**Supplementary Figure 1.** Weighted prevalence of underreporting, plausible reporting, and over-reporting by dietary reference intake (DRI) age and sex categories using the ±1SD and ±2SD cut-off points for identifying misreporters (side-by-side comparison) among Canadians ≥12 years\*

F, Females; M, Males.

\*±1SD cut-off for plausible reporting: 0.7≤Energy Intake (EI)/Estimated Energy Requirement (EER)≤1.42 ; ±2SD cut-off for plausible reporting: 0.5≤EI/EER≤ 1.98

**Supplementary Figure 2.** The association of age with the ratio of Energy intake (EI) to estimated energy requirement (EER) by sex among Canadians ≥ 12 years\*

F, Females; M, Males.

\*Estimates are weighted and variances are bootstrapped using the Balance Repeated Replication technique

**Supplementary Figure 3.** Agreement of self-assessed validity of dietary intakes (subjective) and intakes assessed using the ±1SD cut-off point for misreporting (objective)\*,†

\*Estimates are weighted

†±1SD cut-off for plausible reporting: 0.7≤Energy Intake (EI)/Estimated Energy Requirement (EER)≤1.42

 **Supplementary Figure 1.**

**Supplementary Figure 2. **

**Supplementary Figure 3.**

1. **Adults**
2. **Adolescents**

**Supplementary Table 1.** Descriptive weighted analysis of covariates (row percentages) stratified by the reporting group (differential misreporting) among Canadian adolescents (12-17 years) (n=3974)\*,†,‡

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Characteristics**  | **Under-reporters§** | **Plausible reporters‖** | **Over-reporters¶** | **P-value** |
| **Weighted Mean/ %** | **SE** | **Weighted Mean/ %** | **SE** | **Weighted Mean/ %** | **SE** |  |
| **Sex** ,% |  |  |  |  |  |  |  |
|  | Males | 21.68 | 1.52 | 60.06 | 1.80 | 18.25 | 1.47 | 0.078 |
| Females | 18.19 | 1.46 | 58.96 | 2.05 | 22.85 | 1.71 |
| **Age**, yr | 14.56 | 0.12 | 14.47 | 0.07 | 14.20 | 0.11 | 0.060 |
| **Body mass index**, kg/m2 | 25.05 | 0.31 | 21.86 | 0.16 | 20.13 | 0.19 | <0.0001 |
| **Physical activity** ,% |  |  |  |  |  |  |  |
|     | Inactive | 15.88 | 3.58 | 51.20 | 5.49 | 32.92 | 5.64 | 0.0008 |
| Moderately active | 18.85 | 1.16 | 60.58 | 1.49 | 20.57 | 1.30 |
| High/very highly active | 25.15 | 2.33 | 59.09 | 2.62 | 15.77 | 1.93 |
| **Province of residence** ,% |  |  |  |  |  |  |
|        | NFLD,PEI,NS,NB | 25.56 | 2.91 | 56.47 | 3.03 | 17.97 | 2.09 | <0.0001 |
| QC | 12.46 | 2.01 | 55.93 | 3.47 | 31.61 | 3.44 |
| ON | 21.49 | 1.83 | 60.54 | 2.03 | 17.97 | 1.62 |
| MB,SK | 20.18 | 1.93 | 61.19 | 2.44 | 18.64 | 1.97 |
| AB | 21.69 | 3.06 | 66.34 | 3.45 | 11.97 | 2.86 |
| BC | 24.21 | 2.98 | 57.91 | 3.25 | 17.88 | 2.62 |
| **Highest household education** ,% |  |  |  |  |
|  | <Secondary education | 21.36 | 4.55 | 58.57 | 5.66 | 20.06 | 5.09 | 0.088 |
| Secondary education | 24.43 | 3.03 | 60.98 | 3.50 | 14.59 | 2.65 |
| Some post-secondary education | 18.94 | 3.78 | 68.06 | 4.57 | 13.00 | 2.73 |
| Post-secondary education | 19.41 | 1.21 | 58.42 | 1.52 | 22.17 | 1.34 |
| **Income adequacy** ,% |  |  |  |  |  |  |  |
|  | Lowest | 30.76 | 5.24 | 47.36 | 4.96 | 21.89 | 4.08 | 0.029 |
| Lower middle | 19.28 | 2.43 | 56.90 | 3.43 | 23.82 | 3.13 |
| Upper middle | 20.02 | 1.81 | 58.36 | 2.28 | 21.63 | 2.17 |
| Highest | 17.25 | 1.91 | 63.74 | 2.53 | 19.01 | 2.07 |
| N/S | 19.82 | 2.17 | 64.06 | 3.03 | 16.12 | 2.48 |
| **Drank alcohol in past 12 months** ,% |  |  |  |  |  |  |
|  | Yes | 21.61 | 1.63 | 61.87 | 1.91 | 16.53 | 1.44 | 0.009 |
|  | No | 19.09 | 1.27 | 58.15 | 1.60 | 22.76 | 1.53 |
| **Immigration status** ,% |  |  |  |  |  |  |  |
|  | Canadian born | 20.13 | 1.10 | 59.77 | 1.33 | 20.10 | 1.15 | 0.625 |
| Immigrant | 18.93 | 3.94 | 56.90 | 5.38 | 24.17 | 5.06 |
| **Smoking status** ,% |  |  |  |  |  |  |  |
|  | Daily  | 24.62 | 5.29 | 56.42 | 5.77 | 18.96 | 3.74 | 0.596 |
| Occasional  | 23.62 | 6.02 | 50.41 | 7.49 | 25.97 | 8.16 |
| Former | 28.95 | 8.08 | 49.39 | 8.61 | 21.67 | 7.22 |
| Never smoked | 19.46 | 1.06 | 60.28 | 1.30 | 20.26 | 1.17 |
| **Self-perceived health status**  ,% |
|  | Poor/fair | 28.85 | 5.21 | 58.02 | 5.61 | 13.13 | 3.98 | 0.003 |
| Good | 27.32 | 2.65 | 53.30 | 3.08 | 19.38 | 2.44 |
| Very good | 17.29 | 1.39 | 62.23 | 2.00 | 20.48 | 1.87 |
| Excellent | 16.55 | 2.12 | 60.96 | 2.52 | 22.49 | 2.08 |
| **Aboriginal of North America** ,% |  |
|  | Yes | 27.48 | 6.39 | 55.73 | 7.00 | 16.79 | 4.40 | 0.431 |
| No | 19.89 | 1.03 | 59.61 | 1.26 | 20.50 | 1.12 |  |

