**Supplementary Material**

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## eAppendix 1. Data analysis overview and analytic notes for some individual cohorts

### 1.1 Overview:

As previously described,[1] the collaborating cohorts were asked to compile a dataset with approximately 25 variables (main exposure [serum creatinine to estimate GFR, albuminuria, age, sex, race/ethnicity, history of CVD, smoking, diabetes, systolic blood pressure, antihypertensive medications, total cholesterol, HDL cholesterol], outcome [cardiovascular mortality, fatal coronary heart disease, fatal stroke, myocardial infarction, ischemic stroke, hemorrhagic stroke]). To be consistent across cohorts, the CKD-PC Data Coordinating Center sent definitions for those variables to participating cohorts. We instructed studies not to impute any variables.

The CKD-PC data request and processing procedures are as follows. After obtaining opt-in preferences from cohorts for the topics for each phase, the Data Coordinating Center (DCC) requests de-identified data using a specific data request document describing the variables and preferred definitions needed for the current phase of the CKD-PC. Cohorts work with the DCC on any data use agreements, IRB approvals, and other logistic issues for de-identified data transfer. The DCC also advises on any differences in definitions or questions on data formatting. Cohorts then provide de-identified data (in whatever program format, e.g., Stata, SAS, csv) via a secure data transfer provided or their own secure transfer program/platform. Data is stored on a secure password protected network server that is only accessed by limited faculty and staff (<10). All those faculty and staff have completed HIPAA and CITI certification and have signed internal data use agreements to not use the data for any other than stated purposed and to not remove the data from that network drive. The CKD-PC does not share data with any external parties. Once data is received and stored in the network drive, the DCC programmer reviews the data and the data dictionary provided by the cohort to check for any missing information, outliers, and potentials issues with variable units, dates, etc. Any questions are sent to the cohort representatives for data checking and cleaning. Further data checking is done throughout the analysis process for each CKD-PC paper, including a review from a cohort representative of all tables and figures to confirm their cohort representation.

For 75 of the 81 cohorts in this specific study, the DCC at Johns Hopkins University conducted the analysis; the remainder ran the standard code written in Stata by the DCC and shared the output with the DCC. As in the data processing procedures above, the DCC works with the cohort to confirm the variable definitions and data formatting to prepare for the code. The standard code was designed to automatically save all estimates and variance-covariance matrices needed for the meta-analysis. Then the DCC meta-analyzed the estimates across cohorts using Stata.

As detailed in our previous reports,[2,3] each cohort was instructed to standardize their serum creatinine and report its method when available. The reported creatinine standardization allows grouping studies into studies that reported using a standard IDMS traceable method or conducted some serum creatinine standardization to IDMS traceable methods (ARIC, CanPREDDICT, CRIC, GCKD, Geisinger, GLOMMS, GoDARTS, Gubbio, ICES-KDT, LCC, Maccabi, MASTERPLAN, MMKD, NephroTest, RCAV, REGARDS, SCREAM, SEED, SRR-CKD, UK Biobank, West of Scotland CKD, UK Biobank) and studies where the creatinine standardization was not done (ADVANCE CRIB, MDRD, Nefrona, PSP-CKD, RENAAL, SHARP, SKS, SMART, Sunnybrook). For those cohorts without standardization, the creatinine levels were reduced by 5%, the calibration factor used to adjust non-standardized MDRD Study samples to IDMS.[2,4]. We did not adjust creatinine levels in those studies with unknown standardization status (CARE FOR HOMe, Hongkong CKD, Nanjing-CKD, Mt Sinai BioMe, OLDW all cohorts, and YWSCC).

We calculated eGFR using the CKD-EPI equation: $eGFR_{CKD\text{-}EPI} = 141 \times (\text{minimum of standardized serum creatinine [mg/dL]}/\kappa \text{ or } 1)^{\alpha} \times (\text{maximum of standardized serum creatinine [mg/dL]}/\kappa \text{ or } 1)^{-1.209} \times 0.993^{age} \times (1.018 \text{ if female}) \times (1.159 \text{ if black})$, where $\kappa$ is 0.7 if female and 0.9 if male and $\alpha$ is -0.329 if female and -0.411 if male.[5] The selection of knots for eGFR and urine albumin-to-creatinine ratio was based on clinical thresholds.[6] Baseline for each study was considered first available creatinine unless otherwise noted. Other variables were taken either on baseline date or within one year before baseline date.

### 1.2 Notes for individual cohorts:

ADVANCE: This study is a clinical trial which includes participants with diabetes only. Only Statin use was available as lipid lowering medication.

ARIC: Only Statin use was available as lipid lowering medication. Visit 4 was used as the baseline.

CanPREDDICT: Urine albumin-to-creatinine ratio measures were imputed by PCR measures when missing. Only Statin use was available as lipid lowering medication.

CRIB: Only Statin use was available as lipid lowering medication.

CRIC: Urine albumin-to-creatinine ratio measures were imputed by PCR measures when missing.

Geisinger: Urine albumin-to-creatinine ratio measures were imputed by PCR measures and then dipstick measurements when missing. Baseline was considered first available creatinine starting from Jan 1, 2008, and at least one year after entering the health system.

GLOMMS: Urine albumin-to-creatinine ratio measures were imputed by PCR measures when missing. Baseline was considered first available creatinine at least one year after entering the health system.

GoDARTS: Baseline was considered first available creatinine at least one year after entering the local health board authority area.

Hongkong CKD: Urine albumin-to-creatinine ratio measures were imputed by PCR measures when missing.

ICES-KDT: Urine albumin-to-creatinine ratio measures were imputed by PCR measures and then dipstick measurements when missing. Baseline was considered first available creatinine at least one year after entering the health system.

LCC: Urine albumin-to-creatinine ratio measures were imputed by PCR measures when missing. Only Statin use was available as lipid lowering medication.

Maccabi: Urine albumin-to-creatinine ratio measures above 300 were imputed by PCR measures. Baseline was considered first available creatinine starting from June 1, 2008, and at least one year after entering the health system.

MASTERPLAN: Urine albumin-to-creatinine ratio measures were imputed by PCR measures when missing.

MDRD: Urine albumin-to-creatinine ratio measures were imputed by PCR measures when missing.

MMKD: Urine albumin-to-creatinine ratio measures were imputed by PCR measures when missing.

Mt Sinai BioMe: Urine albumin-to-creatinine ratio measures were imputed by PCR measures and then dipstick measurements when missing. Baseline was considered first available creatinine starting from Jan 1, 2008, and at least one year after entering the health system. Only Statin use was available as lipid lowering medication.

Nanjing-CKD: Urine albumin-to-creatinine ratio measures were imputed by PCR measures when missing.

Nefrona: Participants free from previous cardiovascular disease at baseline.

NephroTest: Urine albumin-to-creatinine ratio measures were imputed by PCR measures when missing. Only Statin use was available as lipid lowering medication.

OLDW: This study used de-identified electronic health record (EHR) data from the Optum Labs Data Warehouse (OLDW). The database contains longitudinal health information on enrollees and patients, representing a mixture of ages, ethnicities and geographical regions across the United States. The EHR-derived data includes a subset of EHR data that has been normalized and standardized into a single database.[7] Cohort inclusion criteria was more than 50 events of KFRT before excluding missing values of main exposure variables and more than 4-year of 90$^{th}$ percentile of follow-up in events. Baseline was considered first available creatinine starting from Jan 1, 2012, and at least one year after entering the health system. Smoking status might be under measured in this study. Urine albumin-to-

creatinine ratio measures were imputed by PCR measures and then dipstick measurements when missing. We validated separately in each cohort in this study.

PSP-CKD: Urine albumin-to-creatinine ratio measures were imputed by PCR measures when missing. Only Statin use was available as lipid lowering medication. Baseline was considered first available creatinine after enrollment.

RCAV: Urine albumin-to-creatinine ratio measures were imputed by PCR measures and then dipstick measurements when missing. Baseline was considered first available creatinine at least one year after entering the health system.

REGARDS: Only Statin use was available as lipid lowering medication.

SCREAM: Urine albumin-to-creatinine ratio measures were imputed by dipstick measurements when missing. Baseline was considered first available creatinine starting from Jan 1, 2008, and at least one year after entering the health system.

SRR-CKD: Only Statin use was available as lipid lowering medication.

SKS: Urine albumin-to-creatinine ratio measures were imputed by PCR measures when missing.

Sunnybrook: Urine albumin-to-creatinine ratio measures were imputed by PCR measures when missing. Baseline was considered first available creatinine starting from Jan 1, 2001, and at least one year after entering the health system.

West of Scotland: Urine albumin-to-creatinine ratio measures were imputed by PCR measures when missing. Baseline was considered first available creatinine after enrollment.

YWSCC: Urine albumin-to-creatinine ratio measures were imputed by PCR measures when missing.

**1.3 Missing exposure variables, %**

| Cohort | N | Covariates | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | History of CHD | History of stroke | History of HF | History of AF | smoking | DM | HTN | SBP | Anti-HTN | cholesterol | HDL-C | lipid | BMI |
| ADVANCE | 11091 | 0 | 0 | 0 | 100 | 0.50 | 0 | 0 | 0.0090 | 0 | 0.018 | 0.13 | 0 | 0.027 |
| ARIC | 11527 | 2.0 | 0.22 | 1.7 | 1.3 | 0.62 | 0.49 | 0.41 | <0.1 | 0 | 0 | 0 | 0.29 | 0.19 |
| CanPREDDICT | 1894 | 0 | 0 | 0 | 100 | 100 | 0 | 0 | 1.7 | 0.11 | 50 | 53 | 0.11 | 100 |
| CARE FOR HOMe | 541 | 0 | 0 | 100 | 100 | 0 | 0 | 0 | 0.37 | 0 | 0 | 100 | 0 | 0 |
| CRIB | 264 | 0 | 0 | 100 | 100 | 0 | 0 | 0 | 1.5 | 0 | 4.2 | 19 | 0 | 0.76 |
| CRIC | 5494 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.073 | 0.75 | 29 | 29 | 0.75 | 0.56 |
| GCKD | 5128 | 0.039 | 1.1 | 5.1 | 2.6 | 0.29 | 0 | 0.059 | 0.60 | 0.70 | 0.14 | 0.21 | 0.70 | 1.0 |
| Geisinger | 366016 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9.9 | 0 | 40 | 40 | 0 | 17 |
| GLOMMS | 329977 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 100 | 0 | 56 | 56 | 0 | 100 |
| Go-DARTs | 17821 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 92 | 0 | 50 | 58 | 0 | 88 |
| Gubbio | 4597 | 0 | 0 | 0 | 0 | 0.24 | 0 | 0 | 0.15 | 0 | 0.044 | 0.022 | 0 | 1.5 |
| Hongkong CKD | 245 | 0 | 100 | 100 | 100 | 0 | 0 | 100 | 0 | 0 | 0.41 | 0.41 | 100 | 2.0 |
| ICES-KDT | 1017530 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 100 | 0 | 25 | 25 | 0 | 100 |
| LCC | 17132 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.61 | 0 | 4.4 | 7.0 | 0 | 5.0 |
| Maccabi | 1440372 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 30 | 0 | 16 | 17 | 0 | 35 |
| MASTERPLAN | 650 | 6.5 | 6.5 | 100 | 100 | 1.2 | 0 | 100 | 0 | 0 | 0.15 | 0.46 | 0 | 0 |
| MDRD | 1618 | 0 | 0 | 100 | 100 | 0.25 | 0.62 | 0 | 0 | 51 | 0.062 | 0.12 | 100 | 0.62 |
| MMKD | 172 | 0 | 0 | 100 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mt Sinai BioMe | 17446 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 5.2 | 0 | 32 | 34 | 0 | 14 |
| Nanjing CKD | 1275 | 5.9 | 6.7 | 100 | 100 | 19 | 2.4 | 1.6 | 23 | 2.9 | 19 | 50 | 100 | 72 |
| Nefrona | 1471 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.1 | 11 | 0 | 0 |
| NephroTest | 1757 | 0 | 0 | 0 | 100 | 0 | 0 | 0.17 | 3.5 | 0.11 | 1.5 | 4.3 | 0.11 | 0 |
| OLDW cohort 1 | 317354 | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 36 | 10 | 7.2 | 0 | 0 | 0 |
| OLDW cohort 2 | 88380 | 0 | 0 | 0 | 0 | 0 | 0 | 58 | 55 | 80 | 71 | 0 | 0 | 0 |
| OLDW cohort 3 | 110002 | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 37 | 99 | 95 | 0 | 0 | 0 |
| OLDW cohort 4 | 304007 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 41 | 11 | 18 | 0 | 0 | 0 |
| OLDW cohort 5 | 175556 | 0 | 0 | 0 | 0 | 0 | 0 | 47 | 43 | 38 | 36 | 0 | 0 | 0 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OLDW cohort 6 | 165729 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 45 | 6.4 | 10 | 0 | 0 | 0 |
| OLDW cohort 7 | 121413 | 0 | 0 | 0 | 0 | 0 | 0 | 46 | 42 | 3.9 | 2.9 | 0 | 0 | 0 |
| OLDW cohort 8 | 266591 | 0 | 0 | 0 | 0 | 0 | 0 | 34 | 30 | 23 | 22 | 0 | 0 | 0 |
| OLDW cohort 9 | 1473923 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 41 | 24 | 21 | 0 | 0 | 0 |
| OLDW cohort 10 | 1305648 | 0 | 0 | 0 | 0 | 0 | 0 | 46 | 42 | 10 | 8.0 | 0 | 0 | 0 |
| OLDW cohort 11 | 176874 | 0 | 0 | 0 | 0 | 0 | 0 | 54 | 50 | 69 | 66 | 0 | 0 | 0 |
| OLDW cohort 12 | 385105 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 24 | 10 | 9.1 | 0 | 0 | 0 |
| OLDW cohort 13 | 849173 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 36 | 15 | 25 | 0 | 0 | 0 |
| OLDW cohort 14 | 133785 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 43 | 13 | 10 | 0 | 0 | 0 |
| OLDW cohort 15 | 81203 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 35 | 96 | 95 | 0 | 0 | 0 |
| OLDW cohort 16 | 231809 | 0 | 0 | 0 | 0 | 0 | 0 | 49 | 46 | 99 | 97 | 0 | 0 | 0 |
| OLDW cohort 17 | 153560 | 0 | 0 | 0 | 0 | 0 | 0 | 34 | 30 | 3.8 | 2.1 | 0 | 0 | 0 |
| OLDW cohort 18 | 278097 | 0 | 0 | 0 | 0 | 0 | 0 | 43 | 40 | 96 | 92 | 0 | 0 | 0 |
| OLDW cohort 19 | 308518 | 0 | 0 | 0 | 0 | 0 | 0 | 44 | 41 | 32 | 28 | 0 | 0 | 0 |
| OLDW cohort 20 | 669837 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 44 | 14 | 14 | 0 | 0 | 0 |
| OLDW cohort 21 | 181418 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 44 | 13 | 14 | 0 | 0 | 0 |
| OLDW cohort 22 | 836079 | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 37 | 14 | 11 | 0 | 0 | 0 |
| OLDW cohort 23 | 365414 | 0 | 0 | 0 | 0 | 0 | 0 | 58 | 56 | 86 | 85 | 0 | 0 | 0 |
| OLDW cohort 24 | 543380 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 46 | 49 | 41 | 0 | 0 | 0 |
| OLDW cohort 25 | 537225 | 0 | 0 | 0 | 0 | 0 | 0 | 42 | 39 | 24 | 15 | 0 | 0 | 0 |
| OLDW cohort 26 | 1141213 | 0 | 0 | 0 | 0 | 0 | 0 | 51 | 49 | 21 | 20 | 0 | 0 | 0 |
| OLDW cohort 27 | 40674 | 0 | 0 | 0 | 0 | 0 | 0 | 37 | 33 | 65 | 63 | 0 | 0 | 0 |
| OLDW cohort 28 | 330566 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 53 | 19 | 18 | 0 | 0 | 0 |
| OLDW cohort 29 | 747255 | 0 | 0 | 0 | 0 | 0 | 0 | 52 | 49 | 19 | 18 | 0 | 0 | 0 |
| OLDW cohort 30 | 366530 | 0 | 0 | 0 | 0 | 0 | 0 | 54 | 51 | 35 | 33 | 0 | 0 | 0 |
| OLDW cohort 31 | 363900 | 0 | 0 | 0 | 0 | 0 | 0 | 46 | 42 | 45 | 43 | 0 | 0 | 0 |
| OLDW cohort 32 | 216369 | 0 | 0 | 0 | 0 | 0 | 0 | 58 | 56 | 33 | 28 | 0 | 0 | 0 |
| OLDW cohort 33 | 244814 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 44 | 17 | 15 | 0 | 0 | 0 |
| OLDW cohort 34 | 131205 | 0 | 0 | 0 | 0 | 0 | 0 | 43 | 39 | 28 | 23 | 0 | 0 | 0 |
| OLDW cohort 35 | 148535 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 42 | 6.6 | 6.1 | 0 | 0 | 0 |
| OLDW cohort 36 | 175418 | 0 | 0 | 0 | 0 | 0 | 0 | 51 | 48 | 8.4 | 8.7 | 0 | 0 | 0 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OLDW cohort 37 | 367461 | 0 | 0 | 0 | 0 | 0 | 0 | 54 | 51 | 56 | 52 | 0 | 0 | 0 |
| OLDW cohort 38 | 224879 | 0 | 0 | 0 | 0 | 0 | 0 | 52 | 50 | 13 | 14 | 0 | 0 | 0 |
| OLDW cohort 39 | 51457 | 0 | 0 | 0 | 0 | 0 | 0 | 54 | 50 | 47 | 47 | 0 | 0 | 0 |
| OLDW cohort 40 | 204235 | 0 | 0 | 0 | 0 | 0 | 0 | 38 | 34 | 12 | 12 | 0 | 0 | 0 |
| OLDW cohort 41 | 518142 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 47 | 52 | 46 | 0 | 0 | 0 |
| OLDW cohort 42 | 420302 | 0 | 0 | 0 | 0 | 0 | 0 | 44 | 38 | 13 | 16 | 0 | 0 | 0 |
| OLDW cohort 43 | 68240 | 0 | 0 | 0 | 0 | 0 | 0 | 33 | 30 | 2.9 | 2.1 | 0 | 0 | 0 |
| OLDW cohort 44 | 199070 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 27 | 9.1 | 9.0 | 0 | 0 | 0 |
| OLDW cohort 45 | 3136664 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 41 | 47 | 43 | 0 | 0 | 0 |
| PSP-CKD | 26072 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 15 | 0 | 26 | 82 | 0 | 26 |
| RCAV | 2237948 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3.7 | 0 | 46 | 34 | 0 | 13 |
| REGARDS | 28689 | 100 | 0.31 | 100 | 100 | 0.37 | 0.52 | 0.25 | 0.25 | 0 | 0 | 0.52 | 0 | 0.32 |
| RENAAL | 1510 | 0 | 0 | 0 | 100 | 0.26 | 0 | 0 | 0 | 0 | 0.99 | 1.5 | 100 | 2.3 |
| SCREAM | 696881 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 100 | 0 | 49 | 100 | 0 | 100 |
| SEED | 9512 | 0.17 | 0.13 | 100 | 100 | 0.14 | 1.3 | 0.28 | 0.042 | 0.94 | 0 | 0 | 100 | 0.49 |
| SHARP | 4790 | 0 | 0 | 100 | 100 | 0 | 0 | 0 | 0.17 | 0.17 | 11 | 11 | 0 | 2.0 |
| SKS | 2395 | 0 | 0 | 0 | 100 | 0 | 0 | 100 | 0 | 0 | 7.3 | 24 | 100 | 17 |
| SMART | 13010 | 0.20 | 0.22 | 0 | 100 | 0.0077 | 0.47 | 0 | 2.2 | 0.16 | 0 | 0.23 | 0.38 | 0 |
| SRR-CKD | 2559 | 2559 | 0 | 0 | 0 | 100 | 100 | 0 | 0.039 | 3.8 | 0 | 61 | 100 | 0 |
| Sunnybrook | 2524 | 2575 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 22 | 100 | 58 | 62 | 100 |
| UK Biobank | 463563 | 463563 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6.5 | 0 | 0.030 | 8 | 0 |
| West of Scotland | 2412 | 2412 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 98 | 0 | 54 | 63 | 0 |
| YWSCC | 869 | 869 | 0 | 0.23 | 0 | 0 | 28 | 0 | 0.12 | 0.23 | 100 | 0.69 | 2.5 | 100 |

AF: atrial fibrillation, BMI: body mass index, CHD: congestive heart failure; DM: diabetes mellitus, HDL-C: high-density lipoprotein cholesterol, HF: heart failure, HTN: hypertension, SBP: systolic blood pressure.

