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**Supplementary table 1**: 44 food groups and their corresponding food items in the food frequency questionnaire (FFQ)

|  |  |  |  |
| --- | --- | --- | --- |
| **Food or food groups** | **Food item in FFQ** | **Food or food groups** | **Food item in FFQ** |
| **Brown rice** | Boiled, steamed unpolished rice | **Noodles in soup** | Rice noodle dish - Soup Wheat noodle dish – Soup  Instant noodles |
| **Buns with sweet/savoury fillings and ethnic bread (fried and steamed)** | Buns with sweet filling fruits and nuts Buns with curry meat fillings  Fried ethnic breads (e.g. Roti prata)  Steamed/baked ethnic breads (e.g. chapatti, thosai) | **Nuts and legumes** | Nuts dry/roasted/ raw/ fried  (e.g. walnut, almond)  Legumes - stir fried/ stewed/ steamed/ in soup |
| **Bread spreads** | Butter Margarine  Peanut butter Kaya Chocolate spread Jam Honey | **Oily and non-oily fish (H)\*** | Oily/non oily fish - stir fried/ pan fried/ curry without coconut Oily/non oily fish – raw/ steamed/ boiled/ in soup Oily/non oily fish- grilled/ BBQ/ baked |
| **Canned / dried fruits** | Canned/ tinned fruits Dried fruits (e.g. raisins, dates) | **Oily and non-oily fish (LH)\*** | Oily/non oily fish - deep fried Oily/non oily fish - curry with coconut |
| **Cereals, oats, cereal drinks and other cereals** | Breakfast cereals (plain, flavoured)  Oats oatmeal cooked/ High fibre cereal  Cereal drinks (e.g. 3 in 1 cereal drinks)  Other cereals (e.g. corn, semolina, uppuma) | **Pasta** | Pasta/ Spaghetti |
| **Cheese** | Cheese/ cheese spread | **Plain/cream biscuits** | Plain biscuits/plain crackers/ wholemeal biscuits Cream filled biscuits / shortbread cookies |
| **Chocolate** | Chocolate | **Poultry and meat (H)\*** | Poultry - stir fried/ pan fried/ stewed/ braised Poultry – steamed/ boiled/ in soup Poultry – BBQ/ grilled/ baked  Pork - stir fried/pan fried/stewed/braised Pork - steamed/boiled in soup Pork – BBQ/grilled/baked  Meat - stir fried/pan fried/stewed/braised Meat - steamed/boiled in soup  Meat - BBQ/grilled/baked |
| **Food or food groups** | **Food item in FFQ** | **Food or food groups** | **Food item in FFQ** |
| **Coffee/tea/decaffeinated drinks** | Coffee regular Tea, regular Decaffeinated coffee/tea, herbal tea | **Poultry and meat (LH)\*** | Poultry - deep fried Poultry - curry with coconut  Pork - deep fried Meat - deep fried Meat - curry with coconut |
| **Desserts in soup** | Desserts in soup with coconut milk  (e.g. chendol, ice kachang) Desserts in soup without coconut milk  (e.g. green/red bean soup) | **Porridge** | Plain white rice porridge Flavoured porridge (e.g. chicken, fish porridge) |
| **Dim sum** | Dim sum–steamed (chee cheong fun, dumplings)  Dim sum–fried /deep fried (e.g. spring roll) | **Sausages/ ham/ bacon** | Sausages Ham bacon/ ‘bak kua’ (pork or beef jerky) |
| **Eggs** | Boiled poached steamed eggs  Fried egg, scrambled egg, egg omelette  \*Eggs from chicken, duck and quail sources | **Savoury/sweet snacks (steamed/baked), pastries and cakes** | Kueh kueh (steamed or baked, e.g. kueh lapis, kueh salat) / sweet traditional Indian snacks (e.g. halwa, burfi)  Puff flaky pastries (e.g. croissants, curry puffs) Sponge cakes/ butter cake/ cream cake/ fruit cake |
| **Fast food** | Burgers (inclusive of meat patties)  Chicken and fish nuggets  Fried potatoes (e.g. French fries)  Pizza | **Seafood and canned fish** | Other seafood (e.g. prawn, squid, clams, mussels)  Canned fish (e.g. canned sardine, canned tuna) |
