]	27.69[21.12,35.4]	28.46[20.79,37.61]	52.14[42.71,61.42]
Girls	56.62[45.33,67.26]	30.14[22.34,39.28]	35.98[26.24,47.03]	65.28[55.69,73.76]
Urban	50.0[41.66,58.34]	26.15[20.84,32.28]	31.37[24.31,39.4]	56.88[49.67,63.81]
Rural	77.53[61.69,88.08]	40.45[25.93,56.85]	34.48[19.83,52.83]	63.64[39.95,82.16]
Total	55.11[47.16,62.82]	28.81[23.41,34.89]	31.96[25.43,39.28]	58.14[50.84,65.1]
<b>Kohgiluyeh</b>				
Boys	37.81[30.16,46.12]	28.36[20.92,37.19]	22.89[16.21,31.29]	39.30[28.29,51.52]
Girls	42.91 [32.05,54.51]	46.15[37.28,55.28]	24.29[17.4,32.83]	55.06[44.13,65.52]
Urban	42.36[33.15,52.14]	45.83[37.87,54.01]	28.82[22.52,36.06]	59.72[50.32,68.46]
Rural	37.5[27.39,48.84]	24.38[16.07,35.17]	14.37[8.41,23.5]	26.88[17.96,38.16]
Total	40.63 [33.55,48.11]	38.17[31.49,45.33]	23.66[18.59,29.61]	47.99[39.78,56.31]
<b>Golestan</b>				
Boys	51.67[42.65,60.59]	31.46[25.72,37.84]	24.41[16.56,34.45]	52.67[44.37,60.83]
Girls	27.01[18.01,38.42]	36.97[30.12,44.38]	14.71[10.84,19.64]	52.66[39.79,65.18]
Urban	34.44[25.81,44.24]	37.92[32.18,44.01]	20.55 [15.0,27.5]	59.39 [49.72,68.38]
Rural	49.05[36.91,61.3]	28.71[21.53,37.14]	19.51[11.63,30.88]	44.23[33.81,55.19]
Total	40.83 [33.29,48.83]	33.89[29.11,39.03]	20.09[15.13,26.17]	52.67[45.21,60]
<b>Gilan</b>				
Boys	43.08[35.55,50.94]	35.0[28.73,41.83]	11.54 [6.283,20.24]	61.15[51.76,69.79]
Girls	38.18[28.24,49.22]	35.45[28.16,43.5]	14.55 [7.682,25.83]	62.73 [52.35,72.05]
Urban	40.81[33.63,48.41]	34.32[28.83,40.28]	14.05[8.777,21.75]	65.95[59.28,72.03]
Rural	40.91[28.7,54.35]	38.18[28.67,48.69]	9.09[2.78,25.89]	48.18[31.46,65.32]
Total	40.83[34.55,47.43]	35.21[30.36,40.38]	12.92[8.331,19.49]	61.87 [54.96,68.34]
<b>Lorestan</b>				
Boys	56.1[41.55,69.67]	30.08 [21.15,40.84]	16.87[8.316,31.22]	44.35[32.69,56.68]
Girls	54.08[39.87,67.66]	28.57[21.27,37.19]	20.83 [12.9,31.86]	62.50[47.65,75.32]
Urban	48.45[40.01,56.98]	29.01[22.62,36.36]	22.32[13.87,33.9]	58.75[49.46,67.46]
Rural	73.33 [36.88,92.83]	30.51[14.57,53.06]	9.3[2.26,31.27]	35.0[15.28,61.65]
Total	55.2[42.77,67.02]	29.41[22.62,37.26]	18.71[11.64,28.67]	52.27[41.42,62.92]
<b>Mazandaran</b>				
Boys	51.68[43.94,59.34]	37.02[29.88,44.78]	15.63[9.253,25.17]	60.53[52.18,68.3]
Girls	38.36[30.03,47.44]	44.16[36.87,51.7]	23.08[15.15,33.51]	66.36[58.68,73.27]
Urban	41.35[35.14,47.86]	40.22[34.44,46.28]	19.19[13.65,26.29]	63.74[57.73,69.35]
