# *Supplementary Material*

## 1 Supplementary Figures and Tables

### 1.1 Supplementary Tables

**Supplementary Table 1. Association between dietary vitamin C (<1000 mg/day) intake and gout**

| | | Vitamin C intake(mg) | | | | |
|---|---|---|---|---|---|---|
| | Variable | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 | *P* for trend |
| | N | 3146 | 3146 | 3146 | 3146 | 12584 |
| | Gout,% | 167 (5.3) | 160 (5.1) | 156 (5) | 143 (4.5) | 626 (5) |
| Model1 | OR (95%CI) | 1(Ref) | 0.9 (0.72~1.13) | 0.81 (0.64~1.03) | 0.72 (0.57~0.92) | - |
| | *P* value | | 0.375 | 0.082 | 0.008* | 0.005* |
| Model2 | OR (95%CI) | 1(Ref) | 0.9 (0.71~1.13) | 0.82 (0.64~1.03) | 0.74 (0.58~0.95) | - |
| | *P* value | | 0.364 | 0.091 | 0.016* | 0.011* |
| Model3 | OR (95%CI) | 1(Ref) | 0.9 (0.71~1.13) | 0.81 (0.64~1.03) | 0.75 (0.59~0.95) | - |

| | | | | |
|---|---|---|---|---|
| *P* value | 0.358 | 0.09 | 0.02* | 0.014* |

OR, odds ratio; CI, confidence interval; Ref: reference.

Model 1 was adjusted for sociodemographic variables (age, sex, marital status, race/ethnicity, education level, family income).

Model 2 was adjusted for sociodemographic (age, sex, marital status, race/ethnicity, education level, family income), hypertension, diabetes, coronary heart disease.

Model 3 was adjusted for sociodemographic (age, sex, marital status, race/ethnicity, education level, family income), hypertension, diabetes, coronary heart disease, smoking status, physical activity, alcohol, dietary supplements taken. $P<0.05$, *

**Supplementary Table 2. Association between dietary vitamin C intake (from the second survey) and gout**

| | | | Crude | | Model1 | | Model 2 | | Model3 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Variables | N | Gout, n,% | OR (95%CI) | *P* value | OR (95%CI) | *P* value | OR (95%CI) | *P* value | OR (95%CI) | *P* value |
| Vitamin C (per 100 mg/d) | 11030 | 566 (5.1) | 0.86(0.77~0.96) | 0.01 | 0.80 (0.71~0.90) | <0.001* | 0.81(0.72~0.91) | <0.001* | 0.81(0.72~0.91) | <0.001* |
| Quartiles | | | | | | | | | | |
| Quartile 1 | 2756 | 151 (5.5) | 1(Ref) | | 1(Ref) | | 1(Ref) | | 1(Ref) | |
| Quartile 2 | 2751 | 161 (5.9) | 1.07 (0.85~1.35) | 0.549 | 0.95 (0.74~1.2) | 0.645 | 0.95 (0.74~1.21) | 0.671 | 0.95 (0.74~1.21) | 0.65 |
| Quartile 3 | 2763 | 137 (5) | 0.9 (0.71~1.14) | 0.385 | 0.73 (0.57~0.94) | 0.015* | 0.73 (0.57~0.94) | 0.014* | 0.73 (0.57~0.94) | 0.014* |
| Quartile 4 | 2760 | 117 (4.2) | 0.76 (0.6~0.98) | 0.033* | 0.62 (0.48~0.8) | <0.001* | 0.65 (0.5~0.84) | 0.001* | 0.64 (0.49~0.84) | 0.001* |
| *P* for trend | 11030 | 566 (5.1) | - | 0.014* | - | <0.001* | - | <0.001* | - | <0.001* |

OR, odds ratio; CI, confidence interval; Ref: reference.

Model 1 was adjusted for sociodemographic variables (age, sex, marital status, race/ethnicity, education level, family income).

Model 2 was adjusted for sociodemographic (age, sex, marital status, race/ethnicity, education level, family income), hypertension, diabetes, coronary heart disease.

Model 3 was adjusted for sociodemographic (age, sex, marital status, race/ethnicity, education level, family income), hypertension, diabetes, coronary heart disease, smoking status, physical activity, alcohol, dietary supplements taken.