**1.4 CVD subtype and KFRT ascertainment**

1.4.1 ICD codes used to define CVD events if not specified

| **Outcome** | **ICD-9 codes** | **ICD-10 codes** |
|---|---|---|
| Myocardial infarction (MI) | 410 | I21, I22 |
| Hemorrhagic stroke | 431, 432 | I61, I62 |
| Ischemic stroke | 433.?1, 434.?1 | I63 |
| Heart failure (HF) | 428 | I50 |
| Atrial fibrillation (AF) | 427.3 | I48 |

1.4.2 Details of individual cohorts

| | **Cardiovascular disease ascertainment type** | **KFRT ascertainment type** |
|---|---|---|
| ADVANCE | • By ICD codes from hospital discharge | • Active |
| ARIC | • Adjudicated by a physician panel | • Linkage to the United States Renal Data System[8] |
| CanPREDDICT | • Adjudicated by a physician panel and linkage to BC Renal database via comorbidity reporting | • Active |
| CARE FOR HOMe | • By medical chart review (adjudicated by a physician panel) | • Active (with adjudicated by a physician panel) |
| CRIB | • By medical chart review | • By medical chart review |
| CRIC | • Adjudicated by a physician panel | • Active (with confirmation), Linkage |
| GCKD | • By medical chart review (adjudicated by a physician panel) | • Active (with adjudicated by a physician panel) |
| Geisinger | • By ICD codes from hospital discharge | • Linkage |
| GLOMMS | • By ICD codes from hospital discharge | • Linkage |
| GoDARTS | • Electronic health records -ICD codes | • Linkage |
| Gubbio | • By medical chart review | • Linkage |
| Hong Kong CKD | • By medical chart review and ICD codes from hospital discharge | • Active (with confirmation), Linkage |
| ICES-KDT | • By ICD codes from hospital discharge | • Linkage, Codes |
| LCC | • By ICD codes from hospital discharge and primary care records | • Codes |
| Maccabi | • By ICD codes from hospital discharge | • Active |
| MASTERPLAN | • Adjudicated by a physician panel | • Active |
| MDRD | • By medical chart review | • Active, Linkage |
| MMKD | • By medical chart review | • By medical chart review |
| Mt Sinai BioMe | • By ICD codes from hospital discharge | • Codes |
| Nanjing CKD | • By ICD codes from hospital discharge | • Electronic medical records |

| | | |
|---|---|---|
| Nefrona | • By ICD codes from referring physicians | • Linkage |
| NephroTest | • By medical chart review and ICD codes from the national death registry | • Linkage to the national REIN registry |
| OLDW cohorts | • By ICD codes from hospital discharge | • Codes |
| PSP-CKD | • Primary care records | • Codes |
| RCAV | • By ICD codes from hospital discharge | • Linkage |
| REGARDS | • Adjudicated by a physician panel | • Linkage to the United States Renal Data System[8] |
| RENAAL | • Adjudicated by a physician panel | • Active (with adjudication) |
| SCREAM | • By ICD codes from hospital discharge | • Linkage |
| SEED | • By ICD codes from hospital discharge | • Linkage |
| SHARP | • Active, followed by physician panel adjudication; AFwas active direct follow-up for serious atrial fibrillation (i.e.; hospitalisation or death) | • Active (followed by physician panel adjudication) |
| SKS | • Adjudicated by a physician panel | • Active |
| SMART | • Adjudicated by a physician panel | • Active (with adjudication) |
| SRR-CKD | • Linkage | • Active, Linkage |
| Sunnybrook | • Linkage to provincial data | • Linkage |
| UK Biobank | • By ICD codes from hospital discharge | • Linkage (Hospital Episode Statistics data managed by NHS Digital for England, NHS Wales Informatics Service's Information Services Division for Wales, and Information Services Division Scotland part of NHS National Services Scotland for Scotland) |
| West of Scotland | • By ICD codes from hospital discharge, supplemented with labs and imaging. | • Active (pulled from electronic medical records) |
| YWSCC | • By ICD codes from hospital discharge | • Linkage |

**Active**: self-report usually without specific chart validation. **Linkage**: linkage to a registry or database for the outcome. **Codes**: death certificate or registry coded cause or International Classification of Disease codes.

## eAppendix 2. Acronyms or abbreviations for cohorts included in the current study and their key references linked to the Web references

| | |
|---|---|
| ADVANCE | The Action in Diabetes and Vascular Disease: Preterax and Diamicron Modified Release Controlled Evaluation (ADVANCE) trial[9] |
| ARIC | Atherosclerosis Risk in Communities Study[10] |
| CanPREDDICT | Canadian Study of Prediction of Death, Dialysis and Interim Cardiovascular Events[11] |
| CARE FOR HOMe | The Cardiovascular and Renal Outcome in CKD 2-4 Patients—The Fourth Homburg evaluation |
| CRIB | Chronic Renal Impairment in Birmingham[12] |
| CRIC | Chronic Renal Insufficiency Cohort Study[13] |
| GCKD | German Chronic Kidney Disease Study[14] |
| Geisinger | Geisinger Health System[15] |
| GLOMMS | Grampian Laboratory Outcomes, Morbidity and Mortality Studies[16] |
| GoDARTS | Genetics of Diabetes Audit and Research in Tayside Scotland[17] |
| Gubbio | Gubbio Study[18] |
| Hong Kong CKD | Hong Kong CKD Studies[19] |
| ICES-KDT | Institute for Clinical Evaluative Sciences, Provincial Kidney, Dialysis and Transplantation program (ICES KDT)[20] |
| LCC | The Leicester City and County Chronic Kidney Disease Cohort[21] |
| Maccabi | Maccabi Health System[22] |
| MASTERPLAN | Multifactorial Approach and Superior Treatment Efficacy in Renal Patients with the Aid of a Nurse Practitioner[23] |
| MDRD | Modification of Diet in Renal Disease Study[24] |
| MMKD | Mild to Moderate Kidney Disease Study[25] |
| Mt Sinai BioMe | Mount Sinai BioMe Biobank Platform[26] |
| Nanjing CKD | Nanjing CKD Network Cohort |
| Nefrona | Observatorio Nacional de Aterosclerosis en Nefrologia[27] |
| NephroTest | NephroTest Study[28] |
| OLDW | Optum Labs Data Warehouse |
| PSP-CKD | Primary-Secondary Care Partnership to Prevent Adverse Outcomes in Chronic Kidney Disease[29] |
| RCAV | Racial and Cardiovascular Risk Anomalies in CKD Cohort[30] |
| REGARDS | Reasons for Geographic And Racial Differences in Stroke Study[31] |
| RENAAL | Reduction of Endpoints in NIDDM with the Angiotensin II Antagonist Losartan[32] |
| SCREAM | Stockholm CREAtinine Measurements Cohort[33] |
| SEED | Singapore Epidemiology of Eye Diseases[34] |
| SHARP | Study of Heart and Renal Protection |
| SKS | Salford Kidney Study[35] |
| SMART | Second Manifestations of ARTerial Disease Study |
| SRR-CKD | Swedish Renal Registry CKD Cohort[36] |
| Sunnybrook | Sunnybrook Cohort[37] |
| UK Biobank | The United Kingdom Biobank Study[38] |
| West of Scotland | West of Scotland study[39] |
| YWSCC | Yonsei Wonju Severance CKD Cohort |

## eAppendix 3. Acknowledgements and funding for collaborating cohorts

| Cohort | List of sponsors |
|---|---|
| ADVANCE | National Health and Medical Research Council (NHMRC) of Australia program grants 358395, 571281, 1052555 and 1149987 and project grant 211086 and research grants from Servier International |
| ARIC | The Atherosclerosis Risk in Communities study has been funded in whole or in part with Federal funds from the National Heart, Lung, and Blood Institute, National Institutes of Health, Department of Health and Human Services, under Contract nos. (HHSN268201700001I, HHSN268201700003I, HHSN268201700005I, HHSN268201700004I, HHSN2682017000021). The authors thank the staff and participants of the ARIC study for their important contributions. |
| CanPREDDICT | |
| CARE FOR HOMe | Supported by the Else Kröner-Fresenius Stiftung |
| CRIB | British Renal Society Project Grant Award<br>British Heart Foundation Project Grant Award. |
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| | information is available at the DaSH website: http://www.abdn.ac.uk/iahs/facilities/grampian-data-safe-haven.php. |
| GoDARTS | GoDARTS is funded and supported by the Wellcome Trust Type 2 Diabetes Case Control Collection (072960/Z/03/Z, 084726/Z/08/Z, 084727/Z/08/Z, 085475/Z/ 08/Z, 085475/B/08/Z) and as part of the EU IMI-SUMMIT programme). Tenovus Scotland and Diabetes UK grants. |
| Gubbio | Municipal and Health Authorities of Gubbio, Italy; Center of Gubbio Epidemiological Studies, Gubbio, Italy; University of Naples "Federico II", Naples, Italy. |
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| ICES-KDT | This study was conducted at the Institute for Clinical Evaluative Sciences (ICES) Western Site. ICES is funded by an annual grant from the Ontario Ministry of Health and Long-Term Care. ICES Western is funded by an operating grant from the Academic Medical Organization of Southwestern Ontario. This project was conducted with members of the provincial ICES Kidney, Dialysis and Transplantation Research Program (www.ices.on.ca/kdt), which receives programmatic grant funding from the Canadian Institutes of Health Research. Dr. Amit Garg is supported by the Dr. Adam Linton Chair in Kidney Health Analytics. Research personnel who worked on this project were supported by the Lilibeth Caberto Kidney Clinical Research Unit. We thank Gamma-Dynacare for the linked laboratory values used in this analysis. |
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| Maccabi | |
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| Nanjing CKD | |
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| OLDW | |

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| PSP-CKD | The PSP-CKD study was funded by the National Institute for Health Research (NIHR) Collaboration for Leadership in Applied Health Research and Care (CLAHRC) East Midlands. Ongoing support for the study is funded by NIHR CLAHRC East Midlands and Kidney Research UK (Grant TF2/2015). |
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| SHARP | SHARP was funded by Merck/Schering-Plough Pharmaceuticals (North Wales, PA), with additional support from the Australian National Health and Medical Research Council, the British Heart Foundation, and the UK Medical Research Council. SHARP was initiated, conducted, and interpreted independently of the principal study funder (Merck & Co. and Schering Plough Corp., which merged in 2009). The authors thank the participants in the SHARP trials, as well as the<br>local clinical center staff, regional and national coordinators, steering committees, and data monitoring committees. |
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| Sunnybrook | |
| UK Biobank | The UK Biobank was supported by the Medical Research Council, the Wellcome Trust, the UK Department of Health, the British Heart Foundation, Cancer Research UK, the US National Institute for Health Research, the Scottish Government, the North West Development Agency, Diabetes UK, and the Welsh Government (grants are listed here https://www.ukbiobank.ac.uk/wp-content/uploads/2018/10/Funding-UK-Biobank-summary.pdf). |
| West of Scotland | No Sponsors. Data collected as part of routine patient care. |

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| YWSCC | No sponsors. Data collected as part of CKD outpatient clinic |

