

Supplementary

Cohorts under study

The TLGS study began in 1998 with the purpose of identifying the risk factors for non-communicable diseases particularly cardio-metabolic diseases in Tehran's urban population. During the first phase of the study 15005 individuals aged above 3 years (8395 women) participated in the study (1). In the second phase that was conducted in 2001, 3550 new persons were added to the population under study (2).

The ICS study began in 2001 with the goal of determining the incidence of CVD and identifying its risk factors in Isfahan and Arak's population aged above 35 years; 6504 persons (3336 women) from urban and rural populations (73% urban) were included in the study (3).

The GCS study examined the risk factors for cancers and other chronic diseases in Golestan province since 2004, wherein 50045 individuals (28804 women) ranging from 40-75 years (24% urban) were included. In the second phase of the study that was launched in 2010, the assessments performed in the first phase were repeated for all the participants. Additionally, 11418 of the participants were randomly selected for laboratory measurements in this phase (4, 5).

The ShECS study was started in 2009 to determine the prevalence and incidence of ophthalmic disorders among Shahroud urban population of men and women aged 40–64 years. Overall, 5190 individuals (3039 women) were included in the study (6).

In all the aforementioned studies the participants were followed-up by phone and in the case of an event their files would be examined more carefully and the definite diagnosis would be made along with coding.

Although the GCS and ShECS studies were designed with objectives other than CVD, they have examined and registered many data relevant to CVD risk factors. Causes of mortality have also been registered.

Supplementary Table 1: Data availability in cohorts and prevalence of missing data across studies* in the pooling project

| | TLGS | ICS | GCS1 | GCS2 | ShECS | % of missing data across studies (range) [†] |
|--|------|-----|------|------|----------------|---|
| Self reported variables | | | | | | |
| Age | √ | √ | √ | √ | √ | 0 |
| Education | √ | √ | √ | √ | √ | 0 – 1.5 |
| Smoking status | √ | √ | √ | √ | √ | 0 – 1.8 |
| History of diabetes | √ | √ | √ | √ | √ | 0 – 0.9 |
| History of hypertension | √ | √ | √ | √ | √ | 0 – 0.5 |
| History of glucose lowering medication | √ | √ | √ | √ | √ | 0 – 0.2 |
| History of lipid lowering medication | √ | √ | √ | √ | √ | 0 – 6.8 |
| History of antihypertensive medication | √ | √ | √ | √ | √ | 0 – 0.5 |
| Family history of CVD | √ | √ | - | - | √ | 0 - 2.7 |
| Family history of Diabetes | √ | √ | - | - | - | 0 – 3.3 |
| Examined variables | | | | | | |
| SBP | √ | √ | √ | √ | √ | 0 – 0.5 |
| DBP | √ | √ | √ | √ | √ | 0 – 0.5 |
| Height | √ | √ | √ | √ | √ | 0 – 1.4 |
| Weight | √ | √ | √ | √ | √ | 0 – 1.4 |
| Waist circumference | √ | √ | √ | √ | - | 0 – 1.6 |
| Hip circumference | √ | √ | √ | √ | - | 0 – 1.6 |
| FBS | √ | √ | - | √ | - [‡] | 0 – 2.0 |
| Postprandial Plasma Glucose | √ | √ | - | √ | - | 0 – 0.02 |
| Serum total cholesterol | √ | √ | - | √ | - | 0 – 2.0 |
| Serum triglyceride | √ | √ | - | √ | - | 0 – 2.0 |
| Serum HDL | √ | √ | - | √ | - | 0 – 2.1 |

*TLGS: Tehran Lipid and Glucose Study, ICS: Isfahan Cohort Study, GCS1: Golestan Cohort Study- Phase1, GCS2: Golestan Cohort Study- Phase2, ShECS: Shahroud Eye Cohort Study

