**Supplement A:** Food groups contained within the short version food frequency questionnaire and their corresponding dietary pattern analysis food category used to determine diets among Peruvian adults in the CRONICAS cohort study 2010-2013

|  |  |
| --- | --- |
| Food groups within the questionnaire | Food groups used for dietary pattern analysis |
| Whole grains | Whole grains |
| Refined/milled grains | Refined grains |
| Dairy products | Dairy |
| Meat | Red meat |
| Organ meats | Red meat |
| Poultry | Poultry |
| Fish and Seafood | Seafood |
| Eggs  | Eggs |
| Pizza | UPFs |
| Leafy green vegetables | Leafy green vegetables |
| Other raw vegetables | Raw vegetables |
| Other cooked vegetables | Cooked vegetables |
| Legumes, nuts and seeds | Legumes |
| Pickled food | Not used\* |
| Deep fried foods | UPFs |
| Potatoes | Potatoes |
| Salty snacks | UPFs |
| Fruits | Fruit |
| Ice cream and pudding | UPFs |
| Desserts/sweet snacks | UPFs |
| Confectionary, sugars and syrups | UPFs |
| Fruit drinks | UPFs |
| Carbonated beverages† | UPFs |

UPF, ultra-processed foods.

\*Pickled foods not retained in analysis as not eaten by 89.5% of study population.

†Includes sugar-sweetened beverages.

**Supplement B**: Goodness of fit criteria for selection of the optimal latent class analysis model in the identification of dietary patterns among Peruvian adults in the CRONICAS cohort study 2010-2013

**Supplement C**: Percentage distribution of frequency of intake categories of food groups within each class. Used to determine dietary patterns amongst Peruvian adults in the CRONICAS cohort study 2010-2013

**Supplement D:** Distribution of site-specific dietary patterns from four study sites amongst overall dietary patterns of entire cohort of Peruvian adults in the CRONICAS cohort study 2010-2013. Site specific dietary patterns labelled according to most frequently eaten food groups within each pattern.

|  |  |  |
| --- | --- | --- |
|  | Dietary Patterns of Lima (*n=1,064*) |  |
| **Dietary Patterns of the Cohort** | *Processed foods & animal products**No. (%)* | *Fruit & poultry* *No. (%)* | *High diversity**No. (%)* | *Fruit, vegetables & animal products**No. (%)* | *Total**No. (%)* |
| Stage 1 | 6 (2.0) | 1 (0.6) | 0 | 1 (0.4) | 9 (0.8) |
| Stage 2 | 34 (11.2) | 88 (50.6) | 0 | 6 (2.5) | 128 (12.0) |
| Stage 3 | 121 (39.8) | 66 (37.9) | 74 (21.45) | 1 (0.4) | 262 (24.6) |
| Stage 4 | 143 (47.0) | 19 (10.9) | 271 (78.6) | 233 (96.7) | 666 (62.6) |

|  |  |  |
| --- | --- | --- |
|  | Dietary Patterns of Urban Puno (*n=599*) |  |
| **Dietary Patterns of the Cohort** | *Potato & low diversity**No. (%)* | *Potato, fruit, diary & low diversity**No. (%)* | *Potato, fruit, vegetables & low diversity**No. (%)* | *Dairy, processed foods, fruit & high diversity**No. (%)* | *Total**No. (%)* |
| Stage 1 | 24 (48.0) | 5 (3.3) | 0 | 5 (1.9) | 34 (5.7) |
| Stage 2 | 21 (42.0) | 138 (92.0) | 119 (93.0) | 34 (12.6) | 312 (52.1) |
| Stage 3 | 0 | 1 (0.7) | 0 | 7 (2.6) | 8 (1.3) |
| Stage 4 | 5 (10.0) | 6 (4.0) | 9 (7.0) | 225 (83.0) | 245 (40.9) |

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| --- | --- | --- |
|  | Dietary Patterns of Rural Puno (*n=586*) |  |
| **Dietary Patterns of the Cohort** | *Potato, vegetables & animal products**No. (%)* | *Wholegrains, potato, fruit, vegetables & red meat**No. (%)* | *Potato & low diversity**No. (%)* | *Potato & cooked vegetables**No. (%)* | *Total**No. (%)* |
| Stage 1 | 21 (44.7) | 38 (25.3) | 10 (5.2) | 186 (94.9) | 255 (43.5) |
| Stage 2 | 7 (14.9) | 82 (54.7) | 183 (94.8) | 10 (5.1) | 282 (48.1) |
| Stage 3 | 1 (20.3) | 0 | 0 | 0 | 1 (0.2) |
| Stage 4 | 18 (38.3) | 30 (20.0) | 0 | 0 | 48 (8.2) |