Rural	59.0[46.32,70.58]	41.84[29.74,55.01]	19.48[7.61,41.53]	62.11[48.06,74.37]
Total	45.11[39.16,51.2]	40.56[35.26,46.08]	19.25[13.87,26.09]	63.39[57.83,68.62]
<b>Markazi</b>				
Boys	46.4 [38.82,54.16]	41.58[33.75,49.86]	32.14 [23.34,42.43]	69.52[60.27,77.42]
Girls	48.5 [38.12,59.01]	51.5[42.68,60.23]	30.85 [23.36,39.5]	74.24[66.73,80.55]
Urban	46.07 [38.97,53.33]	47.7[40.87,54.61]	27.67[21.6,34.68]	71.15[64.19,77.24]
Rural	51.38[37.11,65.42]	39.09[26.42,53.43]	46.24[30.15,63.15]	72.82[58.06,83.83]

Total	47.28[40.83,53.82]	45.72[39.54,52.04]	31.59[25.29,38.65]	71.52[65.31,77.01]
<b>Hormozgan</b>				
Boys	32.87[22.91,44.64]	22.54[14.3,33.65]	5.344[3.082,9.109]	21.58[12.89,33.86]
Girls	37.01[24.49,51.56]	32.28[24.21,41.57]	9.322[5.347,15.76]	40.94[27.46,55.94]
Urban	33.08[22.33,45.94]	24.81 [15.76,36.78]	6.56[4.428,9.607]	31.5 [18.94,47.49]
Rural	36.43[24.48,50.32]	29.29[21.6,38.37]	7.87 [3.846,15.44]	30.22[19.14,44.2]
Total	34.81[26.41,44.28]	27.14[20.9,34.42]	7.23 [4.685,10.99]	30.83[22.1,41.19]
<b>Hamadan</b>				
Boys	53.16[43.24,62.84]	39.33[31.89,47.3]	25.0 [18.05,33.53]	66.81[58.83,73.93]
Girls	41.25[30.42,53]	44.58[37.82,51.56]	24.09[17.56,32.11]	73.48[65.27,80.33]
Urban	45.38[36.42,54.64]	42.53 [36.68,48.6]	26.44[20.36,33.57]	69.94[63.18,75.94]
Rural	51.91[36.33,67.13]	40.46 [29.54,52.41]	19.33 [12.07,29.48]	70.49[57.53,80.82]
Total	47.17 [39.28,55.21]	41.96[36.69,47.43]	24.55[19.49,30.43]	70.09[64.14,75.42]
<b>Yazd</b>				
Boys	39.29[31.35,47.83]	39.43[31.15,48.35]	20.08 [13.62,28.58]	71.33[65.29,76.69]
Girls	23.0[14.79,33.96]	37.5[27.49,48.7]	21.03[15.27,28.22]	64.32[55.67,72.13]
Urban	31.67[25.25,38.86]	37.47[30.42,45.09]	20.3[15.24,26.52]	68.02[62.59,73.0]
Rural	38.33[18.66,62.74]	46.67[32.8,61.07]	21.67[12.72,34.43]	71.19[55.42,83.08]
Total	32.5[26.19,39.52]	38.62[32.11,45.57]	20.48 [15.84,26.06]	68.41[63.31,73.1]

Data are presented as percentage (95%CI)

**Appendix 2:** The frequency [95%CI] of daily consumption of junk foods according to students' report at provincial level by sex and living area: the CASPIAN-IV Study

Province	Sweet	Sweetened beverages	Salty snake	Fast food
<b>Eastern Azerbaijan</b>				
Boys	33.74[25.95,42.53]	18.88[13.31,26.06]	13.36 [8.511,20.36]	2.41[1.03,5.55]
Girls	37.82[32.08,43.91]	16.88[11.5,24.09]	20.34[12.92,30.52]	2.54[1.23,5.18]
Urban	36.62[31.4,42.17]	19.85[15.41,25.19]	16.12[11.57,22.02]	2.51[1.36,4.61]
