**Supplementary Material Text-File: Survey Questionnaire (English)**

**\<Questions related to medical history\>**

1. Have you ever been diagnosed by a doctor with any of the following diseases? If yes, are you currently taking any medication?

| | | | |
|---|---|---|---|
| Stroke | Yes/No | If yes, taking medication | Yes/No |
| Heart disease | Yes/No | If yes, taking medication | Yes/No |
| (Infarction or angina) | | | |
| Hypertension | Yes/No | If yes, taking medication | Yes/No |
| Diabetes | Yes/No | If yes, taking medication | Yes/No |
| Hyperlipidemia | Yes/No | If yes, taking medication | Yes/No |
| Any type of cancer | Yes/No | If yes, taking medication | Yes/No |

Cancer type Gastric cancer__Colon cancer___Lung cancer____Breast cancer____

Thyroid cancer_Others(please specify)_____

2. Has anyone in your family died from or gotten any of the following disease?

Stroke              Yes/No

If yes, please specify Father____Mother____Siblings____Others____

Heart disease           Yes/No

(Infarction or angina)   If yes, please specify Father____Mother____Siblings____Others____

Hypertension          Yes/No

If yes, please specify Father____Mother____Siblings____Others____

Diabetes              Yes/No

If yes, please specify Father____Mother____Siblings____Others____

Any type of cancer      Yes/No

If yes, please specify Father____Mother____Siblings____Others____

Cancer type    Gastric cancer_Colon cancer___Lung cancer____Breast cancer____

Thyroid cancer_Others(please specify)

**&lt;Questions related to smoking and electronic cigarettes&gt;**

3. Have you ever smoked over 5 packs or cigarettes (100 cigarettes as total) in your lifetime?

① No. (☞ Go to Question 4)

② Yes. (☞ Go to Question 3-1)

3-1.    Do you smoke cigarettes now?

    ① I do____A total of ____ years  An average of ____cigarettes a day

    ② I used to but not anymore____    A total of ____years

            Used to smoke ____cigarettes a day on average ____years since I quitted

4.    Have you ever smoked an electronic cigarette (e.g., IQOS, Glo, or Lil)?

① No. (☞ Go to Question 5)

② Yes. (☞ Go to Question 4-1)

4-1.    Do you smoke electronic cigarettes now?

    ① I do____A total of ____ years  An average of ____cigarettes a day

    ② I used to but not anymore____    A total of _ years

            Used to smoke ____cigarettes a day on average ____years since I quitted

5.    Have you ever used a liquid electronic cigarette?

① No.

② Yes. (☞ Go to Question 5-1)

5-1.    Have you used a liquid electronic cigarette in the last month?

① No        ② 1 to 2 days per month        ③ 3 to 9 days per month

④ 10 to 29 days per month                ⑤ Every day


**&lt;Questions related to alcohol drinking&gt;**

6. In the pas one year, how often do you have drinks containing alcohol? (Select one)

    ① (      ) times per week        ② (      ) times per month

    ③  (      ) times per year   ④  I don't drink alcohol.

6-1. How many drinks containing alcohol do you have on a typical day when you are drinking?

&ast;Choose one among the glass, bottle, can, or cc (you can choose more than one for liquor types; choose a similar type for other liquor types that are not indicated)

| Type of liquor | Glass | Bottle | Can | cc |
|---|---|---|---|---|
| Soju | | | | |
| Beer | | | | |
| Hard liquor | | | | |
| Makgeolli (rice wine) | | | | |
| Wine | | | | |

6-2. What is the largest amount of drinks containing alcohol that you have ever had in one day?

&ast;Choose one among the glass, bottle, can, or cc (you can choose more than one for liquor types, choose a similar type for other liquor types that are not indicated)

| Type of liquor | Glass | Bottle | Can | cc |
|---|---|---|---|---|
| Soju | | | | |
| Beer | | | | |
| Hard liquor | | | | |
| Makgeolli (rice wine) | | | | |
| Wine | | | | |

**<Questions related to exercise>**

7-1. How often do you do high intensity exercise (making you short of breath) per week?

(      ) days per week

&ast; Examples of high intensity exercise> Running, aerobics, fast bicycling, construction labor, carrying items using stairs, etc.

7-2. How long do you do high intensity exercise (making you short of breath) per day?

(      ) hours (      ) minutes per day

8-1. How often do you do moderate intensity exercise (making you slightly short of breath) per week?     (      ) days per week

&ast; Exclude exercise you have already written in Question 7

&ast; Examples of moderate intensity exercise> Power walking, doubles tennis games, cycling at normal speed, carrying light items, cleaning, etc.