## Table S1. Baseline characteristics, general covariates

| Cohort | N | Age, years | Female | Black | Smoker | | DM | HTN | SBP, mmHg | HTN meds | Total chol, mM | HDLC, mM | Lipid lowering meds€ | BMI, kg/m$^2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Current | Former | | | | | | | | |
| **Overall** | **25,903,761** | **53 (17)** | **52%** | **8.8%** | **7.8%** | **10%** | **15%** | **36%** | **126 (17)** | **18%** | **4.7 (1.0)** | **1.3 (0.4)** | **13%** | **30 (7)** |
| ADVANCE | 11091 | 66 (6) | 42% | 0.34% | 15% | 27% | 100% | 83% | 145 (22) | 75% | 5.2 (1.2) | 1.3 (0.4) | 28% | 28 (5) |
| ARIC | 11527 | 63 (6) | 56% | 22% | 15% | 44% | 17% | 48% | 128 (19) | 44% | 5.2 (1.0) | 1.3 (0.4) | 11% | 29 (6) |
| CanPREDDICT | 1894 | 68 (13) | 37% | 1.5% | NA | NA | 51% | 98% | 134 (20) | 92% | 4.2 (1.2) | 1.2 (0.4) | 68% | NA |
| CARE FOR HOMe | 541 | 65 (12) | 41% | 0.4% | 11% | 49% | 38% | 99% | 152 (24) | 96% | 5.0 (1.1) | NA | 51% | 30 (5) |
| CRIB | 264 | 61 (15) | 32% | 4.9% | 13% | 51% | 15% | 92% | 151 (23) | 80% | 5.7 (1.3) | 1.3 (0.4) | 17% | 27 (5) |
| CRIC | 5494 | 60 (11) | 44% | 44% | 13% | 41% | 51% | 88% | 128 (21) | 92% | 4.8 (1.2) | 1.2 (0.4) | 62% | 32 (8) |
| GCKD | 5128 | 61 (12) | 40% | 0% | 16% | 43% | 36% | 96% | 139 (20) | 95% | 5.5 (1.4) | 1.3 (0.5) | 52% | 30 (6) |
| Geisinger | 366016 | 54 (18) | 57% | 2.5% | 21% | 29% | 15% | 41% | 125 (17) | 45% | 4.9 (1.1) | 1.3 (0.4) | 30% | 31 (7) |
| GLOMMS | 329977 | 54 (18) | 56% | 0.0% | NA | NA | 3% | 10% | NA | 13% | 5.0 (1.1) | 1.4 (0.4) | 8% | NA |
| Go-DARTs | 17821 | 58 (12) | 47% | 0.0% | 15% | 39% | 30% | 41% | 134 (19) | 31% | 5.4 (1.1) | 1.4 (0.4) | 11% | 27 (5) |
| Gubbio | 4597 | 50 (18) | 55% | 0% | 30% | 23% | 5% | 34% | 128 (20) | 17% | 5.6 (1.1) | 1.3 (0.3) | 4% | 27 (4) |
| Hongkong CKD | 245 | 60 (11) | 41% | 0% | 13% | 23% | 43% | NA | 136 (19) | 97% | 4.8 (1.2) | 1.2 (0.4) | NA | 26 (5) |
| ICES-KDT | 1017530 | 60 (15) | 50% | 0% | NA | NA | 55% | 71% | NA | 29% | 4.6 (1.1) | 1.3 (0.4) | 23% | NA |
| LCC | 17132 | 77 (10) | 60% | 0.81% | 8.2% | 36% | 32% | 94% | 135 (16) | 89% | 4.6 (1.1) | 1.4 (0.4) | 64% | 28 (6) |
| Maccabi | 1440372 | 42 (17) | 55% | 0.00% | 24% | 5.8% | 6.7% | 18% | 122 (16) | 21% | 4.9 (1.0) | 1.3 (0.3) | 11% | 27 (5) |
| MASTERPLAN | 650 | 61 (13) | 31% | 0% | 16% | 79% | 24% | NA | 139 (21) | 94% | 4.8 (1.1) | 1.3 (0.4) | 68% | 27 (4) |
| MDRD | 1618 | 51 (13) | 39% | 13% | 12% | 0% | 6.2% | 60% | 132 (18) | 76% | 5.6 (1.2) | 1.0 (0.4) | NA | 27 (5) |
| MMKD | 172 | 46 (12) | 30% | 0% | 20% | 25% | 0% | 88% | 138 (21) | 80% | 5.8 (1.5) | 1.2 (0.4) | 20% | 25 (4) |
| Mt Sinai BioMe | 17446 | 53 (15) | 62% | 28% | 15% | 14% | 26% | 55% | 126 (19) | 44% | 4.8 (1.1) | 1.4 (0.5) | 21% | 29 (7) |
| Nanjing CKD | 1275 | 46 (14) | 43% | 0% | 0.49% | 17% | 22% | 77% | 141 (22) | 78% | 5.6 (1.9) | 1.2 (0.5) | NA | 24 (4) |
| Nefrona | 1471 | 60 (12) | 38% | 0.20% | 20% | 36% | 31% | 96% | 144 (21) | 92% | 4.8 (1.0) | 1.3 (0.4) | 68% | 29 (5) |
| NephroTest | 1757 | 59 (15) | 32% | 13% | 14% | 33% | 30% | 91% | 136 (20) | 89% | 4.9 (1.2) | 1.3 (0.8) | 44% | 27 (5) |
| OLDW cohort 1 | 317354 | 53 (17) | 60% | 13% | 6.9% | 17% | 16% | 43% | 126 (18) | 26% | 4.7 (0.9) | 1.3 (0.4) | 15% | 31 (8) |
| OLDW cohort 2 | 88380 | 51 (18) | 56% | 2% | 5.7% | 13% | 10% | 30% | 122 (16) | 13% | 4.7 (0.9) | 1.4 (0.4) | 6.6% | 29 (7) |
| OLDW cohort 3 | 110002 | 56 (16) | 58% | 10% | 4.8% | 16% | 20% | 51% | 128 (17) | 31% | 4.6 (0.9) | 1.3 (0.4) | 17% | 31 (7) |
| OLDW cohort 4 | 304007 | 56 (17) | 55% | 1% | 8.2% | 20% | 16% | 48% | 125 (17) | 32% | 4.7 (0.9) | 1.4 (0.4) | 18% | 31 (7) |
| OLDW cohort 5 | 175556 | 54 (17) | 58% | 0% | 10.5% | 9.0% | 11% | 31% | 126 (18) | 16% | 4.8 (0.9) | 1.4 (0.4) | 7.2% | 30 (7) |
| OLDW cohort 6 | 165729 | 56 (17) | 60% | 22% | 5.3% | 14% | 18% | 50% | 129 (18) | 26% | 4.7 (0.9) | 1.4 (0.4) | 14% | 30 (7) |
| OLDW cohort 7 | 121413 | 50 (16) | 60% | 10% | 4.0% | 11% | 14% | 38% | 126 (16) | 24% | 4.7 (0.8) | 1.3 (0.4) | 12% | 30 (7) |
| OLDW cohort 8 | 266591 | 49 (18) | 58% | 3% | 1.4% | 5% | 10% | 26% | 120 (15) | 15% | 4.7 (0.8) | 1.5 (0.4) | 10% | 28 (6) |
| OLDW cohort 9 | 1473923 | 53 (17) | 58% | 13% | 0.9% | 2% | 7.0% | 21% | 125 (17) | 13% | 4.7 (0.9) | 1.4 (0.4) | 7.8% | 30 (7) |
| OLDW cohort 10 | 1305648 | 50 (17) | 58% | 5% | 6.0% | 13% | 13% | 36% | 126 (17) | 22% | 4.7 (0.9) | 1.3 (0.4) | 10% | 30 (7) |
| OLDW cohort 11 | 176874 | 57 (17) | 56% | 4% | 12% | 12% | 13% | 41% | 122 (17) | 17% | 4.8 (0.9) | 1.3 (0.4) | 9.9% | 29 (7) |
| OLDW cohort 12 | 385105 | 47 (15) | 57% | 12% | 4.1% | 8.7% | 12% | 34% | 122 (15) | 22% | 4.7 (0.8) | 1.4 (0.4) | 12% | 30 (7) |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OLDW cohort 13 | 849173 | 51 (17) | 58% | 18% | 6.8% | 10% | 16% | 43% | 125 (17) | 22% | 4.7 (0.9) | 1.4 (0.4) | 12% | 29 (7) |
| OLDW cohort 14 | 133785 | 47 (15) | 58% | 8% | 10% | 5.9% | 25% | 43% | 130 (20) | 21% | 4.5 (0.9) | 1.2 (0.4) | 8.7% | 31 (8) |
| OLDW cohort 15 | 81203 | 49 (17) | 59% | 10% | 9.5% | 9.6% | 14% | 33% | 125 (17) | 19% | 4.7 (0.9) | 1.3 (0.4) | 9.9% | 29 (7) |
| OLDW cohort 16 | 231809 | 53 (17) | 58% | 5% | 12% | 17% | 14% | 41% | 126 (17) | 25% | 4.7 (0.9) | 1.3 (0.4) | 13% | 31 (8) |
| OLDW cohort 17 | 153560 | 54 (18) | 57% | 6% | 3.2% | 10% | 17% | 41% | 130 (18) | 29% | 4.6 (0.9) | 1.3 (0.4) | 18% | 30 (7) |
| OLDW cohort 18 | 278097 | 54 (17) | 58% | 2% | 4.7% | 11% | 10% | 33% | 130 (18) | 18% | 4.7 (0.9) | 1.5 (0.5) | 10% | 28 (6) |
| OLDW cohort 19 | 308518 | 51 (18) | 58% | 6% | 4.2% | 7.6% | 11% | 27% | 125 (16) | 12% | 4.6 (0.9) | 1.3 (0.4) | 6.1% | 30 (7) |
| OLDW cohort 20 | 669837 | 53 (17) | 57% | 10% | 5.7% | 14% | 14% | 37% | 126 (17) | 22% | 4.7 (0.9) | 1.3 (0.4) | 12% | 30 (8) |
| OLDW cohort 21 | 181418 | 52 (17) | 55% | 7% | 7.2% | 15.9% | 12% | 38% | 125 (17) | 26% | 4.7 (0.9) | 1.4 (0.4) | 14% | 30 (7) |
| OLDW cohort 22 | 836079 | 53 (18) | 59% | 10% | 2.3% | 6.2% | 11% | 30% | 124 (17) | 17% | 4.7 (0.9) | 1.5 (0.5) | 10% | 28 (6) |
| OLDW cohort 23 | 365414 | 50 (18) | 56% | 6% | 1.5% | 2.4% | 3.9% | 9.4% | 126 (18) | 2.5% | 4.7 (0.9) | 1.3 (0.4) | 1.3% | 29 (7) |
| OLDW cohort 24 | 543380 | 50 (18) | 56% | 5% | 4.3% | 7.8% | 8.2% | 23% | 126 (17) | 12% | 4.7 (0.9) | 1.4 (0.4) | 7.2% | 29 (7) |
| OLDW cohort 25 | 537225 | 51 (17) | 57% | 21% | 3.4% | 6.9% | 11% | 28% | 125 (18) | 17% | 4.7 (0.9) | 1.4 (0.4) | 8.3% | 30 (7) |
| OLDW cohort 26 | 1141213 | 51 (17) | 57% | 13% | 5.0% | 11% | 9.9% | 27% | 126 (18) | 16% | 4.7 (0.9) | 1.4 (0.4) | 8.2% | 29 (7) |
| OLDW cohort 27 | 40674 | 57 (17) | 57% | 12% | 4.7% | 10% | 15% | 46% | 128 (19) | 27% | 4.7 (0.9) | 1.4 (0.4) | 15% | 30 (7) |
| OLDW cohort 28 | 330566 | 54 (18) | 55% | 5% | 6.6% | 14% | 14% | 37% | 129 (18) | 13% | 4.7 (0.9) | 1.3 (0.4) | 6.0% | 30 (8) |
| OLDW cohort 29 | 747255 | 50 (17) | 56% | 4% | 4.2% | 8% | 10% | 29% | 124 (16) | 10% | 4.7 (0.9) | 1.3 (0.4) | 4.2% | 31 (8) |
| OLDW cohort 30 | 366530 | 54 (17) | 58% | 2% | 4.68% | 8.3% | 10% | 26% | 125 (17) | 14% | 4.7 (0.9) | 1.4 (0.4) | 6.6% | 29 (7) |
| OLDW cohort 31 | 363900 | 49 (17) | 54% | 2% | 1.4% | 2.7% | 3% | 10% | 125 (17) | 5% | 4.8 (0.8) | 1.4 (0.4) | 2.7% | 29 (6) |
| OLDW cohort 32 | 216369 | 53 (17) | 57% | 14% | 3.5% | 6.3% | 13% | 32% | 127 (18) | 12% | 4.7 (0.9) | 1.4 (0.4) | 5.6% | 30 (7) |
| OLDW cohort 33 | 244814 | 51 (16) | 59% | 6% | 7.9% | 11% | 14% | 34% | 125 (17) | 19% | 4.8 (0.9) | 1.4 (0.4) | 9.3% | 30 (8) |
| OLDW cohort 34 | 131205 | 52 (17) | 57% | 1% | 31% | 10% | 10% | 27% | 123 (16) | 10% | 4.7 (0.9) | 1.4 (0.4) | 4.9% | 29 (7) |
| OLDW cohort 35 | 148535 | 48 (16) | 56% | 6% | 9.2% | 14% | 10% | 25% | 123 (17) | 18% | 4.8 (0.9) | 1.3 (0.4) | 10% | 29 (7) |
| OLDW cohort 36 | 175418 | 52 (18) | 58% | 5% | 2.8% | 7.0% | 14% | 34% | 128 (18) | 23% | 4.6 (0.9) | 1.3 (0.4) | 12% | 31 (8) |
| OLDW cohort 37 | 367461 | 50 (17) | 59% | 8% | 1.9% | 3.1% | 5% | 12% | 126 (16) | 4.2% | 4.6 (0.9) | 1.3 (0.4) | 1.8% | 31 (8) |
| OLDW cohort 38 | 224879 | 53 (17) | 58% | 29% | 5.0% | 6.5% | 15% | 36% | 127 (18) | 18% | 4.6 (0.9) | 1.4 (0.4) | 9.8% | 30 (8) |
| OLDW cohort 39 | 51457 | 58 (17) | 56% | 0% | 5.1% | 6.1% | 13% | 40% | 127 (17) | 15% | 4.8 (0.9) | 1.4 (0.5) | 6.5% | 30 (7) |
| OLDW cohort 40 | 204235 | 48 (17) | 56% | 4% | 7.5% | 6.6% | 11% | 30% | 123 (17) | 17% | 4.7 (0.9) | 1.4 (0.4) | 10% | 29 (7) |
| OLDW cohort 41 | 518142 | 50 (17) | 58% | 11% | 1.6% | 3.7% | 8.6% | 23% | 128 (18) | 9% | 4.7 (0.9) | 1.4 (0.4) | 4% | 31 (8) |
| OLDW cohort 42 | 420302 | 50 (17) | 55% | 2% | 2.9% | 5.8% | 8.8% | 25% | 123 (16) | 15% | 4.9 (0.9) | 1.4 (0.4) | 8% | 29 (7) |
| OLDW cohort 43 | 68240 | 51 (17) | 67% | 8% | 2.1% | 4.3% | 13% | 34% | 125 (15) | 29% | 4.7 (0.8) | 1.4 (0.4) | 17% | 30 (7) |
| OLDW cohort 44 | 199070 | 55 (17) | 55% | 6% | 2.6% | 5.4% | 17% | 44% | 127 (16) | 37% | 4.7 (0.9) | 1.3 (0.4) | 23% | 31 (7) |
| OLDW cohort 45 | 3136664 | 53 (17) | 58% | 14% | 4.8% | 6.9% | 16% | 42% | 126 (18) | 19% | 4.7 (0.9) | 1.4 (0.4) | 11% | 30 (8) |
| PSP-CKD | 26072 | 75 (11) | 62% | 0.78% | 9.6% | 24% | 21% | 70% | 134 (16) | 23% | 4.4 (1.3) | 1.5 (0.5) | 23% | 29 (6) |
| RCAV | 2237948 | 63 (13) | 6.1% | 17% | 20% | 19% | 30% | 71% | 131 (17) | 5.2% | 4.6 (1.0) | 1.1 (0.4) | 36% | 29 (6) |
| REGARDS | 28689 | 65 (9) | 55% | 41% | 15% | 40% | 21% | 59% | 128 (17) | 59% | 5.0 (1.0) | 1.3 (0.4) | 31% | 29 (10) |
| RENAAL | 1510 | 60 (7) | 37% | 15% | 18% | NA | 100% | 100% | 153 (19) | 88% | 5.9 (1.4) | 1.2 (0.4) | NA | 30 (6) |
| SCREAM | 696881 | 57 (18) | 55% | 0% | NA | NA | 5.3% | 9% | NA | 37% | 5.3 (1.1) | 1.4 (0.4) | 15% | NA |
| SEED | 9512 | 59 (10) | 50% | 0% | 16% | 14% | 30.0% | 61% | 140 (22) | 34% | 5.4 (1.1) | 1.2 (0.4) | NA | 25 (5) |
| SHARP | 4790 | 63 (12) | 35% | 2.1% | 13% | 37% | 24% | 85% | 139 (21) | 88% | 5.1 (1.1) | 1.1 (0.3) | 0.042%* | 28 (5) |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SKS | 2395 | 64 (15) | 38% | 1.0% | 12% | 54% | 32% | NA | 138 (27) | 90% | 4.6 (1.3) | 1.4 (0.5) | NA | 28 (9) |
| SMART | 13010 | 57 (12) | 35% | 0% | 28% | 43% | 18% | 56% | 141 (22) | 66% | 5.1 (1.4) | 1.3 (0.4) | 55% | 27 (4) |
| SRR-CKD | 2559 | 68 (15) | 32% | 0% | NA | NA | 38% | 97% | 140 (22) | 92% | 5.1 (1.5) | NA | 44% | 28 (5) |
| Sunnybrook | 2524 | 63 (17) | 45% | 0% | 10% | 15% | 46% | 86% | 130 (20) | NA | 4.7 (1.2) | 1.3 (0.4) | NA | 30 (22) |
| UK Biobank | 463563 | 57 (8) | 54% | 2% | 10% | 35% | 5% | 50% | 140 (20) | 10% | 5.7 (1.1) | 1.4 (0.4) | 0.1792788 | 27 (5) |
| West of Scotland | 2412 | 70 (12) | 55% | 0% | NA | NA | 30% | 44% | 150 (28) | 99% | 4.6 (1.3) | 1.2 (0.4) | 99% | 28 (6) |
| YWSCC | 869 | 68 (12) | 29% | 0% | 3.4% | 18% | 57% | 86% | 130 (33) | NA | 4.1 (1.6) | 1.2 (0.5) | NA | 27 (11) |

Numbers provided are mean (SD) or percent unless otherwise stated.

€ Only statin use was available in ADVANCE, ARIC, CanPREDDICT, CRIB, LCC, Mt Sinai BioMe, NephroTest, PSP-CKD, REGARDS, SRR-CKD

*Pre-randomization value

BMI: body mass index, DM: diabetes mellitus, HDLC: high-density lipoprotein cholesterol, HTN: hypertension, SBP: systolic blood pressure, SD: standard deviation.