|  |  |  |
| --- | --- | --- |
|  | Dietary Patterns of Tumbes (*n=1,031*) |  |
| **Dietary Patterns of the Cohort** | *Seafood, processed foods & high diversity**No. (%)* | *Seafood, processed foods & legumes**No. (%)* | *Seafood, potatoes, fruit & animal products**No. (%)* | *Seafood & processed foods* *No. (%)* | *Total**No. (%)* |
| Stage 1 | 0 | 0 | 0 | 7 (1.54) | 7 (0.7) |
| Stage 2 | 3 (1.1) | 0 | 1 (0.8) | 2 (0.4) | 6 (0.6) |
| Stage 3 | 164 (58.6) | 176 (100.0) | 59 (49.2) | 440 (96.7) | 839 (81.4) |
| Stage 4 | 113 (40.4) | 0 | 60 (50.0) | 6 (1.32) | 179 (17.4) |

**Supplement E:** Baseline prevalence of cardiometabolic outcomes by dietary pattern among Peruvian adults in the CRONICAS cohort study 2010-2013 separated by study site

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | Hypertension | T2DM | High BMI\* |
|  |  | % | p value† | % | p value† | % | p value† |
| LIMA |  | *n*=1,059 |  | *n*=1,037 |  | *n*=1,008 |  |
|  | *Stage 1* | *No observations* |  | *No observations* |  | 87.5% |  |
|  | *Stage 2* | 27.3% |  | 6.4% |  | 81.1% |  |
|  | *Stage 3* | 33.6% | 0.017 | 8.2% | 0.678 | 68.2% | 0.356 |
|  | *Stage 4* | 24.8% |  | 8.7% |  | 78.2% |  |
| URBAN PUNO |  | *n*=591 |  | *n*=525 |  | *n*=543 |  |
|  | *Stage 1* | 24.2% | 0.830 | 3.7% | 0.316 | 66.7% | 0.643 |
|  | *Stage 2* | 25.6% | 9.0% | 75.1% |
|  | *Stage 3* | 37.5% | 25.0% | 75.0% |
|  | *Stage 4* | 23.9% | 10.3% | 77.5% |
| RURAL PUNO |  | *n*=585 |  | *n*=541 |  | *n*=557 |  |
|  | *Stage 1* | 16.9% | 0.011 | 3.3% | 0.805 | 36.8% | 0.001 |
|  | *Stage 2* | 10.7% | 4.7% | 53.7% |
|  | *Stage 3* | 100% (*n*=1) | *No observations* | 100% (*n*=1) |
|  | *Stage 4* | 18.8% | 2.3% | 40.0% |
| TUMBES |  | *n*=1,031 |  | *n*=1,031 |  | *n*=1,004 |  |
|  | *Stage 1* | 57.1% | 0.158 | 28.6% | 0.416 | 42.9% | 0.145 |
|  | *Stage 2* | 16.7% | 16.7% | 83.3% |
|  | *Stage 3* | 31.5% | 11.3% | 75.3% |
|  | *Stage 4* | 25.7% | 9.5% | 79.0% |

T2DM, type 2 diabetes mellitus; BMI, body mass index.

\*High BMI defined as ≥25kg/m2 to incorporate both overweight and obesity.

†Significance test derived from Pearson’s Chi2 test.

**Supplement F:** Association between dietary pattern and hypertension, T2DM and high BMI\* at baseline and follow up among Peruvian adults in the CRONICAS cohort study 2010-2013, separated by site