Rural	31.82[18.63,48.74]	9.09[3.39,22.18]	19.77 [7.45,42.98]	2.3[0.66,7.75]
Total	35.74[30.65,41.18]	17.9[13.85,22.82]	16.77[12.09,22.79]	2.47[1.42,4.28]
<b>Western Azerbaijan</b>				
Boys	33.33[25.02,42.83]	28.33 [21.78,35.95]	12.08[8.297,17.27]	3.33[1.69,6.48]
Girls	34.58[28.62,41.07]	20.83[15.66,27.16]	17.08[11.93,23.86]	1.67[0.68,4.05]
Urban	35.0[29.74,40.65]	24.06[18.53,30.63]	13.44[9.652,18.41]	3.44[1.98,5.9]
Rural	31.87 [21.28,44.75]	25.63[18.76,33.96]	16.88[11.33,24.38]	0.63[0.09,4.16]
Total	33.96[28.78,39.56]	24.58 [20.12,29.67]	14.58[11.3,18.62]	2.5[1.44,4.3]
<b>Ardabil</b>				
Boys	40.0[28.62,52.57]	47.14[31.4,63.48]	20.0[11.83,31.78]	5.71[2.12,14.49]
Girls	36.13 [25.75,48.0]	29.41[21.77,38.42]	13.45[6.184,26.8]	2.52[0.42,13.58]
Urban	36.48[27.98,45.91]	33.96[25.86,43.13]	15.72 [9.40,25.11]	2.52[0.62,9.69]
Rural	43.33[23.86,65.11]	46.67[20.44,74.87]	16.67 [4.60,45.33]	10.0[3.73,24.18]
Total	37.57[29.59,46.28]	35.98 [27.48,45.46]	15.87 [9.88,24.52]	3.7[1.44,9.19]
<b>Isfahan</b>				
Boys	30.04[23.02,38.14]	15.21[10.21,22.06]	5.70[3.847,8.378]	1.52[0.48,4.73]
Girls	28.9[20.85,38.54]	6.88[4.46,10.46]	6.42[3.63,10.94]	1.84[0.75,4.44]
Urban	28.97[22.66,36.23]	11.54[7.98,16.4]	6.67[4.7,9.38]	2.05[1.0,4.17]
Rural	31.87[23.98,40.95]	10.99 [5.256,21.55]	3.30[1.28,8.23]	0[0,0]
Total	29.52[24.14,35.54]	11.43 [8.228,15.68]	6.03[4.31,8.37]	1.66[0.8,3.43]
<b>Alborz</b>				
Boys	40.52[33.38,48.08]	23.71[17.6,31.14]	12.07 [8.209,17.4]	4.31[2.29,7.98]
Girls	33.87[27.93,40.37]	12.9 [9.24,17.74]	8.87[4.84,15.7]	1.21[0.41,3.5]
Urban	36.22[30.94,41.85]	17.84[13.35,23.43]	8.65 [5.796,12.72]	2.97[1.59,5.5]
Rural	40.0[30.94,49.8]	19.09[11.89,29.2]	16.36[9.03,27.83]	1.82[0.51,6.31]

Total	37.08[32.45,41.97]	18.13[14.17,22.89]	10.42[7.40,14.48]	2.71[1.54,4.73]
<b>Ilam</b>				
Boys	48.85[37.25,60.57]	23.85[17.95,30.95]	19.23 [13.0,27.5]	6.95[4.02,11.76]
Girls	44.09[36.02,52.49]	21.36[15.77,28.27]	34.09[25.87,43.4]	2.73[1.38,5.33]
Urban	44.5 [36.34,52.97]	21.0[16.33,26.58]	24.5 [18.07,32.31]	5.26[3.17,8.61]
Rural	57.5[39.52,73.69]	31.25[23.71,39.94]	33.75[25.21,43.5]	3.75[1.5,9.07]
Total	46.67[39.11,54.38]	22.71[18.43,27.64]	26.04[20.31,32.73]	5.0[3.18,7.82]
<b>Bushehr</b>				
Boys	30.28[23.95,37.46]	17.53[12.62,23.82]	7.17[4.362,11.57]	3.19[1.44,6.91]
Girls	33.33 [23.47,44.92]	15.28[9.55,23.54]	21.3[14.3,30.5]	4.63[1.92,10.76]