*P*<0.05, *

**Supplementary Table 3. Association between dietary supplemental vitamin C and gout**

| Variable | N | Gout, % | Crude | | Model1 | | Model2 | | Model3 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | OR (95%CI) | *P* value | OR (95%CI) | *P* value | OR (95%CI) | *P* value | OR (95%CI) | *P* value |
| Vitamin C (per100 mg/d) | 3177 | 192 (6) | 0.998 (0.967~1.03) | 0.9126 | 0.989 (0.955~1.025) | 0.552 | 0.998 (0.964~1.032) | 0.8919 | 0.997 (0.964~1.031) | 0.8602 |
| Quartiles | | | | | | | | | | |
| Quartile 1 | 343 | 15 (4.4) | 1(Ref) | | 1(Ref) | | 1(Ref) | | 1(Ref) | |
| Quartile 2 | 1141 | 77 (6.7) | 1.58 (0.9~2.79) | 0.112 | 1.00 (0.56~1.82) | 0.963 | 0.99 (0.54~1.79) | 0.965 | 1.00 (0.55~1.84) | 0.981 |
| Quartile 3 | 880 | 50 (5.7) | 1.32 (0.73~2.38) | 0.361 | 0.9 (0.49~1.65) | 0.73 | 0.92 (0.49~1.71) | 0.791 | 0.94 (0.5~1.76) | 0.845 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Quartile 4 | 813 | 50 (6.2) | 1.43 (0.79~2.59) | 0.233 | 0.9 (0.49~1.65) | 0.728 | 0.96 (0.52~1.79) | 0.896 | 0.98 (0.53~1.83) | 0.953 |
| *P* for trend | 3177 | 192 (6) | 1.03 (0.88~1.19) | 0.743 | 0.95 (0.81~1.11) | 0.501 | 0.98 (0.83~1.16) | 0.822 | 0.99 (0.84~1.16) | 0.859 |

OR, odds ratio; CI, confidence interval; Ref: reference.

Model 1 was adjusted for sociodemographic variables (age, sex, marital status, race/ethnicity, education level, family income).

Model 2 was adjusted for sociodemographic (age, sex, marital status, race/ethnicity, education level, and family income), hypertension, diabetes, coronary heart disease.

Model 3 was adjusted for sociodemographic (age, sex, marital status, race/ethnicity, education level, family income), hypertension, diabetes, coronary heart disease, smoking status, physical activity, alcohol, dietary supplements taken. $P<0.05$, *

**Supplementary Table 4. Association between Vitamin C intake and hyperuricemia**

| | | | Crude | | Model 1 | | Model 2 | | Model 3 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Variables | N | Hyperuricemia,% | OR (95%CI) | *P* value | OR (95%CI) | *P* value | OR (95%CI) | *P* value | OR (95%CI) | *P* value |
| Vitamin C (per 100mg/d) | 12019 | 4097 (34.1) | 0.99 (0.95~1.03) | 0.725 | 0.94 (0.9~0.98) | 0.007* | 0.94 (0.9~0.98) | 0.005* | 0.94 (0.9~0.98) | 0.005* |
| Quartiles | | | | | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Quartile 1 | 3018 | 1126 (37.3) | 1(Ref) | | 1(Ref) | | 1(Ref) | | 1(Ref) | |
| Quartile 2 | 3029 | 977 (32.3) | 0.8 (0.72~0.89) | <0.001* | 0.78 (0.7~0.88) | <0.001* | 0.78 (0.7~0.88) | <0.001* | 0.77 (0.69~0.86) | <0.001* |
| Quartile 3 | 2985 | 1004 (33.6) | 0.85 (0.77~0.95) | 0.003* | 0.83 (0.74~0.93) | 0.001* | 0.83 (0.74~0.93) | 0.002* | 0.81 (0.72~0.91) | <0.001* |
| Quartile 4 | 2987 | 990 (33.1) | 0.83 (0.75~0.93) | 0.001* | 0.74 (0.66~0.83) | <0.001* | 0.74 (0.66~0.83) | <0.001* | 0.72 (0.64~0.81) | <0.001* |
| *P* for trend | 12019 | 4097 (34.1) | - | 0.004* | - | <0.001* | - | <0.001* | - | <0.001* |

OR, odds ratio; CI, confidence interval; Ref: reference.

Model 1 was adjusted for sociodemographic variables (age, sex, marital status, race/ethnicity, education level, family income).

Model 2 was adjusted for sociodemographic (age, sex, marital status, race/ethnicity, education level, and family income), hypertension, diabetes, coronary heart disease.

Model 3 was adjusted for sociodemographic (age, sex, marital status, race/ethnicity, education level, and family income), hypertension, diabetes, coronary heart disease, smoking status, physical activity, alcohol, dietary supplements taken.

**Supplementary Table 5. Likelihood ratios for the regression**

| | Model 1 | Model2 | Model 3 |
|---|---|---|---|
| Number of Observations | 12589 | 12589 | 12589 |

| | | | |
|---|---|---|---|
| AIC | 4459.4 | 4308 | 4302.3 |
| BIC | 4548.7 | 4419.6 | 4458.6 |
| Log.Lik. | -2217.7 | -2139 | -2130.2 |
| RMSE | 0.21 | 0.21 | 0.21 |

AIC, Akaike's Information Criterion; BIC, Bayesian Information Criterion (*BIC*) Log.lik, Log Likelihood. RMSE, Root mean square error.;

Model 1 was adjusted for sociodemographic variables (age, sex, marital status, race/ethnicity, education level, family income).

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Model 3 was adjusted for sociodemographic (age, sex, marital status, race/ethnicity, education level, family income), hypertension, diabetes, coronary heart disease, smoking status, physical activity, alcohol, dietary supplements taken.