[†] Among cohorts with available data

[‡] BS is available instead

Supplementary Table 2: General characteristics of individuals included in the pooling projects at the baseline of cohorts*, by sex

| | | TLGS [†] | ICS | GCS1 | GCS2 | ShECS |
|--|-------|-------------------|--------------|--------------|-------------|-------------|
| Continuous variables , mean (sd) | | | | | | |
| Age, year | men | 54.6 (10.5) | 54.1 (10.7) | 52.1 (9.2) | 56.1 (8.2) | 51.3 (6.2) |
| | women | 52.8 (9.2) | 53.3 (10.1) | 50.9 (8.3) | 54.6 (7.5) | 50.3 (6.2) |
| Body Mass Index, cm | men | 26.3 (4.0) | 25.6 (3.9) | 25.1 (4.6) | 25.5 (4.6) | 26.5 (4.2) |
| | women | 29.2 (4.7) | 27.9 (4.6) | 27.7 (5.7) | 28.3 (5.5) | 29.7 (5.0) |
| Waist circumference, cm | men | 91.7 (10.8) | 93.1 (11.5) | 93.9 (13.2) | 92.8 (13.7) | - |
| | women | 93.5 (11.5) | 97.1 (12.6) | 96.0 (14.0) | 95.3 (13.9) | - |
| Hip circumference, cm | men | 96.6 (6.9) | 99.7 (9.0) | 93.4 (7.8) | 98.1 (7.7) | - |
| | women | 106.0 (9.6) | 103.7 (10.8) | 100.2 (10.2) | 99.7 (9.7) | - |
| Serum cholesterol, mmol/l | men | 5.4 (1.1) | 5.4 (1.4) | - | 5.0 (1.0) | - |
| | women | 5.9 (1.2) | 5.8 (1.4) | - | 5.5 (1.1) | - |
| Ln Serum triglyceride, mmol/l [‡] | men | 2.2 (0.6) | 2.3 (0.5) | - | 1.9 (0.5) | - |
| | women | 2.2 (0.5) | 2.3 (0.5) | - | 1.9 (0.5) | - |
| Serum HDL, mmol/l | men | 1.0 (0.3) | 1.2 (0.3) | - | 1.5 (0.4) | - |
| | women | 1.2 (0.3) | 1.3 (0.3) | - | 1.6 (0.4) | - |
| Categorical variables, n (%) | | | | | | |
| Education, Diploma and higher | men | 1125 (43.9) | 569 (23.0) | 3173 (16.3) | 936 (19.4) | 1008 (54.3) |
| | women | 677 (21.3) | 262 (10.1) | 681 (2.6) | 131 (2.4) | 898 (33.0) |
| Current Smoking | men | 735 (28.7) | 734 (29.6) | 4770 (24.5) | 829 (17.2) | 497 (26.6) |
| | women | 130 (4.1) | 59 (2.3) | 275 (1.0) | 40 (0.7) | 11 (0.4) |
| Diabetes [§] | men | 319 (12.4) | 205 (8.3) | - | 530 (11.0) | 176 (9.5) |
| | women | 465 (14.7) | 276 (10.6) | - | 720 (13.3) | 352 (12.9) |
| Self reported diabetes [¥] | men | 311 (12.1) | 258 (10.4) | 897 (4.6) | 373 (7.7) | 157 (8.5) |
| | women | 454 (14.3) | 363 (13.9) | 2005 (7.6) | 626 (11.6) | 351 (12.9) |
| Hypertension [¶] | men | 721 (28.1) | 694 (28.0) | 7047 (36.1) | 1707 (35.4) | 710 (38.2) |
| | women | 1021 (32.2) | 916 (35.2) | 11776 (44.6) | 2151 (39.8) | 1133 (41.5) |
| Family history of CVD | men | 343 (13.4) | 208 (8.4) | - | - | - |
| | women | 601 (19.0) | 277 (10.6) | - | - | - |
| Family history of diabetes | men | 606 (23.6) | 221 (8.9) | - | - | - |
| | women | 1018 (32.1) | 296 (11.4) | - | - | - |