**Table S2. Baseline characteristics, kidney function/kidney damage covariates**

| Cohort | N | eGFR (SD), ml | ACR £ | | Dipstick | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | N | Median (IQI), mg/g | N | trace | + | ++ | >++ |
| **Overall** | **25,903,761** | **89 (23)** | **2178788** | **13 (6-36)** | **5605219** | **8.9%** | **6.8%** | **2.9%** | **0.90%** |
| ADVANCE | 11091 | 78 (17) | 10592 | 15 (7-40) | | | | | |
| ARIC | 11527 | 86 (16) | 11417 | 4 (2-8) | | | | | |
| CanPREDDICT | 1894 | 28 (9) | 1828 | 136 (26-723) | 411 | 3.6% | 3.2% | 14.4% | 25.8% |
| CARE FOR HOMe | 541 | 48 (18) | 503 | 42 (11-213) | | | | | |
| CRIB | 264 | 27 (9) | 216 | 284 (50-1029) | 254 | | 34.3% | 22.4% | 6.3% |
| CRIC | 5494 | 49 (16) | 5205 | 46 (8-368) | | | | | |
| GCKD | 5128 | 49 (18) | 5055 | 51 (10-387) | | | | | |
| Geisinger | 366016 | 88 (23) | 17455 | 8 (4-26) | | | | | |
| GLOMMS | 329977 | 91 (22) | 2590 | 9 (9-22) | | | | | |
| GoDARTS | 17821 | 83 (19) | 1369 | 106 (71-222) | | | | | |
| Gubbio | 4597 | 86 (17) | 1674 | 9 (4-14) | | | | | |
| Hongkong CKD | 245 | 23 (4) | 245 | 18 (5-67) | | | | | |
| ICES-KDT | 1017530 | 84 (22) | 339906 | 18 (7-29) | 413310 | 4.0% | 0.9% | 0.1% | 0.6% |
| LCC | 17132 | 52 (13) | 9242 | 70 (27-243) | | | | | |
| Maccabi | 1440372 | 104 (20) | 46250 | 10 (7-21) | | | | | |
| MASTERPLAN | 650 | 38 (14) | 597 | 97 (24-355) | | | | | |
| MDRD | 1618 | 44 (20) | 1573 | 60 (8-585) | | | | | |
| MMKD | 172 | 53 (28) | 169 | 2 (1-3) | | | | | |
| Mt Sinai BioMe | 17446 | 83 (24) | 1980 | 14 (6-78) | | | | | |
| Nanjing CKD | 1275 | 24 (4) | 936 | 1156 (574-2361) | 708 | 9.3% | 21.2% | 45.6% | 16.7% |
| Nefrona | 1471 | 36 (15) | 994 | 93 (14-423) | | | | | |
| NephroTest | 1757 | 46 (22) | 1738 | 72 (14-421) | | | | | |
| OLDW cohort 1 | 317354 | 86 (22) | 22138 | 14 (6-35) | 83688 | 9.2% | 5.9% | 2.5% | 1.1% |
| OLDW cohort 2 | 88380 | 88 (23) | 393 | 30 (17-98) | 22237 | 7.3% | 8.3% | 4.8% | 1.9% |
| OLDW cohort 3 | 110002 | 84 (23) | 2878 | 30 (26-30) | 40310 | 7.4% | 5.2% | 2.7% | 1.0% |
| OLDW cohort 4 | 304007 | 85 (23) | 18895 | 13 (6-37) | 78411 | 8.1% | 7.6% | 3.7% | 1.1% |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| OLDW cohort 5 | 175556 | 84 (22) | 8653 | 20 (9-57) | 33697 | 9.9% | 6.7% | 4.1% | 1.6% |
| OLDW cohort 6 | 165729 | 86 (25) | 9892 | 13 (6-39) | 57644 | 9.3% | 7.1% | 3.4% | 1.2% |
| OLDW cohort 7 | 121413 | 91 (22) | 6395 | 10 (5-27) | 29107 | 8.4% | 5.6% | 3.0% | 1.2% |
| OLDW cohort 8 | 266591 | 93 (21) | 19726 | 9 (4-24) | 139825 | 10.7% | 7.4% | 1.7% | 0.3% |
| OLDW cohort 9 | 1473923 | 88 (24) | 117412 | 16 (8-48) | 430832 | 6.8% | 8.9% | 4.3% | 1.1% |
| OLDW cohort 10 | 1305648 | 89 (23) | 57148 | 15 (6-46) | 297563 | 9.9% | 7.7% | 3.1% | 1.3% |
| OLDW cohort 11 | 176874 | 84 (22) | 4822 | 20 (8-69) | 25805 | 10.4% | 8.0% | 4.1% | 1.5% |
| OLDW cohort 12 | 385105 | 92 (21) | 30066 | 9 (4-26) | 166654 | 7.3% | 4.1% | 1.4% | 0.5% |
| OLDW cohort 13 | 849173 | 90 (24) | 45824 | 18 (7-50) | 274211 | 9.1% | 6.9% | 3.1% | 0.5% |
| OLDW cohort 14 | 133785 | 98 (24) | 17478 | 15 (7-58) | 27938 | 8.0% | 6.1% | 5.0% | 1.9% |
| OLDW cohort 15 | 81203 | 93 (23) | 1510 | 11 (5-32) | 25135 | 8.2% | 5.9% | 2.3% | 0.7% |
| OLDW cohort 16 | 231809 | 87 (23) | 10926 | 14 (7-45) | 81732 | 12.7% | 8.2% | 3.0% | 0.9% |
| OLDW cohort 17 | 153560 | 84 (23) | 9774 | 12 (6-36) | 77924 | 10.9% | 5.5% | 2.0% | 0.5% |
| OLDW cohort 18 | 278097 | 95 (23) | 10476 | 37 (19-103) | 98929 | 5.8% | 3.5% | 2.0% | 0.5% |
| OLDW cohort 19 | 308518 | 90 (24) | 14501 | 16 (7-49) | 67715 | 10.7% | 8.9% | 2.3% | 1.1% |
| OLDW cohort 20 | 669837 | 88 (23) | 39282 | 12 (6-36) | 159887 | 10.5% | 6.6% | 2.8% | 0.9% |
| OLDW cohort 21 | 181418 | 85 (23) | 12922 | 26 (10-93) | 51610 | 6.9% | 6.0% | 3.6% | 1.2% |
| OLDW cohort 22 | 836079 | 89 (22) | 57933 | 13 (6-41) | 331500 | 6.3% | 5.0% | 2.3% | 0.4% |
| OLDW cohort 23 | 365414 | 94 (24) | 15132 | 12 (6-37) | 125154 | 7.9% | 9.2% | 3.9% | 0.7% |
| OLDW cohort 24 | 543380 | 90 (23) | 15749 | 15 (7-41) | 158466 | 4.7% | 9.0% | 4.3% | 0.6% |
| OLDW cohort 25 | 537225 | 98 (25) | 32633 | 15 (7-48) | 135182 | 10.2% | 9.8% | 3.4% | 0.9% |
| OLDW cohort 26 | 1141213 | 90 (23) | 51174 | 15 (6-48) | 303108 | 11.3% | 8.7% | 3.6% | 1.1% |
| OLDW cohort 27 | 40674 | 85 (24) | 2271 | 8 (4-25) | 16329 | 7.4% | 4.0% | 1.8% | 0.5% |
| OLDW cohort 28 | 330566 | 87 (24) | 21695 | 17 (7-45) | 74945 | 10.5% | 7.3% | 3.4% | 1.3% |
| OLDW cohort 29 | 747255 | 90 (23) | 28924 | 17 (8-52) | 135828 | 8.8% | 7.1% | 3.5% | 1.2% |
| OLDW cohort 30 | 366530 | 84 (22) | 12907 | 17 (7-55) | 61312 | 11.8% | 6.6% | 2.8% | 1.0% |
| OLDW cohort 31 | 363900 | 89 (21) | 18097 | 13 (6-39) | 83506 | 9.9% | 7.4% | 1.4% | 0.7% |
| OLDW cohort 32 | 216369 | 87 (23) | 6864 | 10 (4-30) | 58929 | 9.5% | 6.4% | 2.9% | 1.1% |
| OLDW cohort 33 | 244814 | 91 (22) | 16045 | 14 (5-47) | 46742 | 10.3% | 8.1% | 3.7% | 1.3% |
| OLDW cohort 34 | 131205 | 90 (22) | 4306 | 15 (8-42) | 21696 | 21.0% | 9.9% | 2.9% | 1.1% |
| OLDW cohort 35 | 148535 | 90 (22) | 7406 | 10 (5-34) | 48907 | 21.2% | 11.0% | 3.4% | 1.1% |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| OLDW cohort 36 | 175418 | 90 (24) | 7115 | 30 (9-98) | 28088 | 9.8% | 7.5% | 1.1% | 0.3% |
| OLDW cohort 37 | 367461 | 90 (24) | 19495 | 11 (5-31) | 91909 | 12.3% | 7.5% | 4.1% | 1.2% |
| OLDW cohort 38 | 224879 | 90 (25) | 14731 | 12 (5-42) | 45990 | 11.9% | 7.8% | 4.0% | 2.3% |
| OLDW cohort 39 | 51457 | 86 (22) | 779 | 21 (10-54) | 8645 | 6.2% | 7.0% | 3.6% | 1.3% |
| OLDW cohort 40 | 204235 | 91 (22) | 15597 | 12 (5-38) | 54628 | 10.7% | 8.2% | 3.6% | 1.2% |
| OLDW cohort 41 | 518142 | 94 (24) | 29663 | 13 (6-38) | 83159 | 5.9% | 9.8% | 4.0% | 0.7% |
| OLDW cohort 42 | 420302 | 92 (21) | 24600 | 12 (5-39) | 76026 | 13.0% | 6.4% | 3.4% | 1.3% |
| OLDW cohort 43 | 68240 | 89 (23) | 8803 | 13 (6-37) | 11855 | 6.1% | 4.3% | 1.4% | 0.5% |
| OLDW cohort 44 | 199070 | 85 (21) | 5304 | 23 (11-67) | 20271 | 8.2% | 6.1% | 2.8% | 0.9% |
| OLDW cohort 45 | 3136664 | 88 (23) | 172026 | 13 (6-39) | 807468 | 10.0% | 7.1% | 2.7% | 0.9% |
| PSP-CKD | 26072 | 55 (14) | 5998 | 18 (11-47) | 6325 | 8.8% | 9.2% | 4.8% | 3.3% |
| RCAV | 2237948 | 80 (17) | 142892 | 13 (5-44) | | | | | |
| REGARDS | 28689 | 85 (20) | 27598 | 7 (5-16) | | | | | |
| RENAAL | 1510 | 39 (12) | 1510 | 1242 (557-2545) | | | | | |
| SCREAM | 696881 | 89 (21) | 14892 | 9 (4-24) | 82652 | 10.7% | 4.1% | 1.8% | |
| SEED | 9512 | 84 (19) | 6819 | 13 (7-28) | | | | | |
| SHARP | 4790 | 30 (11) | 3909 | 147 (32-625) | | | | | |
| SKS | 2395 | 35 (15) | 1580 | 55 (17-342) | | | | | |
| SMART | 13010 | 84 (19) | 6999 | 9 (5-23) | | | | | |
| SRR-CKD | 2559 | 27 (11) | 2556 | 171 (34-838) | | | | | |
| Sunnybrook | 2524 | 54 (29) | 920 | 76 (17-333) | 198 | 5.1% | 21.2% | 13.1% | 8.1% |
| UK Biobank | 463563 | 91 (13) | 450454 | 6 (4-10) | | | | | |
| West of Scotland | 2412 | 41 (11) | 338 | 4 (2-15) | 29 | 13.8% | 10.3% | 13.8% | 17.2% |
| YWSCC | 869 | 39 (16) | 429 | 131 (33-589) | 835 | 1.2% | 23.2% | 15.4% | 8.7% |

Numbers provided are mean (SD) or percent unless otherwise stated.

₤ PCR was converted to ACR when ACR was not available in CanPREDDICT, CRIC, Geisinger, Hongkong CKD, LCC, MASTERPLAN, MDRD, MMKD, Mt Sinai BioMe, Nanjing CKD, Nefrona, NephroTest, OLDW all cohorts, PSP-CKD, SKS, Sunnybrook, YWSCC

## Table S3. Number of participants with a history of CVD events and incident CVD events.

| Cohort | N | Coronary Heart Disease | | | | Stroke | | | | Heart Failure | | | | Atrial fibrillation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Hx | Hx < 1y | Inc | Age (SD) | Hx | Hx < 1y | Inc | Age (SD) | Hx | Hx < 1y | Inc | Age (SD) | Hx | Hx < 1y | Inc | Age (SD) |
| **Overall** | **25,903,761** | **2,450,902** | **697234** | **269,142** | **69 (13)** | **824717** | **299769** | **311021** | **71 (13)** | **848609** | **313975** | **712556** | **72 (12)** | **1071615** | **326720** | **605596** | **73 (11)** |
| ADVANCE | 11091 | 1769 | NA | 470 | 72 (7) | 1019 | NA | 724 | 73 (7) | 355 | NA | 305 | 73 (7) | NA | NA | NA | NA |
| ARIC | 11527 | 971 | 51 | 963 | 74 (8) | 262 | 26 | 905 | 76 (7) | 629 | 90 | 2059 | 77 (8) | 288 | 94 | 2412 | 76 (7) |
| CanPREDDICT | 1894 | 493 | NA | 63 | 73 (13) | 169 | NA | 47 | 74 (10) | 250 | NA | 105 | 75 (10) | NA | NA | NA | NA |
| CARE FOR HOMe | 541 | 118 | NA | 5 | 71 (9) | 52 | NA | 16 | 72 (9) | NA | NA | 39 | 75 (8) | NA | NA | NA | NA |
| CRIB | 264 | 56 | NA | NA | NA | 18 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| CRIC | 5494 | 1185 | NA | 228 | 65 (10) | 572 | NA | 155 | 66 (9) | 535 | NA | 555 | 66 (10) | 942 | NA | 365 | 69 (8) |
| GCKD | 5128 | 1020 | NA | 131 | 68 (9) | 421 | NA | 153 | 69 (8) | 911 | NA | 199 | 71 (8) | 1041 | NA | 182 | 71 (7) |
| Geisinger | 366016 | 44093 | 7819 | 4148 | 70 (14) | 14445 | 4054 | 3928 | 73 (13) | 14462 | 3993 | 13730 | 75 (13) | 17411 | 4188 | 12519 | 74 (12) |
| GLOMMS | 329977 | 10816 | 2054 | 196 | 78 (10) | 6226 | 1245 | 8675 | 76 (12) | 4953 | 1165 | 7654 | 77 (12) | 8209 | 1699 | 11863 | 77 (11) |
| GoDARTS | 17821 | 2209 | 345 | NA | NA | 240 | 71 | NA | NA | 109 | 35 | NA | NA | 293 | 98 | NA | NA |
| Gubbio | 4597 | 117 | NA | NA | NA | 39 | NA | NA | NA | 122 | NA | NA | NA | 32 | NA | NA | NA |
| Hongkong CKD | 245 | 53 | NA | NA | NA | NA | NA | 12 | 67 (9) | NA | NA | NA | NA | NA | NA | 13 | 72 (7) |
| ICES-KDT | 1017530 | 89760 | 6998 | 26068 | 73 (13) | 17672 | 2086 | 20456 | 76 (11) | 92517 | 10001 | 35194 | 77 (11) | 203066 | 15569 | 26567 | 76 (10) |
| LCC | 17132 | 4354 | NA | 383 | 82 (9) | 2109 | NA | 790 | 84 (8) | 1669 | NA | NA | NA | 921 | NA | NA | NA |
| Maccabi | 1440372 | 44639 | 5987 | 8438 | 67 (14) | 7026 | 1575 | 11536 | 72 (14) | 6904 | 1507 | 15004 | 76 (13) | NA | NA | NA | NA |
| MASTERPLAN | 650 | 121 | NA | 6 | 67 (10) | 42 | NA | 9 | 71 (14) | NA | NA | 26 | 71 (7) | NA | NA | NA | NA |
| MDRD | 1618 | 136 | NA | NA | NA | 41 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| MMKD | 172 | 11 | NA | 4 | 60 (6) | 10 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Mt Sinai BioMe | 17446 | 709 | 110 | 422 | 65 (11) | 766 | 175 | 590 | 66 (13) | 1494 | 314 | 931 | 64 (13) | NA | NA | NA | NA |
| Nanjing CKD | 1275 | 68 | NA | 6 | 61 (13) | 50 | NA | 10 | 58 (13) | 23 | NA | 14 | 54 (19) | NA | NA | NA | NA |
| Nefrona | 1471 | NA | NA | NA | NA | NA | NA | NA | NA | 35 | NA | NA | NA | 41 | NA | NA | NA |
| NephroTest | 1757 | 255 | NA | NA | NA | 89 | NA | NA | NA | 72 | NA | NA | NA | NA | NA | NA | NA |
| OLDW cohort 1 | 317354 | 34673 | 11891 | 3281 | 67 (13) | 15572 | 5428 | 4235 | 69 (13) | 13177 | 6056 | 11550 | 71 (12) | 13006 | 4862 | 9147 | 72 (11) |
| OLDW cohort 2 | 88380 | 7805 | 3121 | 670 | 67 (13) | 4241 | 1662 | 794 | 69 (13) | 2626 | 1355 | 2009 | 72 (12) | 3994 | 1770 | 1914 | 72 (11) |
| OLDW cohort 3 | 110002 | 13024 | 3007 | 452 | 70 (11) | 7573 | 1839 | 447 | 72 (11) | 3813 | 1431 | 1388 | 74 (9) | 6668 | 1940 | 1268 | 74 (9) |
| OLDW cohort 4 | 304007 | 40112 | 8223 | 3325 | 71 (12) | 18996 | 4731 | 3969 | 72 (12) | 16988 | 5246 | 11427 | 74 (10) | 19709 | 5011 | 9060 | 74 (10) |
| OLDW cohort 5 | 175556 | 15467 | 4682 | 1683 | 69 (12) | 6682 | 2461 | 2287 | 71 (13) | 8807 | 3729 | 5523 | 72 (12) | 7344 | 2672 | 5048 | 73 (10) |
| OLDW cohort 6 | 165729 | 18058 | 4020 | 1238 | 70 (12) | 9011 | 2934 | 2234 | 72 (11) | 7139 | 2621 | 4618 | 73 (11) | 9299 | 2643 | 3658 | 74 (10) |
| OLDW cohort 7 | 121413 | 8519 | 2275 | 520 | 68 (13) | 3988 | 1571 | 622 | 68 (13) | 2385 | 966 | 1293 | 72 (11) | 3424 | 1054 | 1172 | 72 (11) |
| OLDW cohort 8 | 266591 | 13634 | 3964 | 802 | 73 (12) | 10081 | 2745 | 967 | 73 (12) | 2940 | 1044 | 2327 | 77 (9) | 6610 | 2115 | 2402 | 75 (10) |
| OLDW cohort 9 | 1473923 | 65335 | 28429 | 10368 | 69 (12) | 22876 | 10303 | 17341 | 70 (13) | 18624 | 10018 | 32165 | 73 (12) | 27952 | 13508 | 31263 | 73 (11) |
| OLDW cohort 10 | 1305648 | 106778 | 34944 | 12275 | 66 (13) | 49969 | 17966 | 15751 | 69 (13) | 41687 | 18280 | 34595 | 71 (12) | 45616 | 16692 | 30662 | 72 (11) |
| OLDW cohort 11 | 176874 | 16319 | 3690 | 1089 | 70 (12) | 8741 | 2285 | 1973 | 73 (11) | 7686 | 3107 | 4206 | 74 (11) | 11190 | 3201 | 3628 | 74 (10) |
| OLDW cohort 12 | 385105 | 22053 | 7220 | 1039 | 62 (12) | 8716 | 3506 | 1427 | 64 (13) | 6808 | 3018 | 2796 | 67 (13) | 9040 | 3339 | 2858 | 67 (12) |
| OLDW cohort 13 | 849173 | 86503 | 26687 | 5912 | 66 (13) | 43760 | 16694 | 11614 | 68 (13) | 33251 | 13391 | 21763 | 70 (12) | 35620 | 11896 | 19206 | 71 (11) |
| OLDW cohort 14 | 133785 | 9427 | 2881 | 670 | 58 (12) | 4181 | 1380 | 867 | 58 (12) | 3566 | 1280 | 1644 | 60 (12) | 2044 | 714 | 1191 | 64 (12) |
| OLDW cohort 15 | 81203 | 4080 | 1426 | 306 | 67 (12) | 2060 | 738 | 534 | 70 (13) | 1170 | 506 | 1084 | 72 (12) | 1833 | 674 | 1194 | 73 (10) |
| OLDW cohort 16 | 231809 | 18982 | 7132 | 2323 | 69 (13) | 8868 | 3287 | 2379 | 72 (12) | 5021 | 2490 | 5177 | 74 (11) | 8033 | 3179 | 5586 | 74 (10) |
| OLDW cohort 17 | 153560 | 14036 | 4878 | 2415 | 72 (11) | 5653 | 2570 | 3248 | 74 (11) | 3434 | 1741 | 6152 | 76 (9) | 6700 | 2363 | 6474 | 75 (9) |
| OLDW cohort 18 | 278097 | 22333 | 8938 | 1749 | 73 (11) | 9516 | 4364 | 2336 | 74 (10) | 7336 | 3636 | 5448 | 76 (9) | 14028 | 5529 | 5067 | 75 (9) |
| OLDW cohort 19 | 308518 | 21955 | 10212 | 4172 | 68 (14) | 9947 | 4319 | 4261 | 70 (13) | 8383 | 4958 | 10242 | 73 (12) | 11344 | 5645 | 8922 | 73 (12) |
| OLDW cohort 20 | 669837 | 56983 | 20607 | 6613 | 68 (13) | 25423 | 9601 | 7976 | 70 (13) | 20803 | 9810 | 18872 | 72 (12) | 25207 | 9468 | 16121 | 72 (11) |
| OLDW cohort 21 | 181418 | 13162 | 4469 | 1564 | 68 (13) | 6092 | 2206 | 1793 | 71 (12) | 4977 | 2263 | 3903 | 73 (12) | 7072 | 2611 | 3516 | 73 (11) |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OLDW cohort 22 | 836079 | 80445 | 30522 | 6856 | 71 (13) | 28038 | 11733 | 3873 | 71 (14) | 19888 | 9478 | 11244 | 75 (11) | 34517 | 13404 | 9902 | 74 (11) |
| OLDW cohort 23 | 365414 | 8510 | 4453 | 6562 | 69 (14) | 3088 | 1538 | 5344 | 68 (14) | 3425 | 2271 | 10720 | 73 (12) | 4466 | 2464 | 10855 | 73 (12) |
| OLDW cohort 24 | 543380 | 29788 | 15742 | 2898 | 66 (13) | 11220 | 5688 | 4368 | 70 (13) | 8448 | 5558 | 10752 | 72 (12) | 14167 | 8425 | 10397 | 71 (11) |
| OLDW cohort 25 | 537225 | 33329 | 14851 | 12712 | 69 (13) | 11646 | 5825 | 9551 | 70 (13) | 13159 | 6522 | 23215 | 72 (12) | 12945 | 6942 | 19468 | 73 (11) |
| OLDW cohort 26 | 1141213 | 80464 | 34212 | 10363 | 66 (13) | 35196 | 15283 | 12886 | 67 (14) | 31877 | 17152 | 32317 | 70 (13) | 41920 | 19077 | 28663 | 71 (12) |
| OLDW cohort 27 | 40674 | 6597 | 2515 | 445 | 73 (12) | 2003 | 905 | 491 | 73 (12) | 2538 | 1239 | 1428 | 76 (10) | 3950 | 1495 | 1100 | 75 (10) |
| OLDW cohort 28 | 330566 | 41110 | 19840 | 7250 | 70 (12) | 16006 | 7129 | 9066 | 71 (13) | 12257 | 7049 | 20524 | 73 (12) | 15297 | 7622 | 17798 | 73 (11) |
| OLDW cohort 29 | 747255 | 44897 | 19370 | 7979 | 67 (13) | 19124 | 7442 | 8149 | 69 (14) | 16046 | 9557 | 21577 | 72 (12) | 22424 | 11190 | 18037 | 72 (12) |
| OLDW cohort 30 | 366530 | 29258 | 14423 | 4393 | 70 (12) | 9629 | 4896 | 5574 | 72 (12) | 10583 | 6063 | 15036 | 73 (11) | 14600 | 7616 | 14288 | 74 (10) |
| OLDW cohort 31 | 363900 | 8712 | 3676 | 3023 | 69 (14) | 3581 | 1681 | 2629 | 70 (14) | 2283 | 1304 | 6717 | 73 (12) | 5527 | 2530 | 7534 | 73 (12) |
| OLDW cohort 32 | 216369 | 18587 | 8644 | 1381 | 67 (13) | 6833 | 3208 | 1783 | 68 (13) | 8041 | 4126 | 6197 | 70 (12) | 8846 | 4591 | 5226 | 71 (12) |
| OLDW cohort 33 | 244814 | 16169 | 7214 | 2709 | 67 (13) | 7160 | 3202 | 1915 | 68 (13) | 7461 | 4044 | 5738 | 68 (13) | 8736 | 3967 | 4307 | 70 (12) |
| OLDW cohort 34 | 131205 | 7435 | 2810 | 1358 | 69 (13) | 3669 | 1369 | 1613 | 70 (13) | 2647 | 1540 | 3570 | 73 (11) | 4573 | 1898 | 3114 | 73 (11) |
| OLDW cohort 35 | 148535 | 7432 | 2210 | 1584 | 65 (14) | 3396 | 968 | 1000 | 64 (15) | 3187 | 1156 | 2082 | 67 (14) | 3693 | 1098 | 1715 | 68 (12) |
| OLDW cohort 36 | 175418 | 16010 | 5447 | 2350 | 68 (13) | 6041 | 2484 | 2644 | 69 (13) | 5155 | 2638 | 6590 | 71 (12) | 6951 | 2875 | 5783 | 72 (12) |
| OLDW cohort 37 | 367461 | 10624 | 4701 | 4990 | 67 (14) | 3257 | 1643 | 4535 | 68 (14) | 3723 | 2099 | 13351 | 71 (13) | 4598 | 2355 | 12811 | 72 (12) |
| OLDW cohort 38 | 224879 | 21207 | 9920 | 4352 | 67 (13) | 8112 | 4210 | 4146 | 68 (13) | 8174 | 4428 | 9845 | 69 (13) | 8410 | 4419 | 7540 | 71 (12) |
| OLDW cohort 39 | 51457 | 6670 | 1696 | 305 | 69 (11) | 2086 | 659 | 392 | 74 (11) | 1907 | 747 | 1039 | 74 (10) | 3637 | 926 | 908 | 74 (10) |
| OLDW cohort 40 | 204235 | 12358 | 2281 | 1959 | 67 (14) | 5885 | 1223 | 2420 | 70 (14) | 4289 | 1225 | 5384 | 74 (12) | 6739 | 1487 | 4754 | 74 (11) |
| OLDW cohort 41 | 518142 | 28493 | 13247 | 7612 | 65 (14) | 11240 | 5196 | 6015 | 67 (14) | 9748 | 5545 | 16347 | 69 (13) | 13041 | 6384 | 13978 | 70 (12) |
| OLDW cohort 42 | 420302 | 18617 | 4958 | 2035 | 67 (12) | 7652 | 2438 | 969 | 71 (12) | 5920 | 2593 | 2880 | 72 (12) | 10806 | 3714 | 2893 | 73 (10) |
| OLDW cohort 43 | 68240 | 3249 | 1874 | 175 | 72 (12) | 1190 | 680 | 235 | 76 (11) | 1319 | 889 | 337 | 77 (12) | 1898 | 1273 | 352 | 77 (10) |
| OLDW cohort 44 | 199070 | 12892 | 5106 | 993 | 68 (13) | 4936 | 1668 | 927 | 71 (13) | 3108 | 1511 | 2522 | 73 (12) | 5673 | 2577 | 2161 | 73 (11) |
| OLDW cohort 45 | 3136664 | 471788 | 180594 | 36005 | 69 (13) | 189108 | 78693 | 45965 | 70 (13) | 138248 | 63995 | 118138 | 72 (12) | 140855 | 57484 | 101488 | 73 (11) |
| PSP-CKD | 26072 | 6002 | 1001 | 701 | 78 (10) | 3388 | 501 | 920 | 81 (9) | 1984 | 541 | 1159 | 82 (9) | NA | NA | NA | NA |
| RCAV | 2237948 | 567343 | 55573 | 17487 | 67 (11) | 53243 | 14172 | 19567 | 69 (11) | 156228 | 32697 | 76806 | 70 (11) | 118438 | 22297 | 54172 | 72 (10) |
| REGARDS | 28689 | NA | NA | 1726 | 74 (9) | 1773 | NA | 1379 | 75 (9) | NA | NA | NA | NA | NA | NA | NA | NA |
| RENAAL | 1510 | 242 | NA | 75 | 63 (6) | 130 | NA | 68 | 64 (7) | 81 | NA | 183 | 63 (7) | NA | NA | NA | NA |
| SCREAM | 696881 | 26988 | 4217 | 9152 | 76 (12) | 22275 | 3473 | 12746 | 78 (12) | 19680 | 3877 | 20379 | 81 (11) | 39197 | 6054 | 17212 | 78 (11) |
| SEED | 9512 | 607 | NA | 632 | 69 (11) | 238 | NA | 376 | 72 (10) | NA | NA | NA | NA | NA | NA | NA | NA |
| SHARP | 4790 | 166 | NA | 114 | 72 (11) | 354 | NA | 107 | 72 (11) | NA | NA | NA | NA | NA | NA | 95 | 72 (9) |
| SKS | 2395 | 372 | 2 | 40 | 69 (12) | 191 | 1 | 37 | 72 (12) | 410 | 3 | 14 | 78 (9) | NA | NA | NA | NA |
| SMART | 13010 | 5131 | NA | 250 | 67 (11) | 2499 | NA | 310 | 69 (10) | NA | NA | 96 | 73 (11) | 175 | NA | NA | NA |
| SRR-CKD | 2559 | 233 | NA | 147 | 75 (9) | 218 | NA | 103 | 77 (10) | 398 | NA | 348 | 77 (9) | NA | NA | NA | NA |
| Sunnybrook | 2524 | 156 | 38 | 85 | 76 (11) | 82 | 23 | 57 | 79 (11) | 186 | 52 | 178 | 78 (11) | NA | NA | NA | NA |
| UK Biobank | 463563 | 16240 | NA | 4347 | 65 (7) | 6776 | NA | 3712 | 67 (7) | 317 | NA | 1725 | 68 (6) | 7343 | NA | 5607 | 67 (7) |
| West of Scotland | 2412 | 368 | 29 | 104 | 74 (10) | 112 | 10 | 81 | 75 (10) | 95 | 13 | 101 | 74 (8) | 150 | 14 | 173 | 77 (8) |
| YWSCC | 869 | 222 | 8 | 17 | 74 (10) | 128 | 6 | 16 | 70 (16) | 138 | 12 | 20 | 73 (9) | 66 | 8 | 8 | 79 (4) |

