

Association of Triglyceride-Glucose Index and Lung Health

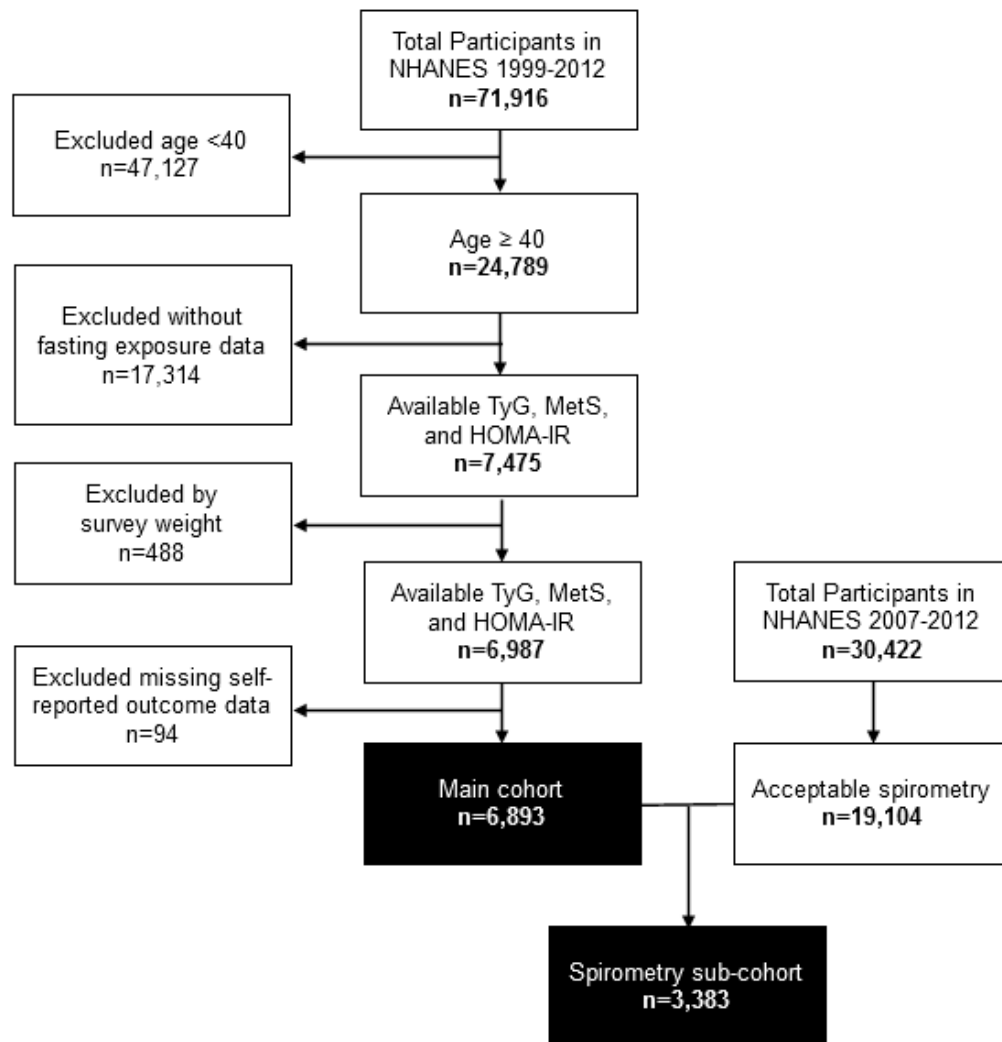
A Population-Based Study

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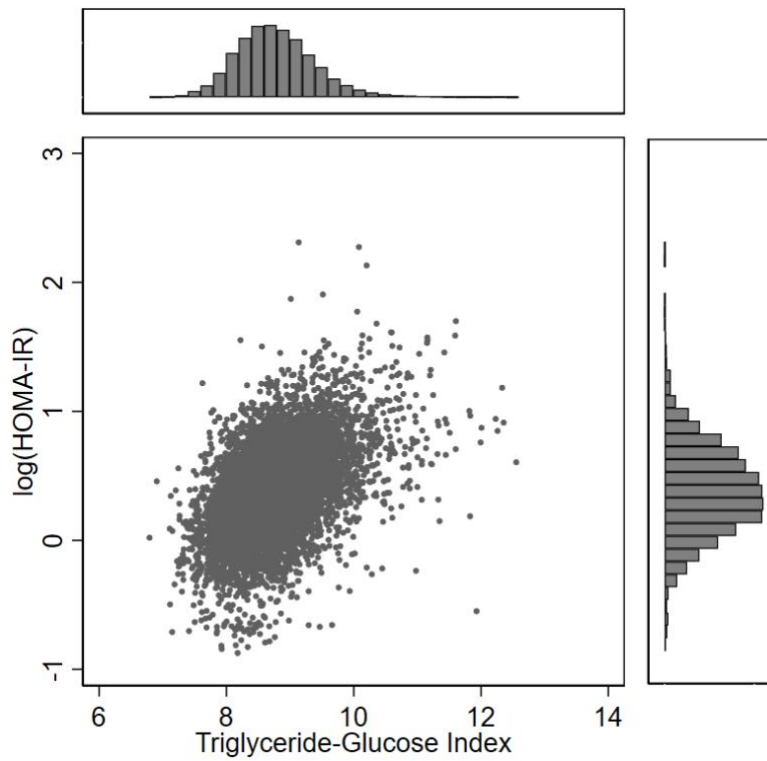
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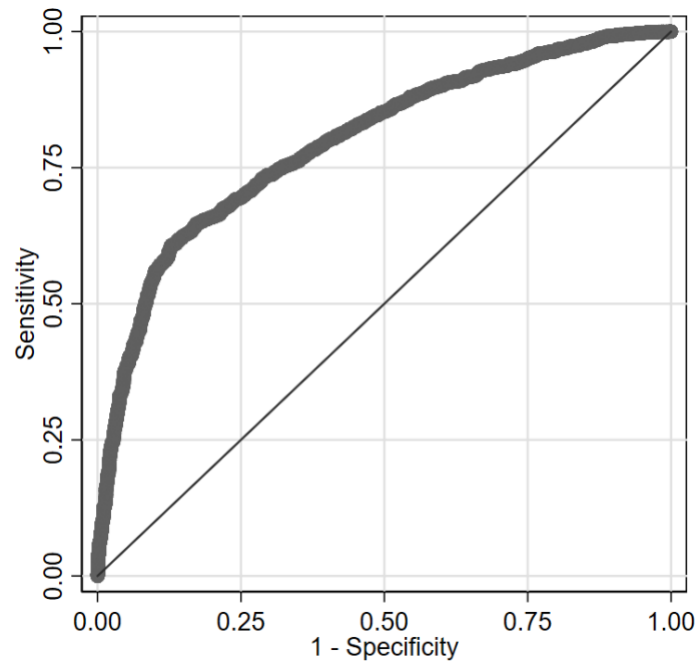
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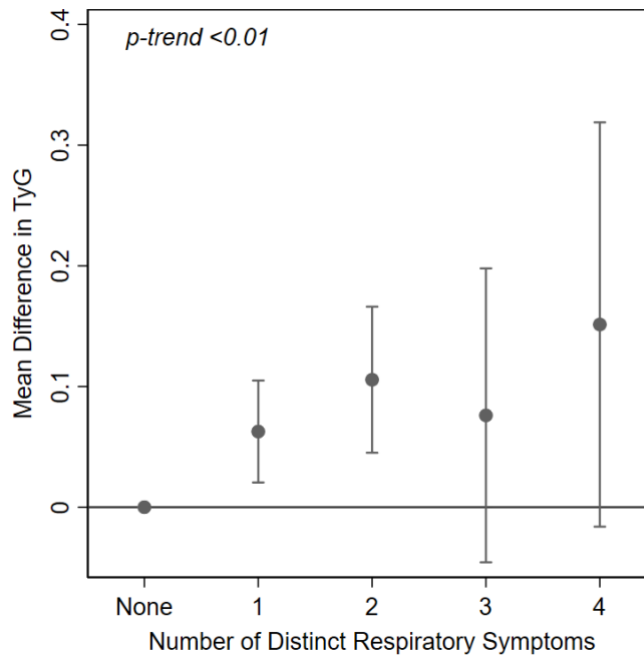
e-Figure 1. Flowchart of cohort derivation. TyG: triglyceride-glucose index; HOMA-IR: homeostatic model assessment of insulin resistance



e-Figure 2. Scatterplot of triglyceride-glucose index against log-transformed homeostatic model assessment of insulin resistance (HOMA-IR). Marginal histograms for each analyte are also displayed. The population-weighted Spearman's rho was 0.51.