| **Flavoured noodles** | Rice noodle dish - Stir fried or dry Rice noodle dish - Gravy Wheat noodle dish - Stir fried or dry Wheat noodle dish - Gravy | **Soups** | Clear soup /broth  Cream soup |
| **Flavoured rice** | Flavoured rice dishes (e.g. Fried rice, Chicken rice, Nasi Lemak) | **Soy products** | Tofu and beancurd  Soya milk |
| **Fresh fruits** | Citrus fruits (e.g. oranges, mandarins) Apples and pears, Bananas Grapes and berries Stone fruits (e.g. peach, plum) Tropical fruits (e.g. mango, papaya) | **Sweetened beverages** | Sweetened beverages |
| **Food or food groups** | **Food item in FFQ** | **Food or food groups** | **Food item in FFQ** |
| **Fried snacks** | Fried snacks (e.g. dough fritters, goreng pisang, pakora)  Fried salty snacks (consumed as titbits)  e.g. Crisps, chips, prawn crackers (ultra-processed products) | **Vegetable salad** | Vegetable salad (plain) Vegetable salad (in oil based dressing) Vegetable salad (in cream dressing) |
| **Fruit juice** | Fresh fruit juice | **Vegetables (H)\*** | Cabbage - stir fried/ stewed Cabbage – steamed/ in soup Dark green leafy vegetable - stir fried /stewed Dark green leafy vegetable – steamed/ in soup Broccoli cauliflower - stir fried/stewed Broccoli cauliflower – steamed/in soup Tomatoes - stir fried/stewed Tomatoes – steamed/ in soup Carrots - stir fried/ stewed Carrots - steamed/ in soup  Beansprouts - stir fried/ stewed Beansprouts – steamed/ in soup Peas and green beans - stir fried/ stewed Peas and green beans – steamed/ in soup Pumpkin - stir fried/ stewed Pumpkin – steamed/ in soup Mushrooms - stir fried/ stewed Mushrooms – steamed/ in soup Okra, eggplant, bitter gourd - stir fried/ stewed Okra, eggplant, bitter gourd – steamed/ in soup Potato (boiled, stir fried) |
| **Full fat milk** | Full cream milk (fresh, UHT, powdered)  Milk consumed with cereals | **Vegetables (LH)\*** | Cabbage – curry with coconut Dark green leafy vegetable – curry with coconut  Pumpkin - curry Okra, eggplant, bitter gourd – curry with coconut |
| **Ice-cream** | Ice- cream | **White bread** | White bread or rolls |
| **Food or food groups** | **Food item in FFQ** | **Food or food groups** | **Food item in FFQ** |
| **Innards** | Animal liver and other innards | **White rice** | Boiled, steamed white rice |
| **Low fat milk/ formula milk** | Skimmed/ low fat milk (fresh, UHT powdered)  Formula milk (for adults) | **Wholemeal bread** | Wholemeal bread / soft meal bread / multigrain bread |
| **Malted beverages** | Malt beverages | **Yoghurt/cultured/dairy drinks** | Other dairy based drinks Cultured drinks  Yoghurt regular/ low fat |

\* (H): Healthy, (LH): Less healthy

**Supplementary Table 2:** Comparison of characteristics of participants in the overall cohort (n=1032), those with completed FFQ (n=1007) and validation subset (n=289)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Overall cohort (n=1032) †** | | **Cohort with available FFQ (n=1007) ‡** | | **Validation subset (n=289) §** | | **P-value** |
|  | n | % | n | % | n | % |
| **Maternal age (years)** |  |  |  |  |  |  | **< 0.001** |
| < 30 | 496 | 48.1 | 485 | 48.2 | 108 | 37.4 |  |
| 30- 34 | 386 | 37.4 | 377 | 37.4 | 106 | 36.7 |  |
| > = 35 | 150 | 14.5 | 145 | 14.4 | 75 | 26.0 |  |
| **Ethnicity** |  |  |  |  |  |  | 0.380 |
| Chinese | 743 | 72.0 | 722 | 71.7 | 222 | 76.8 |  |
| Malay | 159 | 15.4 | 158 | 15.7 | 38 | 13.2 |  |
| Indian | 95 | 9.2 | 93 | 9.2 | 22 | 7.6 |  |
| Mix | 35 | 3.4 | 34 | 3.4 | 7 | 2.4 |  |