Hx: history; Inc: incidence. Incidence was defined with free history unless information of history was not available.

₤ PCR was converted to ACR when ACR was not available in CanPREDDICT, CRIC, Geisinger, Hongkong CKD, LCC, MASTERPLAN, MDRD, MMKD, Mt Sinai BioMe, Nanjing CKD, Nefrona, NephroTest, OLDW all cohorts, PSP-CKD, SKS, Sunnybrook, YWSCC

€ Only statin use was available in ADVANCE, ARIC, CanPREDDICT, CRIB, LCC, Mt Sinai BioMe, NephroTest, PSP-CKD, REGARDS, SRR-CKD

**Table S4. Number of KFRT and KF events during follow-up within each cohort**

| Cohort | N | KFRT | | KFRT+eGFR<15 |
|---|---|---|---|---|
| | | n | Follow-up | n |
| Overall | 25,903,761 | 101,044 | 4.2 (2.9) | 221659 |
| ADVANCE | 11091 | 81 | 8.6 (2.9) | 127 |
| ARIC | 11527 | 243 | 21.2 (1.9) | NA |
| CanPREDDICT | 1894 | 375 | 3.5 (1.6) | 729 |
| CARE FOR HOMe | 541 | 67 | 4.7 (2.2) | 72 |
| CRIB | 264 | 90 | 5.3 (3.0) | NA |
| CRIC | 5494 | 1213 | 7.0 (4.4) | 1337 |
| GCKD | 5128 | 498 | 6.0 (1.8) | NA |
| Geisinger | 366016 | 1958 | 6.0 (3.6) | 5945 |
| GLOMMS | 329977 | 392 | 5.8 (3.0) | 2700 |
| Go-DARTs | 17821 | 171 | 14.5 (5.6) | 1297 |
| Gubbio | 4597 | 51 | 16.0 (4.1) | NA |
| Hongkong CKD | 245 | 125 | 5.8 (3.5) | NA |
| ICES-KDT | 1017530 | 6963 | 6.0 (1.9) | 19521 |
| LCC | 17132 | 123 | 4.0 (1.5) | NA |
| Maccabi | 1440372 | 1909 | 7.5 (3.4) | 6853 |
| MASTERPLAN | 650 | 116 | 5.9 (1.2) | 163 |
| MDRD | 1618 | 996 | 10.2 (7.1) | NA |
| MMKD | 172 | 45 | 4.4 (1.5) | NA |
| Mt Sinai BioMe | 17446 | 264 | 3.8 (2.3) | 487 |
| Nanjing CKD | 1275 | 733 | 4.4 (3.4) | 1028 |
| Nefrona | 1471 | 113 | 3.8 (1.1) | NA |
| NephroTest | 1757 | 354 | 5.6 (3.1) | NA |
| OLDW cohort 1 | 317354 | 1717 | 4.5 (2.5) | 2865 |
| OLDW cohort 2 | 88380 | 335 | 4.4 (2.8) | 784 |
| OLDW cohort 3 | 110002 | 231 | 2.9 (1.8) | 536 |
| OLDW cohort 4 | 304007 | 1604 | 3.2 (1.9) | 2938 |
| OLDW cohort 5 | 175556 | 679 | 3.7 (2.6) | 1622 |
| OLDW cohort 6 | 165729 | 738 | 3.1 (1.8) | 1690 |
| OLDW cohort 7 | 121413 | 226 | 3.3 (2.2) | 419 |
| OLDW cohort 8 | 266591 | 428 | 4.1 (2.5) | 914 |
| OLDW cohort 9 | 1473923 | 4717 | 3.8 (2.5) | 13055 |
| OLDW cohort 10 | 1305648 | 3688 | 4.3 (3.0) | 8393 |
| OLDW cohort 11 | 176874 | 508 | 2.7 (2.0) | 1375 |
| OLDW cohort 12 | 385105 | 666 | 2.5 (1.9) | 998 |
| OLDW cohort 13 | 849173 | 5713 | 3.5 (2.2) | 8798 |
| OLDW cohort 14 | 133785 | 1774 | 2.7 (2.3) | 2238 |
| OLDW cohort 15 | 81203 | 149 | 5.0 (3.1) | 408 |
| OLDW cohort 16 | 231809 | 1106 | 4.3 (2.4) | 2153 |
| OLDW cohort 17 | 153560 | 594 | 5.1 (3.1) | 1562 |
| OLDW cohort 18 | 278097 | 873 | 2.4 (1.7) | 1337 |
| OLDW cohort 19 | 308518 | 1202 | 3.6 (2.9) | 2907 |
| OLDW cohort 20 | 669837 | 2723 | 3.7 (2.4) | 5069 |
| OLDW cohort 21 | 181418 | 719 | 3.8 (2.6) | 1919 |
| OLDW cohort 22 | 836079 | 1967 | 2.7 (2.3) | 4133 |
| OLDW cohort 23 | 365414 | 882 | 4.2 (3.0) | 3452 |
| OLDW cohort 24 | 543380 | 1043 | 3.2 (2.0) | 4622 |
| OLDW cohort 25 | 537225 | 2914 | 4.2 (2.6) | 4868 |
| OLDW cohort 26 | 1141213 | 5789 | 4.2 (2.8) | 12052 |
| OLDW cohort 27 | 40674 | 170 | 2.7 (1.9) | 268 |

| | | | | |
|---|---|---|---|---|
| OLDW cohort 28 | 330566 | 2890 | 4.9 (3.1) | 5122 |
| OLDW cohort 29 | 747255 | 2077 | 4.5 (2.7) | 4904 |
| OLDW cohort 30 | 366530 | 1445 | 3.8 (2.6) | 2785 |
| OLDW cohort 31 | 363900 | 580 | 4.5 (2.8) | 2311 |
| OLDW cohort 32 | 216369 | 1501 | 2.8 (2.3) | 2168 |
| OLDW cohort 33 | 244814 | 606 | 2.8 (2.1) | 1094 |
| OLDW cohort 34 | 131205 | 376 | 4.6 (2.9) | 1058 |
| OLDW cohort 35 | 148535 | 1418 | 4.1 (3.0) | 1798 |
| OLDW cohort 36 | 175418 | 853 | 3.5 (2.6) | 1396 |
| OLDW cohort 37 | 367461 | 1132 | 4.2 (2.6) | 3528 |
| OLDW cohort 38 | 224879 | 1614 | 4.2 (2.9) | 3304 |
| OLDW cohort 39 | 51457 | 142 | 2.1 (1.2) | 273 |
| OLDW cohort 40 | 204235 | 505 | 5.4 (3.1) | 1527 |
| OLDW cohort 41 | 518142 | 1473 | 3.7 (2.6) | 3549 |
| OLDW cohort 42 | 420302 | 909 | 4.3 (3.0) | 2400 |
| OLDW cohort 43 | 68240 | 95 | 2.1 (1.5) | 188 |
| OLDW cohort 44 | 199070 | 286 | 3.2 (1.7) | 851 |
| OLDW cohort 45 | 3136664 | 14232 | 4.0 (2.9) | 28139 |
| PSP-CKD | 26072 | 137 | 3.8 (1.5) | 357 |
| RCAV | 2237948 | 4311 | 2.6 (1.1) | 16629 |
| REGARDS | 28689 | 590 | 11.4 (3.4) | NA |
| RENAAL | 1510 | 338 | 2.9 (0.9) | 533 |
| SCREAM | 696881 | 539 | 3.5 (1.2) | 1634 |
| SEED | 9512 | 139 | 10.1 (2.7) | 141 |
| SHARP | 4790 | 1058 | 4.0 (1.5) | 1840 |
| SKS | 2395 | 384 | 5.0 (3.5) | 897 |
| SMART | 13010 | 81 | 8.8 (5.4) | NA |
| SRR-CKD | 2559 | 522 | 2.9 (1.6) | NA |
| Sunnybrook | 2524 | 179 | 3.3 (2.1) | 293 |
| UK Biobank | 463563 | 362 | 8.1 (1.1) | NA |
| West of Scotland | 2412 | 158 | 7.0 (3.0) | 1168 |
| YWSCC | 869 | 77 | 2.7 (0.5) | 138 |