8-2. How long do you do moderate intensity exercise (making you slightly short of breath) per day?     (      ) hours (      ) minutes per day

9.      How many days did you do weight training such as push-ups, sit-ups, dumbbell exercises, weight lifting, or horizontal bar exercise in the last one week?

(      ) days per week

10. Are you taking following medicine?

Aspirin agents (example: aspirin, astrix etc.)      Yes/No

Anticoagulant agents (example: warfarin, coumardin, clopidogrel, Plavix, etc)      Yes/No

Other medicines diluting blood (please specify)_____

11. What is your marriage status?

Single_____Married_____Separated or divorced_____Separated by death_____

Others (please specify) _____

12. What is your education attainment?

Graduated from elementary school_____   Graduated from middle school_____

Graduated from high school_____          Graduated from college/university or higher_____

13. (Women only) Have you gone through menopause?    Yes/No

**Table S1** Incidences and risks of coronary artery atherosclerosis progression by quartiles of metabolic parameters variability among participants without any medication at baseline

| Parameters | Incidence rate (per 1,000) | Crude Hazard ratio (95% CI) | P for trend | Model 1 Hazard ratio (95% CI) | P for trend | Model 2 Hazard ratio (95% CI) | P for trend | Model 3 Hazard ratio (95% CI) | P for trend |
|---|---|---|---|---|---|---|---|---|---|
| BMI | | | | | | | | | |
| Q1 | 70.83 | ref | 0.88 | ref | 0.96 | ref | 0.87 | ref | 0.86 |
| Q2 | 71.63 | 0.91 (0.49, 1.69) | | 0.78 (0.32, 1.91) | | 0.91 (0.48, 1.73) | | 0.91 (0.48, 1.71) | |
| Q3 | 78.37 | 0.94 (0.50, 1.74) | | 0.89 (0.38, 2.12) | | 0.98 (0.52, 1.86) | | 0.90 (0.48, 1.67) | |
| Q4 | 70.03 | 0.79 (0.43, 1.47) | | 0.86 (0.36, 2.06) | | 0.80 (0.42, 1.52) | | 0.77 (0.41, 1.44) | |
| Waist circumference | | | | | | | | | |
| Q1 | 63.88 | ref | 0.02 | ref | 0.085 | ref | 0.01 | ref | 0.036 |
| Q2 | 60.61 | 0.62 (0.32, 1.20) | | 0.36 (0.14, 0.89) | | 0.56 (0.29, 1.11) | | 0.61 (0.31, 1.20) | |
| Q3 | 105.69 | 1.37 (0.83, 2.25) | | 1.07 (0.54, 2.14) | | 1.35 (0.80, 2.27) | | 1.35 (0.81, 2.26) | |
| Q4 | 50.39 | 0.63 (0.32, 1.24) | | 0.69 (0.28, 1.70) | | 0.56 (0.28, 1.12) | | 0.62 (0.32, 1.23) | |
| Systolic BP | | | | | | | | | |
| Q1 | 83.03 | ref | 0.11 | ref | 0.22 | ref | 0.07 | ref | 0.06 |
| Q2 | 53.25 | 0.46 (0.25, 0.86) | | 0.52 (0.23, 1.19) | | 0.43 (0.22, 0.81) | | 0.42 (0.22, 0.79) | |
| Q3 | 70.55 | 0.67 (0.37, 1.20) | | 0.55 (0.24, 1.26) | | 0.61 (0.33, 1.12) | | 0.63 (0.35, 1.14) | |
| Q4 | 86.42 | 0.66 (0.37, 1.16) | | 0.43 (0.18, 0.98) | | 0.69 (0.38, 1.24) | | 0.63 (0.35, 1.14) | |
| Diastolic BP | | | | | | | | | |
| Q1 | 60.87 | ref | 0.45 | ref | 0.37 | ref | 0.31 | ref | 0.31 |