Urban	32.4[26.08,39.44]	17.72[13.48,22.93]	13.29[9.014,19.16]	4.2[2.32,7.47]
Rural	23.68[12.76,39.71]	2.63 [0.4741,13.3]	18.42 [7.99,36.99]	0[0,0]
Total	31.69[25.76,38.29]	16.49[12.47,21.48]	13.7[9.58,19.23]	3.85[2.12,6.91]
<b>Tehran</b>				
Boys	34.78[26.79,43.74]	26.41[19.57,34.6]	13.85[9.281,20.18]	6.93[3.35,13.77]
Girls	41.23[31.94,51.19]	17.03[11.54,24.41]	10.04 [5.105,18.81]	1.75[0.71,4.26]
Urban	38.48[31.95,45.45]	21.38[16.56,27.15]	11.8[8.07,16.95]	4.23[2.18,8.05]
Rural	18.18[13.99,23.28]	36.36[27.68,46.04]	18.18[13.99,23.28]	9.09[7.02,11.69]
Total	37.99[31.57,44.86]	21.74[16.96,27.42]	11.96[8.28,16.97]	4.35[2.31,8.03]
<b>Chaharmahal-Bakhtiyari</b>				
Boys	36.43[27.56,46.33]	23.7[18.54,29.77]	17.47[12.03,24.68]	4.44[2.32,8.34]
Girls	29.38[19.78,41.26]	22.75[14.2,34.38]	18.01[11.68,26.73]	3.32[1.78,6.09]
Urban	30.93[23.12,40.01]	22.46[16.32,30.06]	16.22[11.84,21.81]	5.09[3.13,8.18]
Rural	38.78[26.51,52.65]	25.17[16.71,36.06]	21.09[12.12,34.12]	1.36[0.37,4.91]
Total	33.33[26.51,40.93]	23.28[17.94,29.65]	17.71[13.33,23.14]	3.95[2.48,6.23]
<b>Razavi-Khorasan</b>				
Boys	30.0[20.19,42.07]	14.67[8.84,23.36]	3.33[1.565,6.96]	2.67[0.86,7.95]
Girls	25.33[19.54,32.16]	16.33[12.53,21.02]	9.33 [6.56,13.11]	2.33[0.97,5.49]
Urban	26.0[20.49,32.39]	15.43 [11.89,19.78]	6.86[4.69,9.91]	2.57[1.16,5.6]
Rural	30.0[17.82,45.87]	17.0[9.56,28.41]	9.0[4.25,18.04]	2.0[0.56,6.85]
Total	26.89[21.75,32.74]	15.78[12.51,19.71]	7.33[5.21,10.23]	2.44[1.22,4.83]
<b>North-Khorasan</b>				
Boys	24.63[18.86,31.49]	25.37[18.27,34.07]	9.56[6.14,14.57]	4.78[2.46,9.07]
Girls	28.02[22.71,34.03]	18.84[14.81,23.67]	10.68[6.19,17.8]	2.42[0.93,6.12]
Urban	26.7 [21.93,32.1]	24.15[18.68,30.62]	10.54[7.05,15.46]	4.83[2.75,8.35]
Rural	24.41[17.87,32.4]	18.11 [10.28,29.92]	8.66[4.28,16.74]	0.79[0.12,5.12]
Total	26.1[22.08,30.56]	22.55[17.82,28.1]	10.04[7.1,14.02]	3.76[2.15,6.49]
<b>Khozestan</b>				
Boys	45.06[35.64,54.86]	33.76[26.03,42.46]	18.45 [12.95,25.61]	6.47[4.0,10.29]
Girls	38.46 [27.57,50.64]	27.75 [20.24,36.76]	17.7[12.98,23.68]	3.35[1.44,7.59]
Urban	41.78[33.81,50.2]	31.9 [26.45,37.9]	17.74[13.69,22.67]	5.39[3.5,8.23]
Rural	42.86[24.05,63.98]	25.71 [11.48,48.02]	20.0[10.54,34.65]	2.86[0.44,16.32]
Total	41.95[34.48,49.81]	30.93[25.53,36.9]	18.1 [14.24,22.73]	4.99[3.24,7.61]
<b>Zanjan</b>				
Boys	28.19[20.18,37.88]	22.75[15.31,32.42]	9.0[5.88,13.52]	2.04[0.85,4.84]