**Table S5. Unadjusted, minimally adjusted, and fully adjusted hazard ratios of kidney failure replacement therapy (KFRT) after different cardiovascular events, by prevalence and incidence (with baseline adjustment or time dependent covariates), modelled separately and simultaneously adjusted for each other, in the Optum Labs Data Warehouse (OLDW) cohorts**

| | **Cardiovascular event types modelled separately** | | | | **Cardiovascular event types adjusted for each other** | | | |
|---|---|---|---|---|---|---|---|---|
| **N = 19,150,075** | **CHD** | **Stroke** | **HF** | **Atrial fibrillation** | **CHD** | **Stroke** | **HF** | **Atrial fibrillation** |
| **Baseline covariates** | **HRs (95% CI) of KFRT after Baseline Prevalent CVD** | | | | **HRs (95% CI) of KFRT after Baseline Prevalent CVD** | | | |
| Unadjusted | **4.13 (3.84, 4.44)** | **3.41 (3.17, 3.67)** | **9.32 (8.49, 10.2)** | **3.13 (2.87, 3.42)** | **2.34 (2.20, 2.50)** | **1.90 (1.80, 2.00)** | **5.11 (4.79, 5.44)** | **1.08 (1.02, 1.15)** |
| Age and sex adjusted | **2.59 (2.47, 2.71)** | **2.22 (2.10, 2.35)** | **5.94 (5.60, 6.29)** | **1.78 (1.67, 1.89)** | **1.70 (1.63, 1.77)** | **1.64 (1.56, 1.71)** | **4.59 (4.36, 4.84)** | **0.87 (0.83, 0.91)** |
| Age, sex, eGFR, ACR, missing ACR adj. | **1.51, 1.44, 1.60)** | **1.37 (1.30, 1.45)** | **1.85 (1.74, 1.97)** | **1.20 (1.12, 1.28)** | **1.28 (1.23, 1.33)** | **1.19 (1.14, 1.24)** | **1.70 (1.62, 1.78)** | **0.91 (0.87, 0.96)** |
| Fully adjusted | **1.26 (1.21, 1.30)** | **1.16 (1.12, 1.20)** | **1.47 (1.40, 1.53)** | **1.14 (1.08, 1.20)** | **1.13 (1.10, 1.17)** | **1.09 (1.05, 1.13)** | **1.40 (1.35, 1.46)** | 0.99 (0.95, 1.04) |
| Fully adjusted in male | **1.22 (1.18, 1.27)** | **1.14 (1.09, 1.18)** | **1.44 (1.36, 1.52)** | **1.13 (1.06, 1.20)** | **1.11 (1.07, 1.15)** | **1.08 (1.03, 1.13)** | **1.38 (1.30, 1.45)** | 1.00 (0.94, 1.05) |
| Fully adjusted in female | **1.27 (1.22, 1.33)** | **1.20 (1.14, 1.27)** | **1.51 (1.42, 1.60)** | **1.18 (1.12, 1.24)** | **1.14 (1.09, 1.18)** | **1.12 (1.05, 1.19)** | **1.45 (1.38, 1.53)** | 0.99 (0.93, 1.06) |
| **Baseline covariates** | **HRs (95% CI) of KFRT after Incident CVD During Follow-up** | | | | **HRs (95% CI) of KFRT after Incident CVD During Follow-up** | | | |
| Unadjusted | **9.37 (8.64, 10.2)** | **5.81 (5.21, 6.47)** | **18.9 (17.0, 21.0)** | **7.96 (7.15, 8.86)** | **1.69 (1.57, 1.83)** | **1.99 (1.80, 2.19)** | **14.4 (12.9, 16.2)** | **1.26 (1.14, 1.40)** |
| Age and sex adjusted | **6.43 (6.00, 6.88)** | **3.87 (3.54, 4.24)** | **12.9 (11.9, 13.9)** | **4.81 (4.42, 5.23)** | **1.58 (1.47, 1.69)** | **1.74 (1.59, 1.91)** | **10.6 (9.68, 11.7)** | 1.00 (0.91, 1.10) |
| Age, sex, eGFR, ACR, missing ACR adj. | **3.77 (3.48, 4.08)** | **2.48 (2.28, 2.69)** | **5.10 (4.74, 5.49)** | **3.02 (2.79, 3.28)** | **1.55 (1.42, 1.69)** | **1.50 (1.37, 1.65)** | **4.12 (3.78, 4.49)** | **1.20 (1.09, 1.32)** |
| Fully adjusted | **3.37 (3.17, 3.59)** | **2.13 (1.96, 2.31)** | **4.47 (4.17, 4.80)** | **2.93 (2.70, 3.18)** | **1.50 (1.39, 1.61)** | **1.36 (1.25, 1.49)** | **3.57 (3.27, 3.89)** | **1.37 (1.24, 1.50)** |
| Fully adjusted in male | **3.27 (3.09, 3.47)** | **2.16 (1.96, 2.38)** | **4.33 (3.96, 4.74)** | **2.94 (2.70, 3.21)** | **1.52 (1.39, 1.67)** | **1.37 (1.21, 1.54)** | **3.46 (3.14, 3.82)** | **1.40 (1.27, 1.55)** |
| Fully adjusted in female | **3.62 (3.34, 3.93)** | **2.16 (1.96, 2.39)** | **4.77 (4.45, 5.11)** | **2.96 (2.71, 3.23)** | **1.53 (1.37, 1.71)** | **1.40 (1.22, 1.61)** | **3.91 (3.55, 4.31)** | **1.30 (1.16, 1.46)** |
| **Time dependent covariates** | **HRs (95% CI) of KFRT after Incident CVD During Follow-up** | | | | **HRs (95% CI) of KFRT after Incident CVD During Follow-up** | | | |
| Unadjusted | **9.37 (8.64, 10.2)** | **5.81 (5.21, 6.47)** | **18.9 (17.0, 21.0)** | **7.96 (7.15, 8.86)** | **1.69 (1.57, 1.83)** | **1.99 (1.80, 2.19)** | **14.4 (12.9, 16.2)** | **1.26 (1.14, 1.40)** |
| Age and sex adjusted | **5.93 (5.53, 6.36)** | **3.57 (3.26, 3.91)** | **12.2 (11.3, 13.1)** | **4.48 (4.12, 4.87)** | **1.55 (1.44, 1.66)** | **1.69 (1.54, 1.85)** | **10.0 (9.14, 11.0)** | 0.98 (0.89, 1.07) |
| Age, sex, eGFR, ACR, missing ACR adj. | **1.65 (1.51, 1.80)** | **1.28 (1.15, 1.43)** | **2.39 (2.16, 2.64)** | **1.63 (1.47, 1.81)** | **1.14 (1.05, 1.23)** | **1.12 (1.03, 1.21)** | **1.90 (1.72, 2.11)** | 1.08 (0.99, 1.18) |
| Fully adjusted | **1.60 (1.43, 1.79)** | **1.20 (1.05, 1.37)** | **2.15 (1.92, 2.42)** | **1.59 (1.41, 1.81)** | **1.09 (1.01, 1.15)** | 1.00 (0.91, 1.10) | **1.58 (1.43, 1.76)** | **1.15 (1.06, 1.25)** |
| Fully adjusted in male | **1.72 (1.54, 1.92)** | **1.16 (1.01, 1.32)** | **2.12 (1.83, 2.45)** | **1.57 (1.35, 1.82)** | **1.13 (1.03, 1.14)** | 0.99 (0.87, 1.14) | **1.54 (1.36, 1.75)** | **1.16 (1.06, 1.25)** |
| Fully adjusted in female | **1.51 (1.26, 1.81)** | **1.36 (1.10, 1.69)** | **2.28 (2.04, 2.55)** | **1.72 (1.49, 1.97)** | 1.06 (0.94, 1.20) | 1.05 (0.93, 1.18) | **1.65 (1.50, 1.82)** | **1.19 (1.07, 1.33)** |

ACR: urine albumin-to-creatinine ratio; CHD: coronary heart disease; CVD: cardiovascular disease; eGFR: estimated glomerular filtration rate; HF: heart failure; KFRT: kidney failure replacement therapy

Fully adjusted model includes age, sex, black race, eGFR, smoking status, diabetes mellitus, systolic blood pressure and antihypertensive medication use, total cholesterol, HDL cholesterol and use of lipid lowering medication use, body mass, missing indicator of ACR and log-transformed ACR.

**Table S6. Adjusted hazard ratios of kidney failure replacement therapy (KFRT) associated with incidence of different cardiovascular events, adjusting for most recent eGFR with shorter follow-up, in Optum Labs Data Warehouse (OLDW) cohorts, N = 19,157,009**

| **First incident event of each CVD subtype in separate models, regardless of the other three CVD types** | | **Coronary Heart Disease** | **Stroke** | **Heart Failure** | **Atrial fibrillation** |
|---|---|---|---|---|---|
| | | **KFRT** | | | |
| Adjusted for baseline eGFR | Incident < 3 month | **79.33 (73.86, 85.20)** | **44.90 (41.11, 49.04)** | **106.06 (101.91, 110.38)** | **78.35 (74.68, 82.20)** |
| | Incident 4 - 6 month | **15.14 (13.41, 17.10)** | **10.27 (8.82, 11.95)** | **24.07 (22.68, 25.54)** | **14.91 (13.69, 16.23)** |
| | Incident 7 - 9 month | **7.90 (6.80, 9.19)** | **6.38 (5.44, 7.47)** | **14.02 (13.11, 15.00)** | **8.99 (8.16, 9.91)** |
| | Incident 10 - 12 month | **7.78 (6.71, 9.03)** | **4.05 (3.41, 4.81)** | **9.70 (9.01, 10.45)** | **6.49 (5.83, 7.21)** |
| | Incident 13 - 15 month | **5.66 (4.82, 6.64)** | **4.62 (3.91, 5.45)** | **8.41 (7.79, 9.08)** | **5.05 (4.51, 5.66)** |
| | Incident 16 - 18 month | **3.82 (3.22, 4.53)** | **3.19 (2.65, 3.83)** | **5.57 (5.10, 6.08)** | **3.45 (3.03, 3.94)** |
| | Incident 19 - 21 month | **3.35 (2.74, 4.09)** | **2.69 (2.21, 3.27)** | **4.98 (4.55, 5.45)** | **3.06 (2.68, 3.50)** |
| | Incident 22 - 24 month | **2.66 (2.16, 3.28)** | **2.18 (1.76, 2.71)** | **3.99 (3.62, 4.40)** | **2.72 (2.36, 3.12)** |
| | Incident 25 - 27 month | **2.48 (1.99, 3.08)** | **1.94 (1.56, 2.42)** | **3.53 (3.19, 3.91)** | **2.06 (1.76, 2.41)** |
| | Incident 28 - 30 month | **2.16 (1.70, 2.74)** | **1.97 (1.58, 2.47)** | **2.85 (2.55, 3.19)** | **1.92 (1.65, 2.25)** |
| | Incident 31 - 33 month | **1.52 (1.16, 1.99)** | **1.92 (1.56, 2.35)** | **2.50 (2.22, 2.81)** | **1.62 (1.37, 1.92)** |
| | Incident 34 - 36 month | **2.13 (1.67, 2.72)** | **1.44 (1.12, 1.85)** | **2.33 (2.05, 2.63)** | **1.48 (1.24, 1.77)** |
| | Incident 3y+ | **0.61 (0.54, 0.69)** | **0.54 (0.48, 0.61)** | **0.94 (0.88, 0.99)** | **0.58 (0.53, 0.63)** |
| **First incident event of each CVD subtype in one model, adjusted for the other three CVD types** | | **Coronary Heart Disease** | **Stroke** | **Heart Failure** | **Atrial fibrillation** |
| | | **KFRT** | | | |
| Adjusted for baseline eGFR | Incident < 3 month | **2.13 (1.94, 2.34)** | **2.46 (2.18, 2.78)** | **46.45 (43.21, 49.94)** | **3.61 (3.31, 3.93)** |
| | Incident 4 - 6 month | **1.64 (1.41, 1.91)** | **1.76 (1.43, 2.16)** | **15.53 (14.20, 16.99)** | **1.94 (1.71, 2.21)** |
| | Incident 7 - 9 month | **1.25 (1.04, 1.51)** | **1.91 (1.56, 2.35)** | **9.40 (8.50, 10.40)** | **1.85 (1.60, 2.15)** |
| | Incident 10 - 12 month | **1.77 (1.49, 2.12)** | **1.74 (1.40, 2.17)** | **7.07 (6.35, 7.88)** | **1.46 (1.24, 1.72)** |
| | Incident 13 - 15 month | **1.56 (1.29, 1.89)** | **1.56 (1.26, 1.94)** | **6.64 (5.97, 7.39)** | **1.23 (1.03, 1.46)** |
| | Incident 16 - 18 month | **1.30 (1.06, 1.60)** | **1.59 (1.25, 2.04)** | **4.41 (3.88, 5.01)** | **1.24 (1.03, 1.51)** |
| | Incident 19 - 21 month | **1.42 (1.13, 1.78)** | **1.88 (1.47, 2.40)** | **3.97 (3.49, 4.52)** | 1.20 (0.98, 1.46) |
| | Incident 22 - 24 month | 1.18 (0.93, 1.51) | **1.61 (1.24, 2.08)** | **3.65 (3.20, 4.18)** | 0.98 (0.80, 1.22) |

| | | | | | |
|---|---|---|---|---|---|
| | Incident 25 - 27 month | 1.29 (0.99, 1.68) | **1.50 (1.15, 1.95)** | **3.07 (2.66, 3.54)** | 0.98 (0.78, 1.22) |
| | Incident 28 - 30 month | 1.26 (0.96, 1.66) | **1.57 (1.19, 2.08)** | **2.64 (2.27, 3.07)** | 1.09 (0.88, 1.37) |
| | Incident 31 - 33 month | 1.03 (0.76, 1.38) | **1.55 (1.19, 2.02)** | **2.15 (1.82, 2.53)** | 1.04 (0.82, 1.31) |
| | Incident 34 - 36 month | 1.29 (0.96, 1.73) | 1.10 (0.80, 1.51) | **2.14 (1.80, 2.54)** | 0.90 (0.70, 1.17) |
| | Incident 3y+ | **0.67 (0.58, 0.77)** | **0.58 (0.50, 0.68)** | 0.97 (0.90, 1.04) | **0.56 (0.50, 0.62)** |

**Table S7. Adjusted hazard ratios of kidney failure replacement therapy (KFRT) associated with incidence of different cardiovascular events, adjusting for most recent eGFR with shorter follow-up and interaction analyses**

| | **Myocardial Infarction** | **Stroke** | **Heart Failure** | **Atrial fibrillation** |
|---|---|---|---|---|
| N overall | 25,902,290 | 25,902,290 | 25,858,471 | 24,353,175 |
| KFRT events overall | 100,931 | 100,931 | 98,001 | 93,600 |
| | | | | |
| Incident CVD event, N | 269,142 | 311,021 | 712,556 | 605,596 |
| Adjusted for most recent eGFR – KFRT events within shorter windows after CVD event | | | | |
| Incident overall | 1.55 (1.39, 1.73) | 1.03 (0.79, 1.34) | 2.03 (1.62, 2.53) | 1.37 (1.05, 1.77) |
| Incident overall† | 1.73 (1.48, 2.03) | 1.02 (0.72, 1.44) | 1.81 (1.41, 2.33) | 1.44 (1.06, 1.96) |
| Incident < 1y | 7.91 (6.35, 9.86) | 4.49 (3.43, 5.89) | 10.15 (7.95, 12.96) | 7.52 (5.62, 10.06) |
| Incident 1-2y | 1.63 (1.30, 2.05) | 1.40 (1.07, 1.84) | 2.37 (1.89, 2.98) | 1.57 (1.21, 2.03) |
| Incident 2y+ | 0.56 (0.49, 0.64) | 0.52 (0.39, 0.70) | 0.71 (0.57, 0.88) | 0.44 (0.34, 0.57) |
| Incident < 30d | 86.12 (69.87, 106.16) | 49.49 (37.95, 64.55) | 120.27 (95.05, 152.18) | 86.00 (67.49, 109.58) |
| Incident 30d-1y | 4.03 (3.39, 4.80) | 2.69 (2.19, 3.30) | 6.58 (5.14, 8.41) | 3.90 (3.07, 4.95) |
| Incident 1-2y | 1.45 (1.20, 1.75) | 1.26 (1.07, 1.49) | 2.33 (1.85, 2.92) | 1.41 (1.12, 1.77) |
| Incident 2y+ | 0.54 (0.47, 0.62) | 0.47 (0.39, 0.55) | 0.71 (0.57, 0.87) | 0.42 (0.32, 0.54) |
| Incident < 90d | 37.56 (28.61, 49.31) | 20.51 (14.34, 29.32) | 42.67 (33.77, 53.91) | 33.05 (24.82, 44.02) |
| Incident 90d-1y | 3.85 (3.03, 4.90) | 2.59 (1.89, 3.53) | 5.50 (4.27, 7.08) | 3.54 (2.60, 4.83) |
| Incident 1-2y | 1.66 (1.32, 2.08) | 1.54 (1.11, 2.12) | 2.39 (1.90, 3.01) | 1.58 (1.23, 2.02) |
| Incident 2y+ | 0.55 (0.48, 0.63) | 0.51 (0.38, 0.70) | 0.72 (0.58, 0.89) | 0.43 (0.33, 0.56) |
| Adjusted for most recent eGFR -- interaction model | | | | |
| Incident overall at eGFR 60 ACR 10 | 2.86 (2.41, 3.39) | 1.93 (1.60, 2.33) | 4.98 (4.30, 5.77) | 3.01 (2.59, 3.50) |
| Incident overall * eGFR <60 /-15ml | 0.80 (0.74, 0.86) | 0.76 (0.70, 0.82) | 0.71 (0.66, 0.76) | 0.77 (0.73, 0.82) |
| Incident overall * eGFR 60+ /-15ml | 0.71 (0.65, 0.77) | 0.62 (0.57, 0.67) | 0.61 (0.57, 0.65) | 0.62 (0.58, 0.66) |
| Incident overall * logACR /8 fold | 0.82 (0.78, 0.87) | 0.96 (0.90, 1.01) | 0.82 (0.78, 0.86) | 0.81 (0.76, 0.86) |

† Incident free of history of all 4 subtypes. eGFR updated to the most recent value prior to the onset of CVD.