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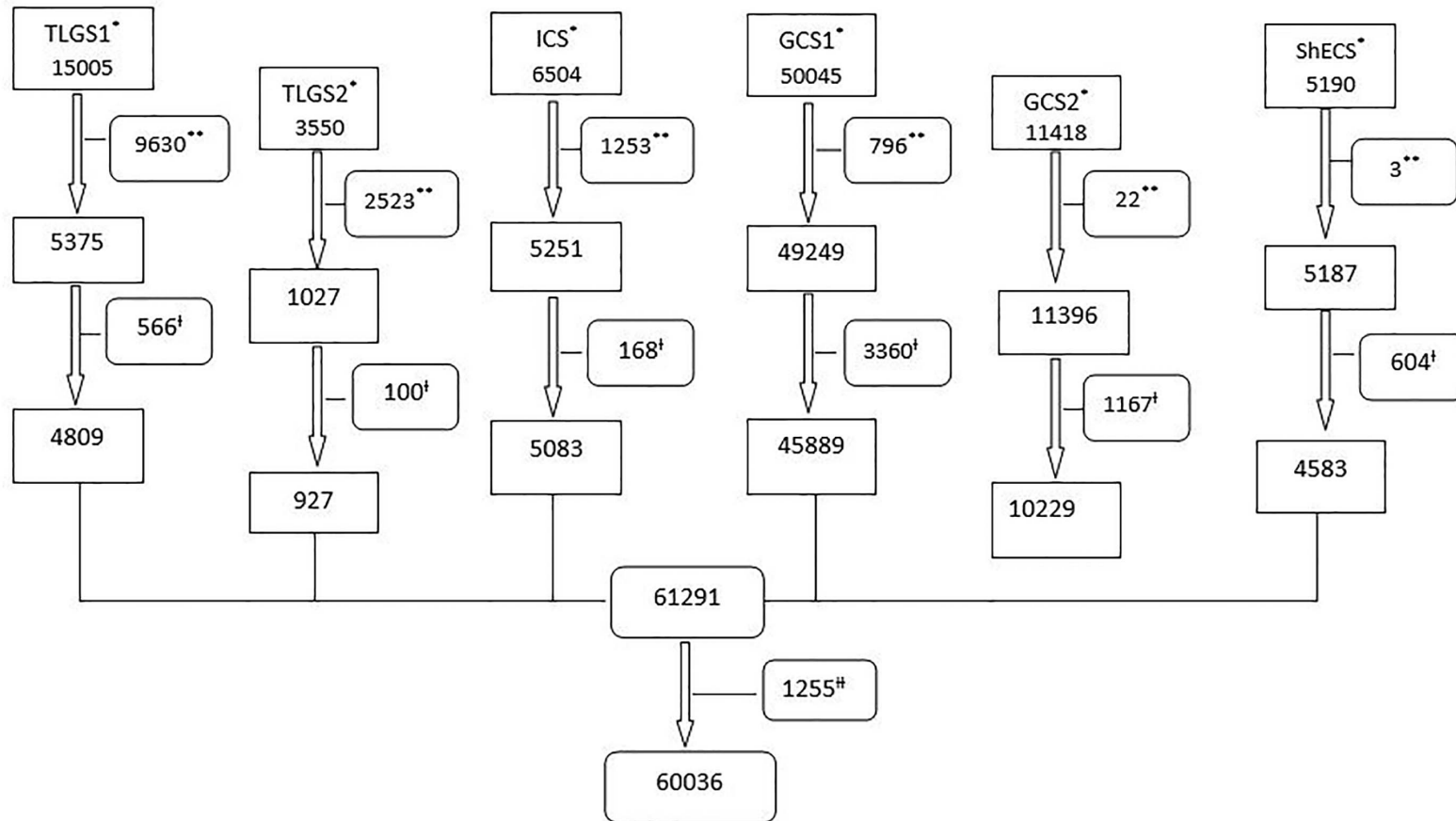
[†] Because of small sample size in TLGS2, the values of TLGS1 and TLGS2 have been reported as TLGS

[‡] Because of skewness in TG, the log transformation has been reported

[§] Diabetes was defined as FBS \geq 126 mg/dl or using glucose lowering medication. In ShECS, the definition was base on blood sugar \geq 200 mg/dl or using glucose lowering medication

[¥] Self reported diabetes was defined as diagnosis by physician or using glucose lowering medication

[¶] Hypertension was defined as SBP \geq 140 or DBP \geq 90 or using antihypertensive medication