e-Figure 3. Population-weighted receiver operating characteristic curve of triglyceride-glucose index for detection of metabolic syndrome. Area under the curve (95% confidence interval) is 0.80 (0.78, 0.81).



e-Figure 4. Association of triglyceride-glucose index (TyG) with number of distinct respiratory symptoms. Shown are mean difference in TyG compared to the referent group of no symptoms, adjusted for age, gender, race-ethnicity, body mass index, poverty-income ratio, cardiovascular disease, smoking status, smoking years, and fasting time. The p-value indicates a test for linear trend with increasing number of symptoms derived by treating symptom count as a continuous variable.

e-Table 1. Association of triglyceride-glucose index (TyG) with study outcomes, stratified by gender*

| Symptom, aOR (95% CI) | Gender | | p-value+ |
|--|----------------------|----------------------|----------|
| | Male | Female | |
| Cough | 1.17 (0.93, 1.47) | 1.38 (1.09, 1.75) | 0.24 |
| Phlegm production | 1.10 (0.89, 1.37) | 1.32 (1.05, 1.66) | 0.22 |
| Wheeze | 1.21 (1.03, 1.43) | 1.15 (0.92, 1.43) | 0.69 |
| Exertional dyspnea | 1.18 (1.02, 1.37) | 1.24 (1.04, 1.48) | 0.64 |
| Condition, aOR (95% CI) | | | |
| Asthma | 0.91 (0.71, 1.16) | 1.26 (1.01, 1.57) | 0.06 |
| Chronic bronchitis | 1.25 (0.93, 1.68) | 1.19 (0.95, 1.48) | 0.78 |
| Emphysema | 0.89 (0.64, 1.24) | 1.16 (0.56, 2.38) | 0.54 |
| Spirometry, aMD (95% CI) | | | |
| Percent-predicted FEV1 | -2.08 (-3.84, -0.32) | -0.92 (-2.73, 0.89) | 0.35 |
| Percent-predicted FVC | -2.44 (-4.01, -0.88) | -1.98 (-3.59, -0.36) | 0.66 |
| FEV1/FVC | 0.09 (-0.66, 0.84) | 0.94 (0.32, 1.56) | 0.06 |
| Spirometry Pattern, aRRR (95% CI) | | | |
| Obstructive | 0.91 (0.69, 1.2) | 0.87 (0.68, 1.12) | 0.97 |
| Restrictive | 1.48 (0.97, 2.27) | 1.45 (0.98, 2.14) | |

* adjusted for age, race-ethnicity, body mass index, poverty-income ratio, cardiovascular disease, smoking status, smoking years, and fasting time; + p-value for interaction of TyG by gender; aOR: adjusted odds ratio; aMD: adjusted mean difference; aRRR: adjusted relative risk ratio; CI: confidence interval; FEV1: forced exhaled volume in 1 second; FVC: forced vital capacity

e-Table 2. Association of triglyceride-glucose index (TyG) with study outcomes, stratified by race-ethnicity*