AB, Alberta; BC, British Columbia; MB, Manitoba; NB, New Brunswick; NFLD, Newfoundland; NS, Nova Scotia; ON, Ontario; PEI, Prince Edward Island; QC, Quebec; SE, Standard Error; SK, Saskatchewan

\*Estimates are weighted means and bootstrapped variances (Balanced Repeated Replication technique)

†For adolescents 12-17 years of age, Cole et al.’s categories was used to define obesity (22)

‡The following variables are only presented in adults due to either having small frequencies or not being applicable to adolescents: self-reported diabetes, self-reported hypertension, self-reported heart disease, having at least one chronic condition, marital status, and self-perceived level of stress.

§Under-reporters: Individuals whose energy intake (EI) was less than 70% of their estimated energy requirement (EER)

‖Plausible reporters: Individuals whose EI was between 70% and 142% of their EER

¶Over-reporters: Individuals whose EI was more than 142% of their EER

**Supplementary Table 2.** Association between overweight and obesity risk with dietary determinants of obesity as set by the World Health Organization (WHO) among Canadian adolescents (12-17 years)\*,†,‡,§

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Dietary Variables** | **Basic model** **(n=3974)** **(Model I)‖** | **Basic model adjusted for covariates** **(n=3974)****(Model II)¶** | **Excluding misreporters (n=2380)****(Model III)\*\*** | **Adjusting for the reporting group (n=3974)****(Model IV)††** | **Adjusting for propensity score (n=3974)****(Model V)‡‡** | **Adjusting for the reporting group and propensity score (n=3974)****(Model VI)§§** |
|  | **OR**  | **95%CI** | **OR**  | **95%CI** | **OR**  | **95%CI** | **OR**  | **95%CI** | **OR**  | **95%CI** | **OR**  | **95%CI** |
| Energy intake (1 unit=100 kcal), overweight | 0.979  | 0.964, 0.994 | 0.980  | 0.964, 0.995 | 1.077  | 1.044, 1.110 | 1.068  | 1.045, 1.092 | 0.982  | 0.967, 0.996 | 1.069  | 1.045, 1.093 |
| Energy intake (1 unit=100 kcal), obesity | 0.960  | 0.940, 0.980 | 0.964  | 0.944, 0.984 | 1.132  | 1.091, 1.175 | 1.084  | 1.049, 1.120 | 0.964  | 0.945, 0.984 | 1.084  | 1.049, 1.121 |
| Fiber density, g/1000kcal, overweight | 0.998  | 0.955, 1.043 | 0.999  | 0.954, 1.047 | 0.942  | 0.890, 0.996 | 0.978  | 0.938, 1.020 | 0.999  | 0.956, 1.044 | 0.980  | 0.939, 1.022 |
| Fiber density, g/1000kcal, obesity | 0.987  | 0.931, 1.046 | 1.004  | 0.950, 1.060 | 0.935  | 0.815, 1.072 | 0.958  | 0.901, 1.019 | 0.990  | 0.932, 1.051 | 0.961  | 0.903, 1.024 |
| %E from solid fat and added sugar (SoFAS), overweight | 1.002  | 0.996, 1.009 | 1.002  | 0.995, 1.009 | 1.007  | 0.998, 1.017 | 1.005  | 0.998, 1.012 | 1.002  | 0.995, 1.008 | 1.004  | 0.998, 1.011 |