| Q2 | 56.82 | 0.75 (0.38, 1.46) | | 0.77 (0.32, 1.82) | | 0.70 (0.35, 1.40) | | 0.68 (0.34, 1.33) | |
| Q3 | 80.36 | 1.04 (0.59, 1.86) | | 0.54 (0.25, 1.19) | | 1.04 (0.58, 1.87) | | 0.98 (0.54, 1.76) | |
| Q4 | 90.63 | 1.25 (0.71, 2.20) | | 1.08 (0.50, 2.33) | | 1.32 (0.74, 2.38) | | 1.26 (0.71, 2.27) | |
| Plasma glucose | | | | | | | | | |
| Q1 | 49.22 | ref | 0.15 | ref | 0.48 | ref | 0.14 | ref | 0.19 |
| Q2 | 70.63 | 1.20 (0.63, 2.27) | | 0.64 (0.24, 1.69) | | 1.11 (0.57, 2.15) | | 1.12 (0.58, 2.17) | |
| Q3 | 98.25 | 1.90 (1.06, 3.41) | | 1.38 (0.61, 3.15) | | 1.94 (1.05, 3.56) | | 1.81 (0.99, 3.28) | |
| Q4 | 80.00 | 1.48 (0.82, 2.68) | | 1.04 (0.47, 2.31) | | 1.40 (0.74, 2.66) | | 1.49 (0.82, 2.71) | |
| Total cholesterol | | | | | | | | | |
| Q1 | 70.55 | ref | 0.53 | ref | 0.74 | ref | 0.75 | ref | 0.62 |
| Q2 | 67.07 | 0.81 (0.45, 1.46) | | 0.68 (0.31, 1.49) | | 0.81 (0.45, 1.48) | | 0.74 (0.40, 1.35) | |
| Q3 | 84.46 | 1.26 (0.71, 2.21) | | 0.73 (0.31, 1.72) | | 1.12 (0.62, 2.03) | | 1.08 (0.59, 1.97) | |
| Q4 | 69.84 | 1.00 (0.56, 1.80) | | 0.93 (0.41, 2.11) | | 0.94 (0.49, 1.79) | | 0.92 (0.50, 1.71) | |
| Triglyceride | | | | | | | | | |
| Q1 | 37.50 | ref | 0.02 | ref | 0.04 | ref | 0.08 | ref | 0.03 |
| Q2 | 70.97 | 1.80 (0.89, 3.65) | | 1.56 (0.59, 4.15) | | 1.87 (0.91, 3.83) | | 1.76 (0.86, 3.60) | |
| Q3 | 77.40 | 1.97 (0.99, 3.96) | | 1.46 (0.56, 3.80) | | 2.08 (1.00, 4.31) | | 1.93 (0.95, 3.89) | |
| Q4 | 105.77 | 2.78 (1.43, 5.39) | | 3.18 (1.29, 7.86) | | 2.53 (1.26, 5.12) | | 2.70 (1.38, 5.28) | |
| HDL-cholesterol | | | | | | | | | |
| Q1 | 90.65 | ref | 0.005 | ref | 0.46 | ref | 0.01 | ref | 0.007 |
| Q2 | 93.62 | 1.12 (0.65, 1.94) | | 0.97 (0.42, 2.21) | | 1.15 (0.67, 2.00) | | 1.14 (0.66, 1.98) | |
| Q3 | 68.88 | 0.56 (0.33, 0.95) | | 0.58 (0.27, 1.23) | | 0.59 (0.34, 1.01) | | 0.56 (0.33, 0.96) | |
| Q4 | 38.60 | 0.38 (0.19, 0.76) | | 0.74 (0.31, 1.74) | | 0.39 (0.19, 0.81) | | 0.40 (0.20, 0.79) | |
| LDL-cholesterol | | | | | | | | | |
| Q1 | 50.00 | ref | 0.004 | ref | 0.05 | ref | 0.007 | ref | 0.007 |
| Q2 | 52.31 | 1.05 (0.53, 2.08) | | 1.17 (0.44, 3.12) | | 1.11 (0.55, 2.23) | | 0.98 (0.49, 1.97) | |
| Q3 | 109.68 | 2.50 (1.38, 4.54) | | 2.70 (1.21, 6.03) | | 2.52 (1.37, 4.63) | | 2.38 (1.28, 4.40) | |
| Q4 | 80.65 | 1.61 (0.86, 3.02) | | 2.22 (0.95, 5.18) | | 1.63 (0.82, 3.22) | | 1.56 (0.81, 2.98) | |

Model 1: adjusted by age, sex, smoking status, alcohol consumption, exercise, education. Model 2: further adjusted by baseline BMI, WC, systolic/diastolic BPs, plasma glucose, total cholesterol, triglyceride, HDL-cholesterol, and LDL-cholesterol. Model 3: further adjusted by history of metabolic diseases (HT, DM, dyslipidemia, ischemic heart disease or stroke).