Girls	36.36[27.96,45.69]	14.23[9.831,20.15]	14.29[9.9,20.18]	0.78[0.2,2.96]
Urban	28.83[22.29,36.39]	14.23[10.15,19.61]	13.93[9.96,19.15]	1.78[0.79,3.95]
Rural	40.0[28.54,52.67]	24.22[15.79,35.28]	8.70[4.46,16.29]	0.58[0.08,3.92]
Total	32.88[26.7,39.71]	17.87[13.5,23.28]	12.02[8.82,16.18]	1.33[0.62,2.81]
<b>Semnan</b>				
Boys	34.17[26.89,42.27]	22.5 [15.61,31.3]	5.46[3.06,9.55]	3.35[1.56,7.06]
Girls	35.71[29.54,42.4]	12.61[8.447,18.4]	5.46 [3.36,8.77]	2.94[1.56,5.47]
Urban	36.52 [31.39,41.98]	17.4[12.66,23.44]	5.42[3.68,7.92]	3.69[2.26,5.96]
Rural	25.71[14.78,40.85]	18.57[9.98,31.95]	5.71[1.70,17.56]	0[0,0]

Total	34.94[30.07,40.14]	17.57[13.23,22.97]	5.46 [3.75,7.90]	3.15[1.9,5.16]
<b>Sistan-Baluchestan</b>				
Boys	36.14[27.0,46.4]	24.75 [17.6,33.62]	30.2[22.43,39.3]	2.49[1.14,5.36]
Girls	30.77 [25.06,37.13]	28.74[22.51,35.91]	22.67[16.74,29.95]	2.85[1.31,6.06]
Urban	39.3[30.77,48.54]	31.88 [24.96,39.7]	27.07[19.68,36.0]	3.07[1.45,6.38]
Rural	26.82[21.02,33.53]	21.82[15.68,29.52]	25.0[18.22,33.27]	2.28[1.04,4.93]
Total	33.18[27.67,39.21]	26.95[22.03,32.5]	26.06[20.88,32.01]	2.69[1.55,4.6]
<b>Fars</b>				
Boys	26.7[20.67,33.74]	22.33[16.95,28.82]	6.8[3.66,12.27]	2.43[0.93,6.2]
Girls	40.15[33.51,47.17]	14.6[10.91,19.27]	12.41[8.294,18.16]	1.46[0.58,3.62]
Urban	32.57[26.96,38.73]	19.14 [15.5,23.41]	8.29[5.63,12.03]	1.43[0.53,3.82]
Rural	39.23[30.01,49.29]	14.62[8.123,24.89]	14.62[7.80,25.72]	3.08[1.34,6.92]
Total	34.38 [29.45,39.66]	17.92[14.52,21.91]	10.0[7.07,13.96]	1.88[0.95,3.65]
<b>Qazvin</b>				
Boys	31.12[23.16,40.38]	26.14[19.7,33.79]	11.62[7.26,18.09]	6.64[3.72,11.57]
Girls	32.22 [26.38,38.67]	15.9[10.59,23.19]	15.9[9.98,24.37]	0.42[0.06,2.86]
Urban	32.78 [26.64,39.57]	20.56[15.59,26.6]	13.06[9.41,17.83]	3.89[2.1,7.09]
Rural	28.33[20.75,37.38]	22.5[13.23,35.61]	15.83[6.77,32.76]	2.5[0.36,15.23]
Total	31.67[26.59,37.22]	21.04[16.48,26.47]	13.75[9.86,18.86]	3.54[1.92,6.44]
<b>Qom</b>				
Boys	36.71[29.18,44.94]	20.92[15.2,28.08]	11.86[7.9,17.44]	2.93[1.05,7.94]
Girls	34.73[29.54,40.31]	12.97[9.95,16.75]	7.53[4.66,11.95]	0.42[0.06,2.88]
Urban	35.53[30.73,40.63]	16.59[13.05,20.87]	9.45 [6.77,13.05]	1.75[0.68,4.42]
Rural	40.0[40.0,40.0]	25.0[18.66,32.64]	15.0[9.24,23.42]	0[0,0]
Total	35.71[31.1,40.61]	16.95[13.49,21.07]	9.68[7.07,13.14]	1.68[0.65,4.25]
<b>Kordestan</b>				
Boys	31.46[23.74,40.37]	18.35[13.5,24.46]	18.35[13.37,24.67]	1.5[0.6,3.69]