**Table S8. Adjusted hazard ratios of kidney failure replacement therapy (KFRT) associated with incidence of different cardiovascular events, adjusting for baseline eGFR with shorter follow-up and interaction analyses**

| | **Myocardial Infarction** | **Stroke** | **Heart Failure** | **Atrial fibrillation** |
|---|---|---|---|---|
| N overall | 25,902,290 | 25,902,290 | 25,858,471 | 24,353,175 |
| KFRT events overall | 100,931 | 100,931 | 98,001 | 93,600 |
| | | | | |
| Incident CVD event, N | 269,142 | 311,021 | 712,556 | 605,596 |
| Adjusted for baseline eGFR – KFRT events within shorter windows after CVD event | | | | |
| Incident < 30d | 268.16 (228.79, 314.31) | 137.07 (109.12, 172.17) | 361.39 (311.57, 419.16) | 262.87 (223.84, 308.70) |
| Incident 30d-1y | 13.46 (12.11, 14.96) | 7.77 (6.88, 8.77) | 18.59 (15.93, 21.68) | 11.72 (10.56, 13.02) |
| Incident 1-2y | 3.52 (3.02, 4.11) | 2.99 (2.61, 3.42) | 5.39 (4.74, 6.13) | 3.41 (3.10, 3.76) |
| Incident 2y+ | 0.95 (0.88, 1.03) | 0.79 (0.71, 0.88) | 1.26 (1.16, 1.38) | 0.85 (0.78, 0.93) |
| Incident < 90d | 106.32 (91.22, 123.91) | 51.17 (42.48, 61.65) | 122.83 (106.58, 141.57) | 94.55 (78.99, 113.17) |
| Incident 90d-1y | 11.67 (10.07, 13.53) | 6.70 (5.91, 7.59) | 15.21 (13.11, 17.65) | 10.50 (9.02, 12.23) |
| Incident 1-2y | 3.84 (3.29, 4.47) | 3.28 (2.85, 3.78) | 5.47 (4.81, 6.21) | 3.76 (3.29, 4.29) |
| Incident 2y+ | 0.94 (0.86, 1.04) | 0.81 (0.74, 0.90) | 1.28 (1.18, 1.40) | 0.86 (0.79, 0.94) |
| Adjusted for baseline eGFR -- interaction model | | | | |
| Incident overall at eGFR 60 ACR 10 | 4.86 (4.31, 5.49) | 2.81 (2.41, 3.26) | 9.74 (8.72, 10.88) | 4.89 (4.32, 5.53) |
| Incident overall * eGFR <60 /-15ml | 0.69 (0.64, 0.74) | 0.71 (0.65, 0.78) | 0.58 (0.55, 0.61) | 0.66 (0.62, 0.70) |
| Incident overall * eGFR 60+ /-15ml | 0.69 (0.65, 0.74) | 0.63 (0.58, 0.67) | 0.62 (0.59, 0.66) | 0.66 (0.62, 0.70) |
| Incident overall * logACR /8 fold | 0.97 (0.93, 1.02) | 1.08 (1.02, 1.14) | 0.91 (0.87, 0.96) | 0.93 (0.88, 0.98) |
| Incident < 1y at eGFR 60 ACR 10 | 65.73 (54.31, 79.54) | 26.92 (21.82, 33.22) | 96.32 (82.17, 112.92) | 54.73 (44.65, 67.08) |
| Incident 1-2y at eGFR 60 ACR 10 | 8.45 (3.95, 18.05) | 2.02 (0.47, 8.67) | 15.88 (13.55, 18.62) | 6.32 (4.61, 8.66) |
| Incident 2y+ at eGFR 60 ACR 10 | 1.67 (1.39, 2.01) | 1.51 (1.22, 1.89) | 3.21 (2.80, 3.69) | 1.59 (1.36, 1.86) |
| Incident < 1y * eGFR <60 /-15ml | 0.54 (0.50, 0.59) | 0.57 (0.51, 0.63) | 0.48 (0.46, 0.51) | 0.51 (0.47, 0.55) |
| Incident 1-2y * eGFR <60 /-15ml | 0.61 (0.27, 1.40) | 1.08 (0.48, 2.46) | 0.51 (0.48, 0.54) | 0.66 (0.56, 0.77) |
| Incident 2y+ * eGFR <60 /-15ml | 0.63 (0.57, 0.71) | 0.60 (0.53, 0.67) | 0.51 (0.47, 0.56) | 0.60 (0.55, 0.66) |
| Incident < 1y * eGFR 60+ /-15ml | 0.65 (0.60, 0.72) | 0.55 (0.50, 0.61) | 0.58 (0.55, 0.61) | 0.62 (0.57, 0.66) |

| | | | | |
|---|---|---|---|---|
| Incident 1-2y * eGFR 60+ /-15ml | 0.63 (0.41, 0.97) | 0.47 (0.26, 0.83) | 0.62 (0.57, 0.68) | 0.62 (0.54, 0.72) |
| Incident 2y+ * eGFR 60+ /-15ml | 0.78 (0.70, 0.87) | 0.69 (0.62, 0.77) | 0.69 (0.64, 0.73) | 0.73 (0.66, 0.82) |
| Incident < 1y * logACR /8 fold | 0.81 (0.75, 0.87) | 0.96 (0.87, 1.06) | 0.80 (0.76, 0.85) | 0.85 (0.79, 0.90) |
| Incident 1-2y * logACR /8 fold | 0.90 (0.62, 1.31) | 2.13 (0.94, 4.85) | 0.88 (0.84, 0.93) | 0.93 (0.84, 1.02) |
| Incident 2y+ * logACR /8 fold | 1.06 (0.97, 1.16) | 1.16 (1.05, 1.29) | 0.96 (0.91, 1.02) | 1.08 (0.99, 1.18) |

**Table S9. Adjusted hazard ratios of kidney failure replacement therapy (KFRT) or eGFR <15 associated with prevalence and incidence of different cardiovascular events considered separately**

| | **Myocardial Infarction** | **Stroke** | **Heart Failure** | **Atrial fibrillation** |
|---|---|---|---|---|
| N overall | **25,352,029** | **25,352,029** | **25,337,727** | **23,836,747** |
| KFRT events overall | **221,659** | **221,659** | **219,678** | **209,979** |
| | | | | |
| Prevalent CVD event, N | **2,422,325** | **810,462** | **844,456** | **1,061,774** |
| Prevalent overall | 1.13 (1.10, 1.17) | 1.12 (1.09, 1.16) | 1.39 (1.33, 1.46) | 1.12 (1.08, 1.16) |
| | | | | |
| Incident CVD events, N | **261,191** | **303,657** | **708,129** | **597,382** |
| Incident overall | 3.53 (3.24, 3.86) | 2.55 (2.40, 2.71) | 5.11 (4.79, 5.44) | 3.70 (3.47, 3.95) |
| Incident overall† | 4.03 (3.74, 4.33) | 2.83 (2.65, 3.03) | 5.86 (5.54, 6.20) | 3.93 (3.69, 4.18) |
| Incident < 1y | 12.63 (10.94, 14.58) | 9.63 (8.63, 10.74) | 17.24 (15.25, 19.48) | 14.26 (13.02, 15.61) |
| Incident 1-2y | 3.39 (3.10, 3.71) | 2.59 (2.34, 2.86) | 4.39 (4.01, 4.81) | 3.01 (2.78, 3.26) |
| Incident 2y+ | 0.96 (0.89, 1.02) | 0.79 (0.73, 0.85) | 1.26 (1.17, 1.36) | 0.88 (0.83, 0.94) |
| Incident < 30d | 16.52 (13.01, 20.97) | 12.82 (10.59, 15.52) | 21.31 (17.80, 25.51) | 19.97 (16.84, 23.68) |
| Incident 30d-1y | 11.37 (10.25, 12.62) | 8.00 (7.29, 8.79) | 15.06 (13.67, 16.60) | 10.86 (10.03, 11.75) |
| Incident 1-2y | 3.39 (3.11, 3.70) | 2.59 (2.34, 2.87) | 4.32 (3.95, 4.73) | 2.99 (2.77, 3.22) |
| Incident 2y+ | 0.96 (0.90, 1.03) | 0.78 (0.72, 0.84) | 1.24 (1.14, 1.33) | 0.87 (0.82, 0.93) |
| Incident < 90d | 16.99 (13.65, 21.16) | 13.53 (11.41, 16.04) | 22.87 (19.33, 27.05) | 20.14 (17.54, 23.13) |
| Incident 90d-1y | 8.96 (8.11, 9.89) | 6.33 (5.77, 6.94) | 11.72 (10.64, 12.91) | 8.44 (7.78, 9.15) |
| Incident 1-2y | 3.41 (3.13, 3.72) | 2.57 (2.31, 2.86) | 4.32 (3.95, 4.73) | 3.00 (2.77, 3.24) |
| Incident 2y+ | 0.95 (0.89, 1.02) | 0.78 (0.72, 0.84) | 1.23 (1.14, 1.33) | 0.87 (0.82, 0.93) |

† Incident free of history of all 4 subtypes. Adjusted for baseline eGFR.

**Table S10. Absolute 2-year risk of death after incident CVD in the Optum Labs Data Warehouse (OLDW) by eGFR and ACR category**

| | eGFR | Regardless of ACR | | | | ACR <30 or missing | | | | ACR 30-299 | | | | ACR 300+ | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MI | Stroke | HF | Afib | MI | Stroke | HF | Afib | MI | Stroke | HF | Afib | MI | Stroke | HF | Afib |
| N | 90+ | 45609 | 48397 | 88507 | 77038 | 42767 | 45313 | 82029 | 50390 | 2104 | 2297 | 4559 | 3402 | 738 | 787 | 1919 | 791 |
| | 60-89 | 82966 | 99212 | 215338 | 211302 | 77830 | 92808 | 200269 | 160355 | 3636 | 4655 | 10784 | 11327 | 1500 | 1749 | 4285 | 2442 |
| | 45-59 | 32789 | 41675 | 111743 | 96564 | 29735 | 37936 | 101483 | 79123 | 2059 | 2575 | 6863 | 6956 | 995 | 1164 | 3397 | 1879 |
| | 30-44 | 21201 | 24691 | 80702 | 62272 | 18286 | 21450 | 69905 | 50666 | 1824 | 2046 | 6737 | 5897 | 1091 | 1195 | 4060 | 1995 |
| | 15-29 | 10190 | 9570 | 39442 | 27253 | 7977 | 7614 | 31274 | 20076 | 1010 | 950 | 3834 | 2997 | 1203 | 1006 | 4334 | 1746 |
| Age and sex adjusted risk of death without KFRT | 90+ | 28.1% | 30.0% | 33.8% | 30.3% | 28.0% | 29.9% | 33.9% | 30.1% | 26.8% | 29.3% | 32.4% | 33.4% | 37.8% | 33.6% | 36.3% | 39.9% |
| | 60-89 | 21.8% | 23.8% | 26.6% | 21.6% | 21.3% | 23.4% | 26.3% | 21.1% | 26.7% | 26.7% | 29.3% | 27.3% | 32.6% | 34.7% | 33.8% | 32.2% |
| | 45-59 | 27.7% | 28.3% | 29.2% | 26.6% | 27.1% | 27.8% | 28.9% | 26.1% | 30.9% | 29.9% | 29.5% | 27.9% | 34.5% | 36.0% | 35.4% | 36.9% |
| | 30-44 | 36.6% | 36.3% | 35.0% | 35.7% | 36.4% | 36.5% | 35.0% | 35.5% | 35.3% | 34.3% | 33.5% | 33.9% | 42.0% | 37.8% | 37.6% | 42.5% |
| | 15-29 | 47.8% | 47.7% | 42.9% | 48.1% | 48.8% | 48.5% | 43.5% | 48.5% | 46.5% | 43.5% | 42.3% | 47.2% | 45.1% | 46.9% | 41.2% | 47.2% |

Risk of death is age and sex adjusted to age 70 and half male to allow comparisons across the CVD subtypes

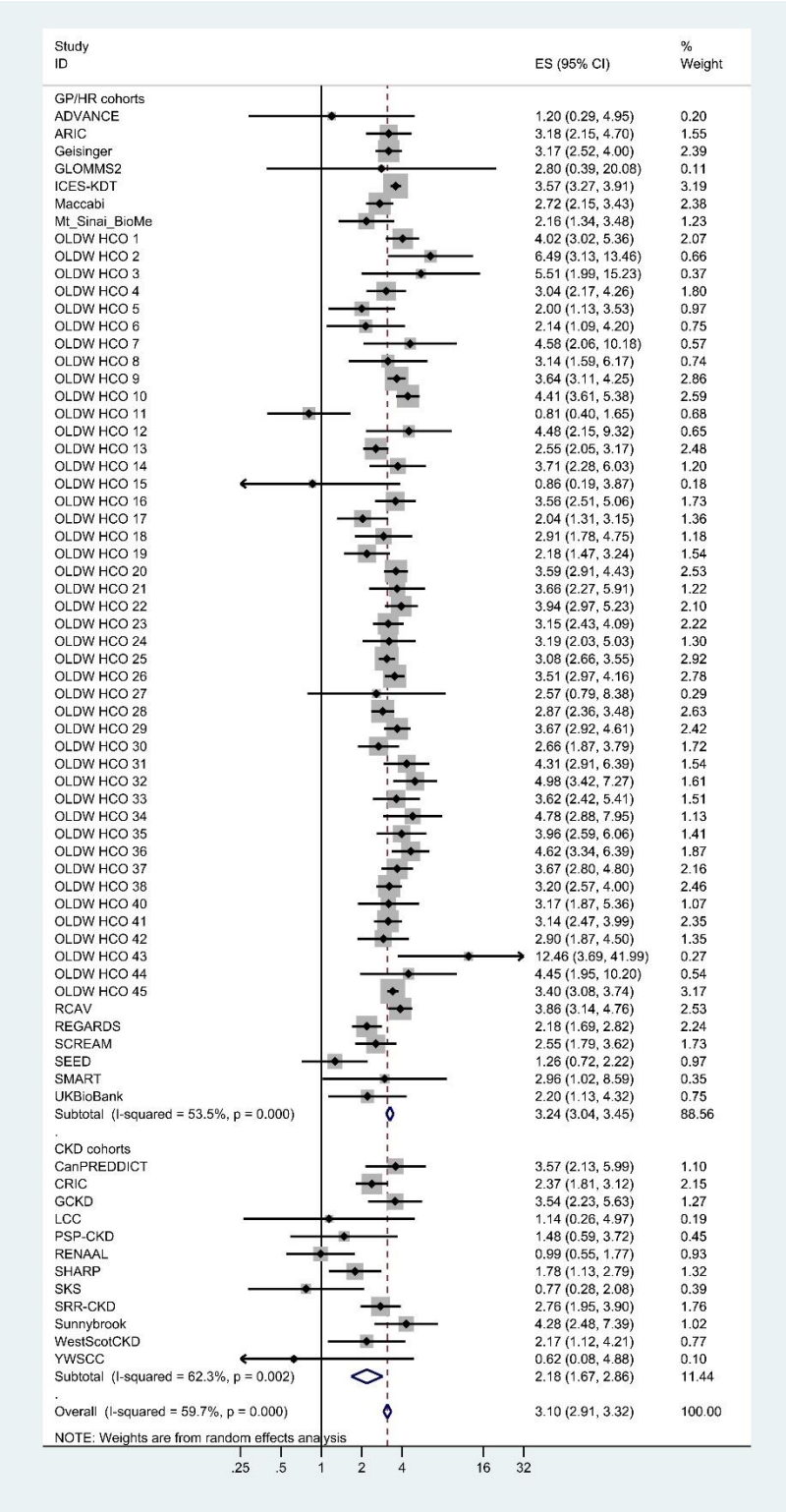
**Table S11. Absolute 2-year risk of KFRT, death, and KFRT with a competing risk of death after incident CVD in the Optum Labs Data Warehouse (OLDW) by eGFR and ACR category in those with eGFR 60+ with differing risk factors**

| **eGFR 60+** | | MI | Stroke | HF | Afib |
|---|---|---|---|---|---|
| N | No DM, Age <65 | 41541 | 41152 | 62771 | 62587 |
| | No DM, Age 65+ | 40420 | 52692 | 116039 | 128108 |
| | DM, Age <65 | 23256 | 23030 | 49547 | 32271 |
| | DM, Age 65+ | 23358 | 30735 | 75488 | 65374 |
| Unadjusted risk of KFRT | No DM, Age <65 | 0.2% | 0.2% | 0.5% | 0.3% |
| | No DM, Age 65+ | 0.1% | 0.1% | 0.2% | 0.2% |
| | DM, Age <65 | 0.9% | 0.8% | 1.5% | 0.8% |
| | DM, Age 65+ | 0.5% | 0.3% | 0.4% | 0.4% |
| Unadjusted risk of death without KFRT | No DM, Age <65 | 11.1% | 15.6% | 17.8% | 14.0% |
| | No DM, Age 65+ | 30.8% | 32.4% | 37.6% | 30.9% |
| | DM, Age <65 | 14.0% | 16.4% | 18.1% | 18.1% |
| | DM, Age 65+ | 33.2% | 32.9% | 35.6% | 33.6% |
| Unadjusted risk of KFRT accounting for death as a competing risk | No DM, Age <65 | 0.2% | 0.2% | 0.5% | 0.3% |
| | No DM, Age 65+ | 0.1% | 0.1% | 0.2% | 0.2% |
| | DM, Age <65 | 0.8% | 0.7% | 1.3% | 0.7% |
| | DM, Age 65+ | 0.4% | 0.2% | 0.4% | 0.3% |

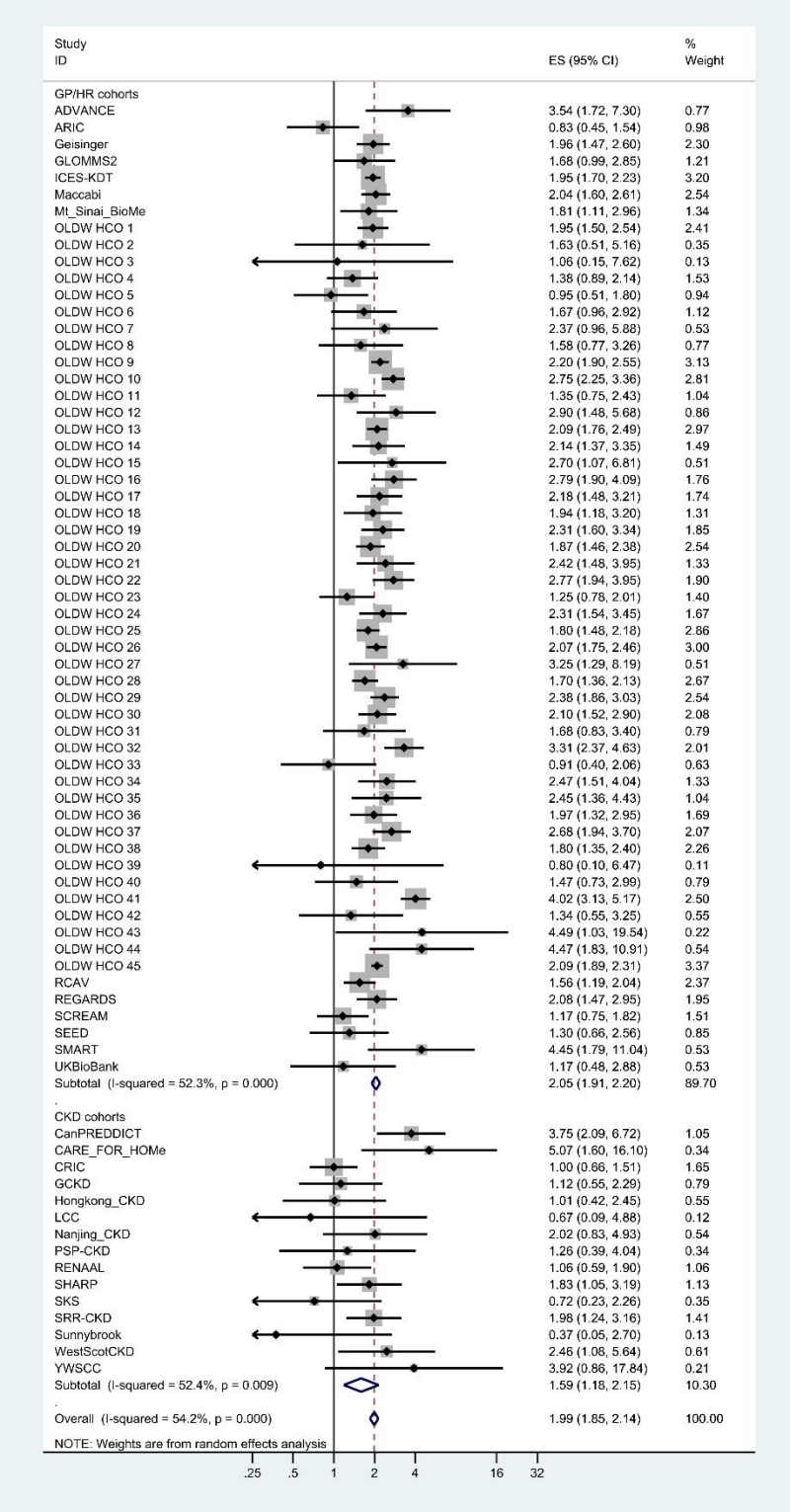
DM: diabetes mellitus

**Figure S1. Forest plots of the adjusted hazard ratios of kidney failure replacement therapy (KFRT) associated with incidence of different cardiovascular events within each cohort**