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| --- | --- | --- |
|  |  | PR (95% CI) |
|  | Crude | Fully Adjusted† |
| LIMA | *Hypertension* (*n*=1,059) |  |  |
|  | *Stage 3* | 1 (Reference) | 1 (Reference) |
|  | *Stage 1* | *No observations* | *No observations* |
|  | *Stage 2* | 0.81 (0.59-1.13) | **0.69 (0.51-0.93)** |
|  | *Stage 4* | **0.74 (0.60-0.91)** | **0.70 (0.58-0.86)** |
|  | *T2DM* (*n*=1,037) |  |  |
|  | *Stage 3* | 1 (Reference) | 1 (Reference) |
|  | *Stage 1* | *No observations* | *No observations* |
|  | *Stage 2* | 0.78 (0.33-1.84) | 0.88 (0.14-5.61) |
|  | *Stage 4* | 1.07 (0.66-1.72) | 4.01 (0.63-25.4) |
|  | *High BMI* (*n*=1,008) |  |  |
|  | *Stage 3* | 1 (Reference) | 1 (Reference)‡ |
|  | *Stage 1* | 1.18 (0.84-1.66) | 1.21 (0.87-1.69) |
|  | *Stage 2* | 1.10 (0.98-1.23) | 1.09 (0.97-1.22) |
|  | *Stage 4* | 1.06 (0.97-1.15) | 1.02 (0.94-1.11) |
| URBAN PUNO | *Hypertension* (*n*=591) |  |  |
|  | *Stage 3* | 1 (Reference) | 1 (Reference) |
|  | *Stage 1* | 0.65 (0.24-1.77) | 0.30 (0.10-0.89) |
|  | *Stage 2* | 0.68 (0.30-1.56) | 0.41 (0.19-0.89) |
|  | *Stage 4* | 0.64 (0.28-1.47) | 0.41 (0.18-0.91) |
|  | *T2DM* (*n*=525) |  |  |
|  | *Stage 3* | 1 (Reference) | *No observations* |
|  | *Stage 1* | 0.15 (0.01-3.29) | *Too few observations* |
|  | *Stage 2* | 0.36 (0.15-0.89) | *Too few observations* |
|  | *Stage 4* | 0.41 (0.17-1.01) | *Too few observations* |
|  | *High BMI* (*n*=543) |  |  |
|  | *Stage 3* | 1 (Reference) | 1 (Reference) ‡ |
|  | *Stage 1* | 0.89 (0.56-1.42) | 0.93 (0.60-1.45) |
|  | *Stage 2* | 1. 0.67-1.50)
 | 1.00 (0.69-1.47) |
|  | *Stage 4* | 1.03 (0.69-1.55) | 1.00 (0.68-1.47) |
| RURAL PUNO | *Hypertension* (*n*=585) |  |  |
|  | *Stage 3* | 1 (Reference) | 1 (Reference) |
|  | *Stage 1* | **0.17 (0.08-0.35)** | **0.08 (0.02-0.27)** |
|  | *Stage 2* | **0.11 (0.05-0.23)** | **0.05 (0.01-0.19)** |
|  | *Stage 4* | **0.19 (0.08-0.44)** | **0.16 (0.05-0.52)** |
|  | *T2DM* (*n*=541) |  |  |
|  | *Stage 3* | *No observations* | *No observations* |
|  | *Stage 1* | *No observations in reference group* | *No observations in reference group* |
|  | *Stage 2* | *No observations in reference group* | *No observations in reference group* |
|  | *Stage 4* | *No observations in reference group* | *No observations in reference group* |
|  | *High BMI* (*n*=557) |  |  |
|  | *Stage 3* | 1 (Reference) | 1 (Reference)‡ |
|  | *Stage 1* | **0.37 (0.14-0.98)** | 0.40 (0.15-1.05) |
|  | *Stage 2* | 0.54 (0.20-1.42) | 0.51 (0.19-1.34) |
|  | *Stage 4* | 0.40 (0.14-1.12) | 0.37 (0.13-1.03) |
| TUMBES | *Hypertension* (*n*=1,031) |  |  |
|  | *Stage 3* | 1 (Reference) | 1 (Reference) |
|  | *Stage 1* | 1.82 (0.99-3.33) | 1.93 (1.15-3.22) |
|  | *Stage 2* | 0.53 (0.06-4.84) | 1.00 (0.35-2.85) |
|  | *Stage 4* | 0.82 (0.62-1.08) | 0.80 (0.63-1.02) |
|  | *T2DM* (*n*=1,031) |  |  |
|  | *Stage 3* | 1 (Reference) | 1 (Reference) |
|  | *Stage 1* | 2.52 (1.09-5.8) | 4.65 (2.40-8.98) |
|  | *Stage 2* | 1.47 (0.32-6.76) | 0.96 (0.10-9.33) |
|  | *Stage 4* | 0.84 (0.50-1.41) | 0.67 (0.41-1.09) |
|  | *High BMI* (*n*=1,004) |  |  |
|  | *Stage 3* | 1 (Reference) | 1 (Reference)‡ |
|  | *Stage 1* | 0.57 (0.27-1.19) | 0.68 (0.35-1.32) |
|  | *Stage 2* | 1.11 (0.73-1.67) | 1.08 (0.72-1.63) |
|  | *Stage 4* | 1.05 (0.96-1.15) | 1.03 (0.94-1.13) |

T2DM, type 2 diabetes mellitus; BMI, body mass index; PR, prevalence ratio; Results with *p* value <0.05 shown in bold.

\*High BMI defined as ≥25kg/m2 to incorporate both overweight and obesity.

† Adjusted for age, sex, education level, currently working, socioeconomic status, smoking, heavy drinking, physical activity, TV watching and high BMI.

‡ Adjusted for age, sex, education level, currently working, socioeconomic status, smoking, heavy drinking, physical activity, and TV watching