| Symptom, aOR (95% CI) | Race-Ethnicity | | | p-value+ |
|--|----------------------|----------------------|---------------------|----------|
| | Hispanic | White | Black | |
| Cough | 0.72 (0.5, 1.03) | 1.36 (1.09, 1.71) | 1.56 (1.17, 2.09) | <0.01 |
| Phlegm production | 0.84 (0.59, 1.2) | 1.27 (1.01, 1.59) | 1.02 (0.76, 1.36) | 0.13 |
| Wheeze | 1.05 (0.72, 1.53) | 1.22 (1.03, 1.44) | 1.23 (0.97, 1.56) | 0.75 |
| Exertional dyspnea | 1.05 (0.87, 1.27) | 1.28 (1.09, 1.52) | 1.04 (0.87, 1.24) | 0.18 |
| Condition, aOR (95% CI) | | | | |
| Asthma | 0.95 (0.64, 1.42) | 1.19 (0.97, 1.45) | 0.9 (0.69, 1.18) | 0.25 |
| Chronic bronchitis | 0.92 (0.58, 1.45) | 1.34 (1.11, 1.62) | 0.97 (0.67, 1.41) | 0.15 |
| Emphysema | 0.58 (0.27, 1.28) | 1.08 (0.71, 1.63) | 0.71 (0.23, 2.16) | 0.39 |
| Spirometry, aMD (95% CI) | | | | |
| Percent-predicted FEV1 | -2.11 (-4.3, 0.09) | -1.66 (-3.3, -0.02) | 0.01 (-2.17, 2.18) | 0.33 |
| Percent-predicted FVC | -2.99 (-4.89, -1.09) | -2.19 (-3.81, -0.58) | -0.51 (-2.15, 1.14) | 0.13 |
| FEV1/FVC | 0.65 (0.08, 1.22) | 0.33 (-0.27, 0.93) | 0.57 (-0.56, 1.7) | 0.66 |
| Spirometry Pattern, aRRR (95% CI) | | | | |
| Obstructive | 0.91 (0.59, 1.42) | 0.91 (0.72, 1.14) | 0.7 (0.49, 1) | 0.04 |
| Restrictive | 1.29 (0.86, 1.94) | 1.5 (1.06, 2.11) | 0.72 (0.46, 1.12) | |

* adjusted for age, gender, body mass index, poverty-income ratio, cardiovascular disease, smoking status, smoking years, and fasting time; + p-value for interaction of TyG by race-ethnicity; aOR: adjusted odds ratio; aMD: adjusted mean difference; aRRR: adjusted relative risk ratio; CI: confidence interval; FEV1: forced exhaled volume in 1 second; FVC: forced vital capacity

e-Table 3. Association of triglyceride-glucose index (TyG), the homeostatic model assessment of insulin resistance (HOMA-IR), and the presence of metabolic syndrome with study outcomes*

| Symptom, aOR (95% CI) | Metabolic parameter | | |
|--|-----------------------------|-----------------------------|-----------------------------|
| | TyG+ | log(HOMA-IR) | Metabolic syndrome |
| Cough | 1.28 (1.06, 1.54) | 1.40 (1.01, 1.94) | 1.34 (1.03, 1.76) |
| Phlegm production | 1.20 (1.01, 1.43) | 1.20 (0.81, 1.79) | 1.19 (0.95, 1.49) |
| Wheeze | 1.18 (1.03, 1.35) | 1.02 (0.77, 1.35) | 1.25 (1.04, 1.51) |
| Exertional dyspnea | 1.21 (1.07, 1.38) | 1.36 (1.08, 1.70) | 1.31 (1.11, 1.55) |
| Condition, aOR (95% CI) | | | |
| Asthma | 1.09 (0.93, 1.29) | 1.06 (0.78, 1.43) | 1.19 (0.95, 1.48) |
| Chronic bronchitis | 1.21 (1.02, 1.43) | 1.28 (0.84, 1.95) | 1.17 (0.89, 1.55) |
| Emphysema | 1.01 (0.69, 1.49) | 1.08 (0.60, 1.95) | 1.12 (0.75, 1.68) |
| Spirometry, aMD (95% CI) | | | |
| Percent-predicted FEV1 | -1.53 (-2.80, -0.26) | -4.42 (-7.51, -1.32) | -3.18 (-4.92, -1.45) |
| Percent-predicted FVC | -2.22 (-3.41, -1.03) | -5.88 (-8.52, -3.23) | -3.00 (-4.23, -1.77) |
| FEV1/FVC | 0.50 (-0.04, 1.03) | 1.15 (-0.15, 2.44) | -0.24 (-1.18, 0.70) |
| Spirometry Pattern, aRRR (95% CI) | | | |
| Obstructive | 0.88 (0.72, 1.06) | 0.91 (0.56, 1.47) | 1.09 (0.79, 1.50) |
| Restrictive | 1.45 (1.11, 1.90) | 1.79 (0.90, 3.59) | 1.66 (0.99, 2.77) |

* adjusted for age, gender, race-ethnicity, body mass index, poverty-income ratio, cardiovascular disease, smoking status, smoking years, and fasting time; + identical to Figure 1 and included to aid comparison; aOR: adjusted odds ratio; aMD: adjusted mean difference; aRRR: adjusted relative risk ratio; CI: confidence interval; FEV1: forced exhaled volume in 1 second; FVC: forced vital capacity