Girls	45.07[35.73,54.77]	14.55[9.412,21.83]	20.19 [12.77,30.41]	3.29[1.56,6.8]
Urban	39.09[30.91,47.94]	19.39[14.58,25.33]	18.79[13.2,26.03]	2.74[1.43,5.17]
Rural	34.0[24.78,44.61]	10.67[6.76,16.43]	20.0 [13.22,29.1]	1.33[0.36,4.83]
Total	37.5[31.05,44.42]	16.67[12.92,21.23]	19.17 [14.61,24.73]	2.3[1.28,4.1]
<b>Kerman</b>				
Boys	23.41[17.73,30.25]	19.51[13.88,26.73]	9.9 [6.61,14.57]	1.48[0.51,4.19]
Girls	32.16[23.83,41.79]	15.69[10.82,22.2]	6.69[4.42,10.02]	2.36[1.01,5.44]
Urban	27.59[21.03,35.27]	18.62[13.77,24.69]	7.27[5.101,10.25]	1.39[0.55,3.46]
Rural	29.41[20.39,40.4]	15.29[9.25,24.23]	9.58[5.38,16.49]	2.96[1.15,7.38]
Total	28.26 [22.89,34.33]	17.39[13.4,22.26]	8.11 [5.86,11.14]	1.97[1.0,3.83]
<b>Kermanshah</b>				
Boys	38.85[29.96,48.54]	21.15[16.04,27.36]	10.47[7.49,14.44]	5.0[2.75,8.93]
Girls	39.73[32.4,47.54]	21.46 [15.57,28.82]	17.35[10.99,26.3]	1.83[0.48,6.75]
Urban	36.67[30.6,43.19]	22.82[18.45,27.87]	12.89[9.0,18.11]	3.85[2.08,7.01]
Rural	50.56[33.0,67.98]	14.61[7.06,27.82]	16.85[9.34,28.52]	2.25[0.65,7.5]
Total	39.25[33.1,45.75]	21.29[17.25,25.99]	13.63[10.02,18.27]	3.55[2.02,6.16]
<b>Kohgiluyeh</b>				
Boys	40.8 [29.69,52.92]	23.88[17.89,31.11]	17.41[11.71,25.11]	1.99[0.64,6.03]
Girls	33.6[26.61,41.4]	17.41[11.0,26.44]	14.98[10.88,20.28]	2.83[1.2,6.53]
Urban	29.51[23.48,36.36]	19.1[13.34,26.58]	12.5[9.313,16.58]	3.13[1.44,6.66]
Rural	50.0 [37.62,62.38]	22.5[15.27,31.87]	22.5[15.27,31.87]	1.25[0.33,4.56]
Total	36.83[30.33,43.84]	20.31[15.6,26.01]	16.07[12.44,20.52]	2.46[1.24,4.82]
<b>Golestan</b>				
Boys	40.15[33.41,47.28]	32.34[25.82,39.63]	15.61[10.91,21.85]	4.09[2.35,7.03]
Girls	38.86[30.79,47.6]	18.96[14.1,25.0]	8.06[4.62,13.69]	0.95[0.25,3.52]
Urban	37.04 [30.91,43.62]	24.07[18.45,30.76]	6.67 [4.04,10.8]	1.48[0.59,3.67]
Rural	42.86[33.35,52.93]	29.52[21.96,38.41]	19.52[13.27,27.79]	4.29[2.36,7.65]
Total	39.58[34.05,45.39]	26.46[21.7,31.83]	12.29 [8.74,17.01]	2.71[1.61,4.52]
<b>Gilan</b>				

Boys	28.08[21.24,36.11]	15.38[10.79,21.47]	4.23[2.23,7.88]	4.62[2.44,8.55]
Girls	37.73[29.81,46.36]	20.0[14.37,27.13]	9.55[5.48,16.12]	2.73[1.18,6.2]
Urban	31.62[25.79,38.1]	18.11[13.85,23.32]	7.03[4.26,11.38]	2.97[1.6,5.47]
Rural	35.45[23.1,50.11]	15.45 [8.65,26.08]	5.46 [2.28,12.5]	6.36[2.73,14.13]
Total	32.5 [27.04,38.48]	17.5[13.73,22.04]	6.67[4.30,10.19]	3.75[2.25,6.19]
<b> Lorestan</b>				
Boys	47.2[32.05,62.88]	16.8[11.82,23.33]	16.0 [10.05,24.51]	4[1.36,11.2]