| **Highest educational attainment** |  |  |  |  |  |  | 0.576 |
| Below Degree level | 384 | 37.7 | 379 | 37.6 | 114 | 39.5 |  |
| Degree level and above | 635 | 62.3 | 628 | 62.4 | 175 | 60.6 |  |
| **Monthly household income** |  |  |  |  |  |  | 0.229 |
| Q1 & Q2 | 255 | 30.4 | 254 | 30.5 | 89 | 34.5 |  |
| Q3 | 260 | 31.0 | 260 | 31.2 | 85 | 32.9 |  |
| Q4 & Q5 | 323 | 38.5 | 319 | 38.3 | 84 | 32.6 |  |
| **Parity** |  |  |  |  |  |  | 0.539 |
| Nulliparous | 656 | 65.0 | 652 | 64.8 | 181 | 62.9 |  |
| Parous | 354 | 35.1 | 354 | 35.2 | 107 | 37.2 |  |
| **Alcohol consumption** |  |  |  |  |  |  | 0.788 |
| Never drinkers | 337 | 32.7 | 315 | 31.3 | 88 | 30.5 |  |
| Ever drinkers | 695 | 67.3 | 692 | 68.7 | 201 | 69.6 |  |
| **Smoking status** |  |  |  |  |  |  | 0.738 |
| Never smokers | 904 | 89.4 | 900 | 89.4 | 262 | 90.7 |  |
| Previous smokers | 62 | 6.1 | 45 | 4.5 | 10 | 3.5 |  |
| Active smokers | 45 | 4.5 | 62 | 6.2 | 17 | 5.9 |  |
| **Overall physical activity** |  |  |  |  |  |  | **0.003** |
| Inactive | 164 | 16.3 | 163 | 16.3 | 71 | 24.9 |  |
| Minimally Active | 505 | 50.2 | 503 | 50.2 | 135 | 47.4 |  |
| Active | 337 | 33.5 | 336 | 33.5 | 79 | 27.7 |  |
| **Total sitting time (hours/day)** |  |  |  |  |  |  | 0.34 |
| 0 to 8 | 280 | 28.0 | 278 | 27.9 | 90 | 31.6 |  |
| 8 to 11 | 320 | 32.0 | 319 | 32.0 | 80 | 28.1 |  |
| More than 11 | 400 | 40.0 | 399 | 40.1 | 115 | 40.4 |  |
| **BMI (kg/m^2)** |  |  |  |  |  |  | 0.87 |
| < 18.5 | 85 | 8.5 | 84 | 8.4 | 26 | 9.0 |  |
| 18.5- 24.9 | 625 | 62.3 | 623 | 62.2 | 175 | 60.6 |  |
| >= 25 | 294 | 29.3 | 294 | 29.4 | 88 | 30.5 |  |
| \*P-value is obtained by comparing the proportions of cohort with available FFQ (n=1007) vs validation subset (n=289) | | | | | | | |
| † Missing values for overall cohort (n=1032): Highest educational attainment (n=13), Monthly household income (n=194), Parity (n=22), Smoking status (n=21), Overall physical activity (n=26), Total sitting time (n=32), BMI (n=28) | | | | | | | |
| ‡ Missing values for cohort with available FFQ (n=1007): Monthly household income (n=174), Parity (n=1), Overall physical activity (n=5), Total sitting time (n=11), BMI (n=6) | | | | | | | |
| § Missing values for validation subset (n=289): Monthly household income (n=31), Parity (n=1), Overall physical activity (n=4), Total sitting time (n=4) | | | | | | | |

**Supplementary Table 3:** Factor congruence across the three FFQ patterns by selected sociodemographic characteristics (n=1007)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Characteristic** | **Stratum 1** | **Stratum 2** | **Fish, poultry/meat and noodles** | **Fast food and sweetened beverages** | **Bread, legumes and dairy** |
| Maternal age | *< 35* | *≥ 35* | 0.85 | 0.84 | 0.78 |
| 85.6% | 14.4% |
| Highest educational attainment | *Below Degree level* | *Degree level and above* | 0.61 | 0.84 | 0.74 |
| 37.6% | 62.4% |
| Parity † | *Nulliparous* | *Parous* | 0.75 | 0.78 | 0.63 |
| 64.8% | 35.2% |
| Ethnicity | *Chinese* | *Non-Chinese* | 0.74 | 0.71 | 0.61 |
| 71.7% | 28.3% |
| Monthly household income † | *Q1, Q2 & Q3* | *Q4 & Q5* | 0.74 | 0.68 | 0.71 |
| 67.4% | 32.6% |
| Overall physical activity † | *Inactive / Minimally active* | *Active* | 0.86 | 0.62 | 0.35 |
| 66.5% | 33.5% |
| \* A congruence coefficient of > 0.50 between the two strata of each FFQ pattern compared is deemed to be acceptable | | | | | |
| † Missing data for parity (n=1), monthly household income (n=174) and overall physical activity (n=5) | | | | | |