| %E from solid fat and added sugar (SoFAS), obesity | 0.994  | 0.985, 1.003 | 0.993  | 0.982, 1.003 | 1.006  | 0.992, 1.021 | 0.998  | 0.988, 1.008 | 0.993  | 0.983, 1.002 | 0.996  | 0.986, 1.006 |
| % E from fruits & vegetables, overweight | 0.988  | 0.958, 1.020 | 0.988  | 0.957, 1.020 | 0.981  | 0.941, 1.023 | 0.982  | 0.952, 1.012 | 0.991  | 0.960, 1.022 | 0.983  | 0.954, 1.013 |
| % E from fruits & vegetables, obesity | 0.961  | 0.922, 1.001 | 0.974  | 0.936, 1.013 | 0.974  | 0.914, 1.039 | 0.955  | 0.919, 0.992 | 0.966  | 0.928, 1.006 | 0.959  | 0.922, 0.997 |
| Total energy density, kcal/g, overweight  | 0.408  | 0.252, 0.661 | 0.416  | 0.248, 0.697 | 0.600  | 0.299, 1.204 | 0.807  | 0.500, 1.303 | 0.432  | 0.266, 0.701 | 0.817  | 0.506, 1.317 |
| Total energy density, kcal/g, obesity | 0.311  | 0.160, 0.602 | 0.263  | 0.128, 0.543 | 0.914  | 0.356, 2.347 | 0.892  | 0.502, 1.586 | 0.344  | 0.180, 0.660 | 0.909  | 0.514, 1.610 |
| Food-based energy density, kcal/g, overweight | 1.021  | 0.832, 1.252) | 0.988  | 0.796, 1.227 | 1.218  | 0.935, 1.587 | 1.100  | 0.899, 1.347 | 1.006  | 0.817, 1.238 | 1.088  | 0.885, 1.338 |
| Food-based energy density, kcal/g, obesity | 0.874  | 0.682, 1.119 | 0.816  | 0.627, 1.061 | 1.223  | 0.838, 1.786 | 0.969  | 0.768, 1.221 | 0.854  | 0.670, 1.090 | 0.951  | 0.756, 1.195 |

%E, % of Energy intake; 95%CI, 95% Confidence interval; OR, Odds ratio.

\*Estimates are weighted and variances are bootstrapped using the Balance Repeated Replication technique

†For adolescents 12-17 years of age, Cole et al.’s categories was used to define obesity(22)

‡For the propensity score, 0.01 unit offset from mean was chosen due to its small scale and for the energy intake a 100-unit offset from mean was considered. All other continuous variables were assessed based on 1-unit offset from the mean

§Under-reporters: Individuals whose energy intake (EI) was less than 70% of their estimated energy requirement (EER); Plausible reporters: Individuals whose EI was between 70% and 142% of their EER; Over-reporters: Individuals whose EI was more than 142% of their EER

‖Model I: Weighted multinominal logistic regression adjusted for age and sex

¶Model II: Model I additionally adjusted for physical activity, drinking alcohol in the past 12 months, highest household education, self-reported health, smoking status, province of residence, and income adequacy

\*\*Model III: Basic model but excluding under-reporters and over-reporters

††Model IV: Basic model adjusted for the reporting groups (under-reporters, plausible reporters, over-reporters)

‡‡Model V: Basic model adjusted for propensity score

§§Model VI: Basic model adjusted for both propensity score and the reporting group