Girls	54.0[39.43,67.91]	15.0 [7.74,27.07]	13.0 [3.28,39.74]	0[0,0]
Urban	49.09[37.73,60.55]	15.76[11.74,20.82]	15.15[7.62,27.87]	3.07[1.08,8.44]
Rural	53.33 [22.4,81.9]	16.67 [6.658,35.93]	13.33[6.27,26.13]	0[0,0]
Total	50.22[37.81,62.61]	16.0[11.57,21.7]	14.67[8.48,24.18]	2.25[0.75,6.55]
<b> Mazandaran</b>				
Boys	23.11[17.07,30.49]	22.69[17.58,28.77]	6.72[4.24,10.49]	2.11[0.96,4.57]
Girls	31.03[23.65,39.53]	17.24[11.29,25.43]	6.47 [3.62,11.28]	3.88[1.77,8.3]
Urban	26.22[20.72,32.57]	21.08[16.23,26.92]	6.76[4.48,10.07]	2.98[1.6,5.49]
Rural	30.0[18.43,44.85]	16.0[9.186,26.4]	6.0[2.96,11.77]	3.0[0.77,10.95]
Total	27.02 [21.89,32.86]	20.0[15.77,25.02]	6.60[4.61,9.35]	2.99[1.69,5.21]
<b> Markazi</b>				
Boys	37.99[30.17,46.49]	25.09[20.13,30.81]	13.26[9.564,18.1]	2.88[1.32,6.17]
Girls	38.81[30.42,47.91]	14.43[9.56,21.2]	12.44 [7.66,19.57]	1.49[0.51,4.26]
Urban	36.49[30.53,42.89]	19.19[14.88,24.4]	10.81[7.54,15.26]	1.9[0.78,4.53]
Rural	44.55[28.62,61.68]	25.45[17.55,35.38]	20.0[14.47,26.97]	3.64[1.63,7.9]
Total	38.33[32.28,44.77]	20.63[16.68,25.22]	12.92[9.84,16.78]	2.3[1.21,4.31]
<b> Hormozgan</b>				
Boys	23.08[15.01,33.76]	27.97[17.7,41.22]	13.29[7.715,21.93]	1.41[0.37,5.18]
Girls	36.22 [25.94,47.94]	33.07 [23.07,44.88]	19.69[12.07,30.44]	3.15[1.02,9.34]
Urban	30.0 [19.25,43.51]	27.69[16.8,42.07]	14.62[8.38,24.26]	0.78[0.13,4.43]
Rural	28.57[20.46,38.34]	32.86[23.4,43.94]	17.86[10.78,28.12]	3.57[1.42,8.72]
Total	29.26[22.3,37.34]	30.37[22.83,39.14]	16.3[11.24,23.03]	2.23[0.96,5.1]
<b> Hamedan</b>				
Boys	30.42[23.32,38.58]	20.0[14.03,27.69]	12.13[8.917,16.3]	1.67[0.36,7.31]
Girls	37.08[29.34,45.55]	15.83[11.25,21.82]	17.57[12.11,24.8]	1.67[0.53,5.13]
Urban	30.95[25.26,37.27]	18.05 [13.29,24.05]	12.36[9.18,16.44]	2.01[0.7,5.61]
Rural	41.22 [29.23,54.36]	17.56[11.73,25.44]	21.54 [14.05,31.56]	0.76[0.11,4.98]
Total	33.75[28.27,39.71]	17.92[13.99,22.66]	14.85[11.5,18.98]	1.67[0.64,4.26]
<b> Yazd</b>				
Boys	19.64[13.86,27.08]	12.14[8.462,17.12]	4.66 [2.29,9.23]	1.79[0.8,3.96]
Girls	18.5[12.55,26.41]	11.5[8.04,16.19]	5.5[2.12,13.54]	1.5[0.36,5.99]
Urban	16.19[12.57,20.6]	10.95[8.258,14.39]	3.1 [1.86,5.12]	1.67[0.75,3.66]
Rural	40.0[23.0,59.8]	18.33[10.43,30.2]	18.33 [6.95,40.27]	1.67[0.27,9.65]
Total	19.17[14.81,24.44]	11.88[9.18,15.24]	5.01[2.81,8.79]	1.67[0.8,3.44]

Data are presented as percentage (95% CI)