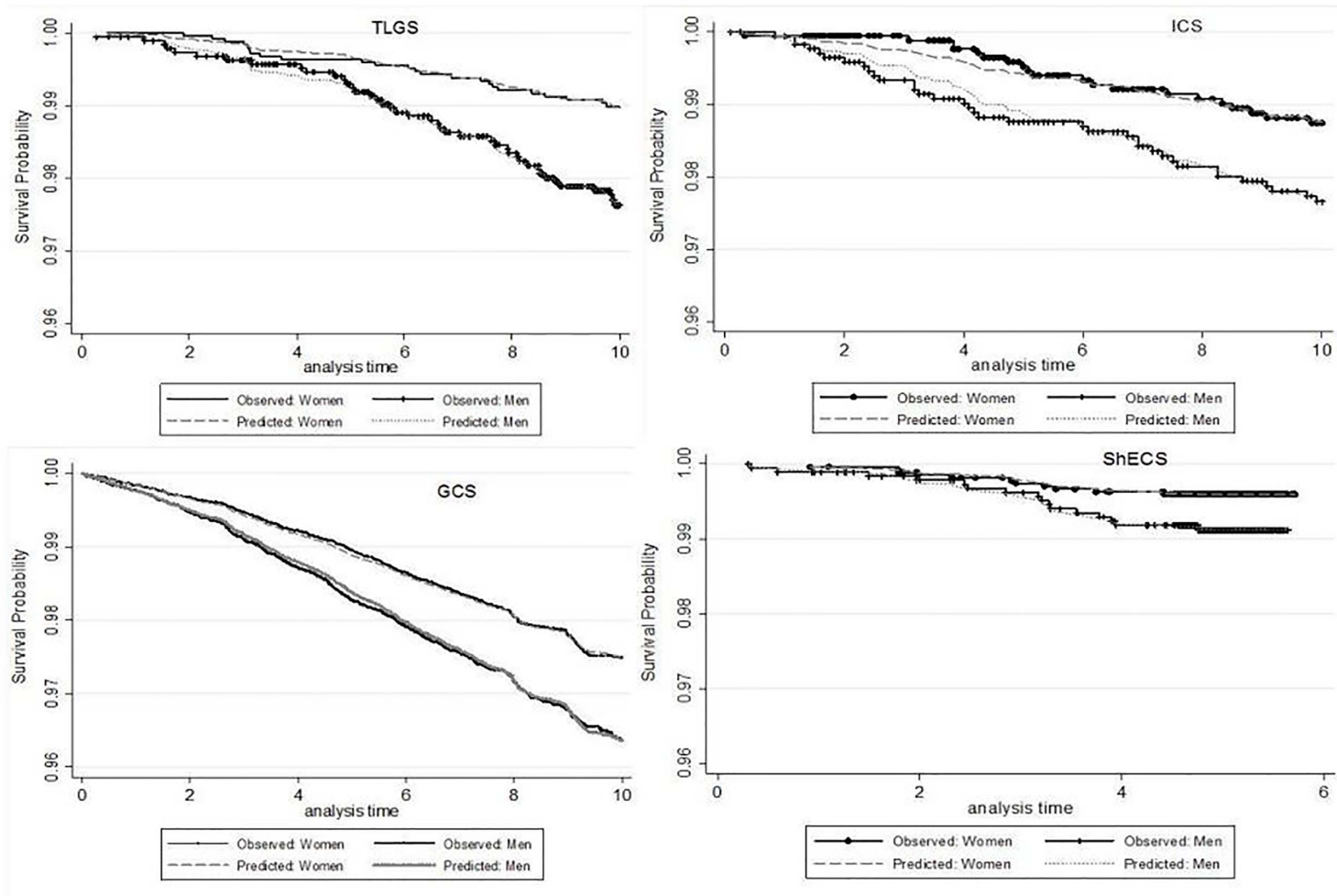


Supplementary Figure 1: Study participants' entry

*Excluded because of age<40 or age>80

**Excluded because of CVD history at baseline

† Loss to any follow up



Supplementary Figure 2: Kaplan-Meier and age-adjusted survival estimates by cohorts in men and women (40-65 yr)

References:

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3. Sarrafzadegan N, Talaei M, Sadeghi M, Kelishadi R, Oveisgharan S, Mohammadifard N, et al. The Isfahan cohort study: rationale, methods and main findings. *Journal of human hypertension*. 2011;25(9):545-53.
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5. Sepanlou SG, Barahimi H, Najafi I, Kamangar F, Poustchi H, Shakeri R, et al. Prevalence and determinants of chronic kidney disease in northeast of Iran: Results of the Golestan cohort study. *PloS one*. 2017;12(5):e0176540.
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