**Supplementary Table 3.** Association between overweight and obesity with dietary determinants of obesity as set by the World Health Organization (WHO) in different models stratified by the reporting group among Canadian adolescents (12-17 years)\*,†,‡

|  |  |  |
| --- | --- | --- |
| **Dietary variables**  | **Stratification (Model VII)§** | **Stratification and adjustment for propensity score (Model VIII)‖** |
| **Under-reporter (n=861)** | **Plausible reporter (n=2380)** | **Over-reporter** **(n=733)** | **Under-reporter (n=861)** | **Plausible reporter (n=2380)** | **Over-reporter** **(n=733)** |
| **OR** | **95%CI** | **OR** | **95%CI** | **OR** | **95%CI** | **OR** | **95%CI** | **OR** | **95%CI** | **OR** | **95%CI** |
| Energy intake (1 unit=100 kcal), overweight | 1.114  | 1.037,1.197 | 1.077  | 1.044,1.110 | 1.059  | 1.019,1.100 | 1.114  | 1.036,1.197 | 1.078  | 1.046,1.112 | 1.058  | 1.019,1.100 |
| Energy intake (1 unit=100 kcal), obesity | 1.172  | 1.071,1.283 | 1.132  | 1.091,1.175 | 1.013  | 0.944,1.088 | 1.175  | 1.072,1.287 | 1.136  | 1.095,1.177 | 1.013  | 0.946,1.085 |
| Fiber density, g/1000 kcal, overweight  | 1.044  | 0.967,1.128 | 0.942  | 0.890,0.996 | 0.947  | 0.824,1.088 | 1.044  | 0.966,1.129 | 0.945  | 0.894,0.999 | 0.943  | 0.820,1.083 |
| Fiber density, g/1000 kcal, obesity  | 1.013  | 0.948,1.082 | 0.935  | 0.815,1.072 | 0.792  | 0.648,0.969 | 1.016  | 0.950,1.088 | 0.940  | 0.817,1.081 | 0.793  | 0.648,0.970 |
| %E from solid fat and added sugar (SoFAS), overweight | 0.994  | 0.983,1.007 | 1.007  | 0.998,1.017 | 1.016  | 1.000,1.033 | 0.995  | 0.982,1.007 | 1.006  | 0.997,1.016 | 1.017  | 1.001,1.033 |
| %E from solid fat and added sugar (SoFAS), obesity | 0.985  | 0.970,1.000 | 1.006  | 0.992,1.021 | 1.006  | 0.983,1.029 | 0.984  | 0.968,1.000 | 1.005  | 0.991,1.019 | 1.006  | 0.984,1.029 |
| % E from fruits & vegetables, overweight | 0.991  | 0.946,1.038 | 0.981  | 0.941,1.023 | 0.892  | 0.736,1.080 | 0.990  | 0.945,1.038 | 0.985  | 0.945,1.027 | 0.891  | 0.737,1.078 |
| % E from fruits & vegetables, obesity | 0.957  | 0.913,1.002 | 0.974  | 0.914,1.039 | 0.759  | 0.343,1.679 | 0.959  | 0.914,1.005 | 0.980  | 0.919,1.046 | 0.760  | 0.362,1.595 |
| Total energy density, kcal/g, overweight  | 0.908  | 0.360,2.293 | 0.600  | 0.299,1.204 | 1.839  | 0.644,5.250 | 0.907  | 0.360,2.284 | 0.614  | 0.305,1.232 | 1.845  | 0.645,5.275 |
| Total energy density, kcal/g, obesity | 0.668  | 0.293,1.521 | 0.914  | 0.356,2.347 | 7.502  | 1.462,38.507 | 0.665  | 0.289,1.527 | 0.945  | 0.368,2.429 | 7.496  | 1.499,37.488 |
| Food-based energy density, kcal/g overweight | 0.736 | 0.506,1.071 | 1.218 | 0.935,1.587 | 1.926) | 1.159,3.203 | 0.737 | 0.503,1.082 | 1.194 | 0.917,1.556 | 1.918 | 1.127,3.261 |
| Food-based energy density, kcal/g, obesity | 0.654 | 0.460,0.930 | 1.223 | 0.838,1.786 | 1.467 | 0.766,2.807 | 0.645 | 0.453,0.918 | 1.191 | 0.821,1.728 | 1.455 | 0.717,2.955 |

%E, % of Energy intake; 95%CI, 95% Confidence interval; OR, Odds ratio.

\*Estimates are weighted and variances are bootstrapped using the Balance Repeated Replication technique

†For adolescents 12-17 years of age, Cole et al.’s categories was used to define obesity(22)

‡Under-reporters: Individuals whose energy intake (EI) was less than 70% of their estimated energy requirement (EER); Plausible reporters: Individuals whose EI was between 70% and 142% of their EER; Over-reporters: Individuals whose EI was more than 142% of their EER

§Basic model (adjusted for age and sex) stratified by underreporting, plausible reporting and over-reporting

‖Basic model (adjusted for age and sex) additionally adjusted for the propensity score and stratified by underreporting, plausible reporting and over-reporting