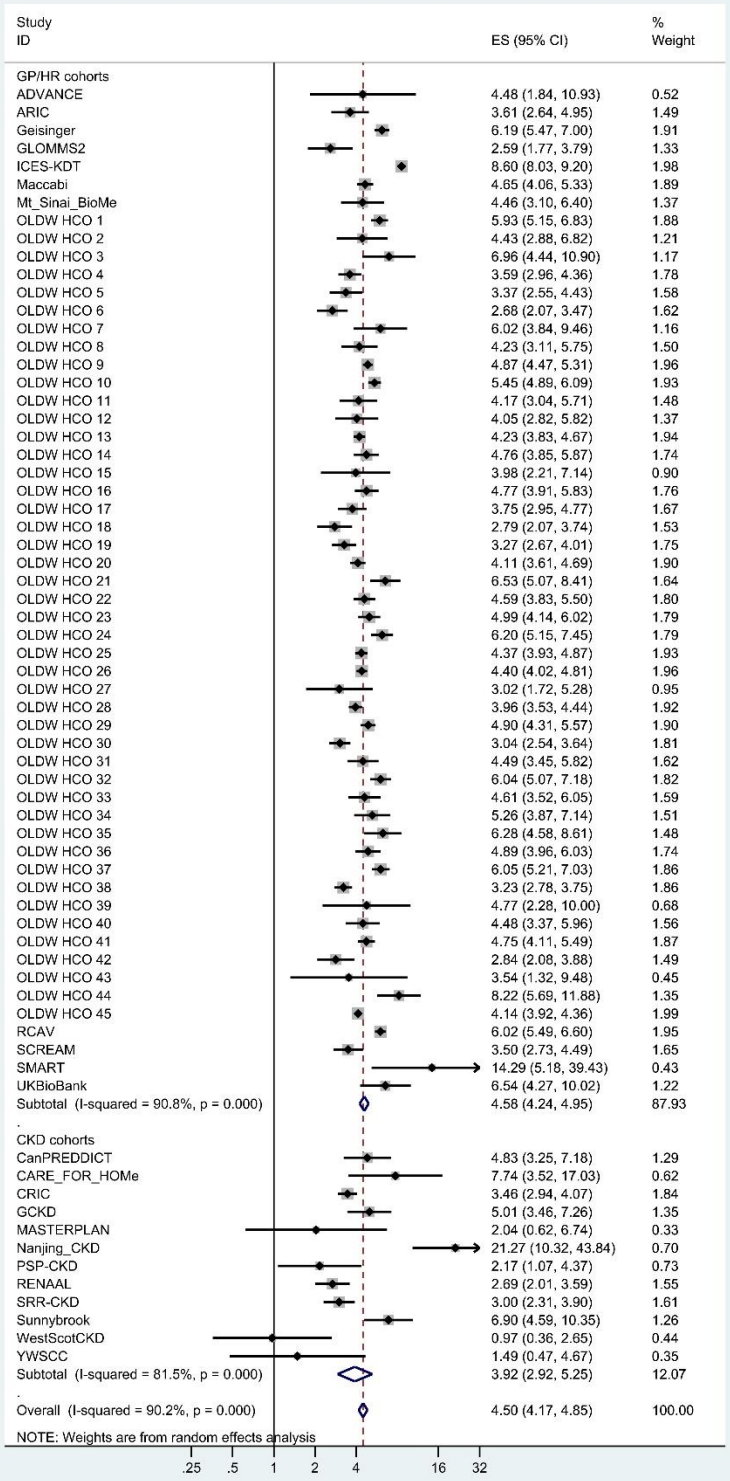
A. Myocardial infarction



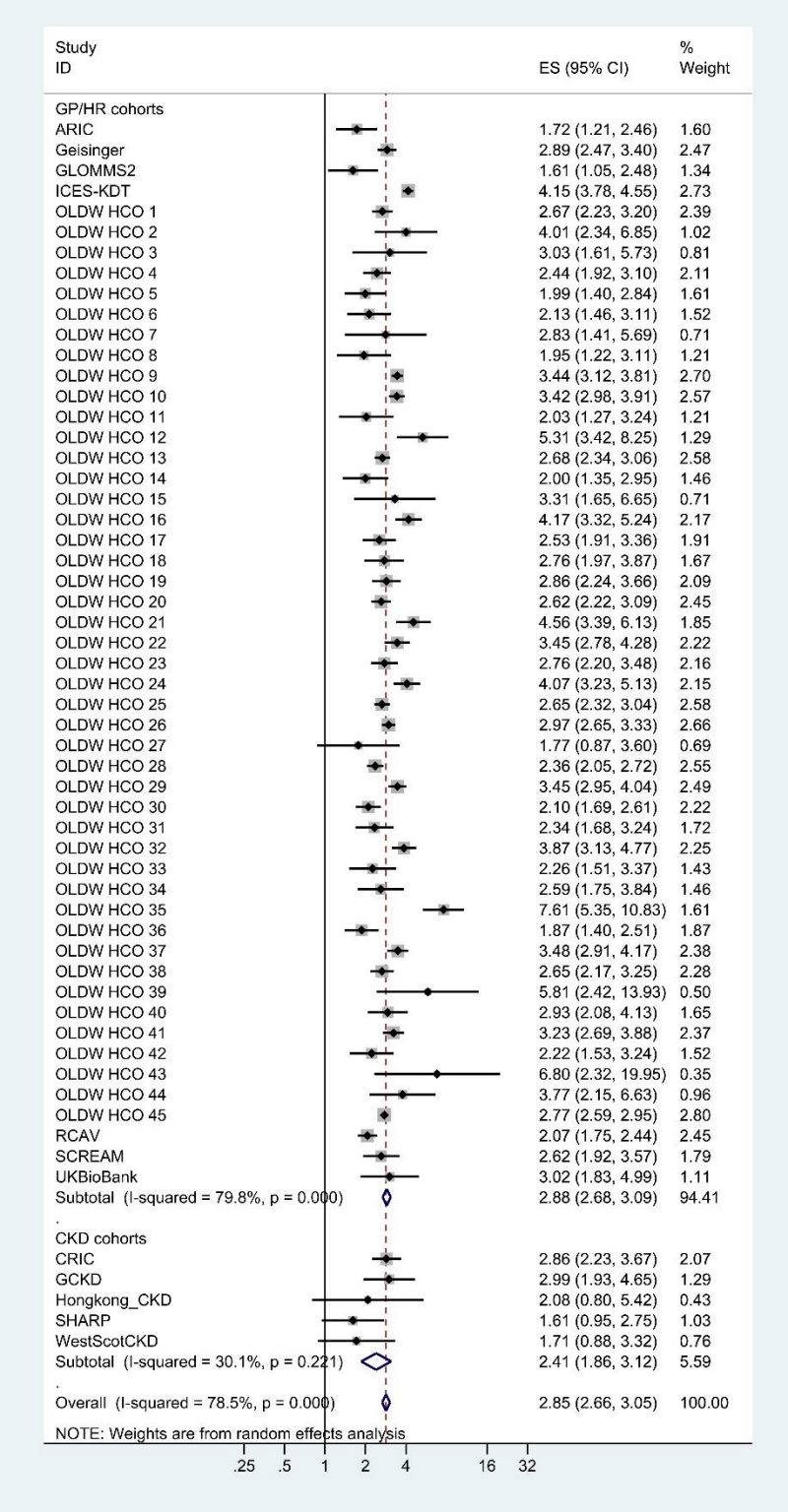
B. Stroke


Study ID
ES (95% CI)
% Weight
GP/HR cohorts
ADVANCE 3.54 (1.72, 7.30) 0.77
ARIC 0.83 (0.45, 1.54) 0.98
Geisinger 1.96 (1.47, 2.60) 2.30
GLOMMS2 1.68 (0.99, 2.85) 1.21
ICES-KDT 1.95 (1.70, 2.23) 3.20
Maccabi 2.04 (1.60, 2.61) 2.54
Mt_Sinai_BioMe 1.81 (1.11, 2.96) 1.34
OLDW HCO 1 1.95 (1.50, 2.54) 2.41
OLDW HCO 2 1.63 (0.51, 5.16) 0.35
OLDW HCO 3 1.06 (0.15, 7.62) 0.13
OLDW HCO 4 1.38 (0.89, 2.14) 1.53
OLDW HCO 5 0.95 (0.51, 1.80) 0.94
OLDW HCO 6 1.67 (0.96, 2.92) 1.12
OLDW HCO 7 2.37 (0.96, 5.88) 0.53
OLDW HCO 8 1.58 (0.77, 3.26) 0.77
OLDW HCO 9 2.20 (1.90, 2.55) 3.13
OLDW HCO 10 2.75 (2.25, 3.36) 2.81
OLDW HCO 11 1.35 (0.75, 2.43) 1.04
OLDW HCO 12 2.90 (1.48, 5.68) 0.86
OLDW HCO 13 2.09 (1.76, 2.49) 2.97
OLDW HCO 14 2.14 (1.37, 3.35) 1.49
OLDW HCO 15 2.70 (1.07, 6.81) 0.51
OLDW HCO 16 2.79 (1.90, 4.09) 1.76
OLDW HCO 17 2.18 (1.48, 3.21) 1.74
OLDW HCO 18 1.94 (1.18, 3.20) 1.31
OLDW HCO 19 2.31 (1.60, 3.34) 1.85
OLDW HCO 20 1.87 (1.46, 2.38) 2.54
OLDW HCO 21 2.42 (1.48, 3.95) 1.33
OLDW HCO 22 2.77 (1.94, 3.95) 1.90
OLDW HCO 23 1.25 (0.78, 2.01) 1.40
OLDW HCO 24 2.31 (1.54, 3.45) 1.67
OLDW HCO 25 1.80 (1.48, 2.18) 2.86
OLDW HCO 26 2.07 (1.75, 2.46) 3.00
OLDW HCO 27 3.25 (1.29, 8.19) 0.51
OLDW HCO 28 1.70 (1.36, 2.13) 2.67
OLDW HCO 29 2.38 (1.86, 3.03) 2.54
OLDW HCO 30 2.10 (1.52, 2.90) 2.08
OLDW HCO 31 1.68 (0.83, 3.40) 0.79
OLDW HCO 32 3.31 (2.37, 4.63) 2.01
OLDW HCO 33 0.91 (0.40, 2.06) 0.63
OLDW HCO 34 2.47 (1.51, 4.04) 1.33
OLDW HCO 35 2.45 (1.36, 4.43) 1.04
OLDW HCO 36 1.97 (1.32, 2.95) 1.69
OLDW HCO 37 2.68 (1.94, 3.70) 2.07
OLDW HCO 38 1.80 (1.35, 2.40) 2.26
OLDW HCO 39 0.80 (0.10, 6.47) 0.11
OLDW HCO 40 1.47 (0.73, 2.99) 0.79
OLDW HCO 41 4.02 (3.13, 5.17) 2.50
OLDW HCO 42 1.34 (0.55, 3.25) 0.55
OLDW HCO 43 4.49 (1.03, 19.54) 0.22
OLDW HCO 44 4.47 (1.83, 10.91) 0.54
OLDW HCO 45 2.09 (1.89, 2.31) 3.37
RCAV 1.56 (1.19, 2.04) 2.37
REGARDS 2.08 (1.47, 2.95) 1.95
SCREAM 1.17 (0.75, 1.82) 1.51
SEED 1.30 (0.66, 2.56) 0.85
SMART 4.45 (1.79, 11.04) 0.53
UKBioBank 1.17 (0.48, 2.88) 0.53
Subtotal (I-squared = 52.3%, p = 0.000) 2.05 (1.91, 2.20) 89.70
CKD cohorts
CanPREDDICT 3.75 (2.09, 6.72) 1.05
CARE_FOR_HOMe 5.07 (1.60, 16.10) 0.34
CRIC 1.00 (0.66, 1.51) 1.65
GCKD 1.12 (0.55, 2.29) 0.79
Hongkong_CKD 1.01 (0.42, 2.45) 0.55
LCC 0.67 (0.09, 4.88) 0.12
Nanjing_CKD 2.02 (0.83, 4.93) 0.54
PSP-CKD 1.26 (0.39, 4.04) 0.34
RENAAL 1.06 (0.59, 1.90) 1.06
SHARP 1.83 (1.05, 3.19) 1.13
SKS 0.72 (0.23, 2.26) 0.35
SRR-CKD 1.98 (1.24, 3.16) 1.41
Sunnybrook 0.37 (0.05, 2.70) 0.13
WestScotCKD 2.46 (1.08, 5.64) 0.61
YWSCC 3.92 (0.86, 17.84) 0.21
Subtotal (I-squared = 52.4%, p = 0.009) 1.59 (1.18, 2.15) 10.30
Overall (I-squared = 54.2%, p = 0.000) 1.99 (1.85, 2.14) 100.00
NOTE: Weights are from random effects analysis
.25
.5
1
2
4
16
32

C. Heart failure

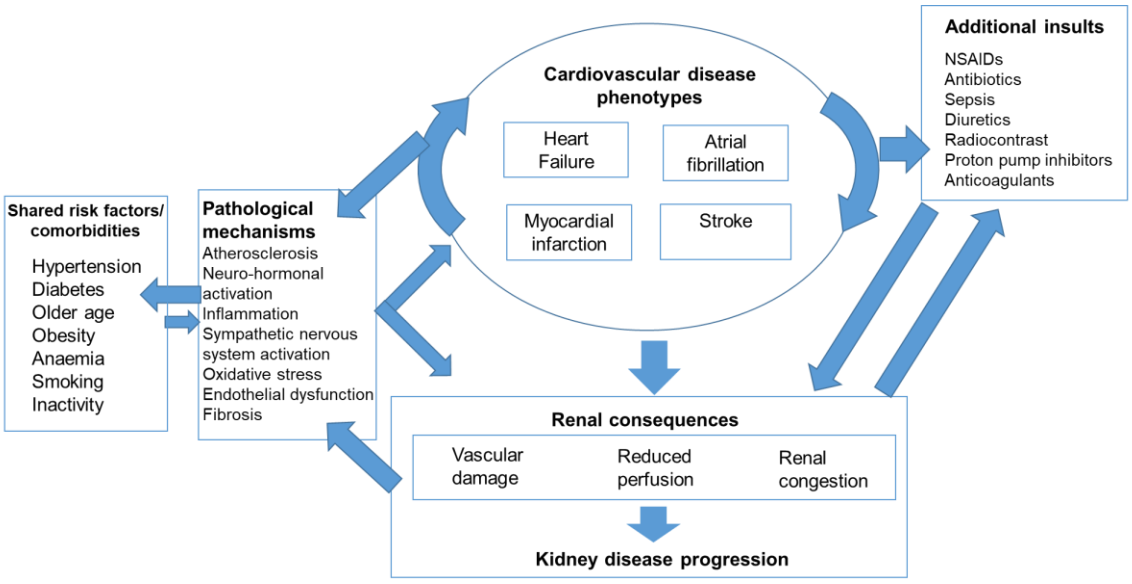


D. Atrial fibrillation




Models adjusted to age, sex, black race, eGFR, smoking status, diabetes mellitus, systolic blood pressure and antihypertensive medication use, total cholesterol, HDL cholesterol and use of lipid lowering medication use, body mass, missing indicator of ACR and log-transformed ACR.

**Figure S2. Proposed pathways linking CVD events with kidney disease progression.**




Shared risk factors between heart failure and kidney disease (e.g. hypertension, diabetes) contribute to the gradual progression of both heart and kidney disease. In addition, comorbidity-driven inflammatory state surrounding heart and kidney disease may accelerate tissue fibrosis, endothelial dysfunction, microvascular ischaemia, and oxidative stress. These conditions are manifested as heart failure, stroke, atrial fibrillation, and myocardial infarction. Additional pathways linking kidney disease to heart disease exist as well but are not the focus of this figure as they are less relevant for kidney disease incidence.

## References


1. Matsushita K, van der Velde M, Astor BC, Woodward M, Levey AS, de Jong PE, *et al.* Association of estimated glomerular filtration rate and albuminuria with all-cause and cardiovascular mortality in general population cohorts: a collaborative meta-analysis. *Lancet* 2010;**375**:2073-81.
2. Matsushita K, Mahmoodi BK, Woodward M, Emberson JR, Jafar TH, Jee SH, *et al.* Comparison of risk prediction using the CKD-EPI equation and the MDRD study equation for estimated glomerular filtration rate. *JAMA* 2012;**307**:1941-51.
3. Hallan SI, Matsushita K, Sang Y, Mahmoodi BK, Black C, Ishani A, *et al.* Age and Association of Kidney Measures With Mortality and End-stage Renal Disease. *JAMA* 2012;**308**:2349-2360.
4. Levey AS, Coresh J, Greene T, Marsh J, Stevens LA, Kusek JW, *et al.* Expressing the Modification of Diet in Renal Disease Study Equation for Estimating Glomerular Filtration Rate with Standardized Serum Creatinine Values. *Clin Chem* 2007;**53**:766-772.
5. Levey AS, Stevens LA, Schmid CH, Zhang YL, Castro AF, 3rd, Feldman HI, *et al.* A new equation to estimate glomerular filtration rate. *Ann Intern Med* 2009;**150**:604-12.
6. Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. *Kidney inter., Suppl* 2013;**3**:1-150.
7. OptumLabs. OptumLabs and OptumLabs Data Warehouse (OLDW) Descriptions and Citation. In. Eden Prairie, MN: n.p.; June 2020.
8. Orozco JM, Krawczyk PA, Scaria SM, Cangelosi AL, Chan SH, Kunchok T, *et al.* Dihydroxyacetone phosphate signals glucose availability to mTORC1. *Nat Metab* 2020;**2**:893-901.
9. Patel A, MacMahon S, Chalmers J, Neal B, Woodward M, Billot L, *et al.* Effects of a fixed combination of perindopril and indapamide on macrovascular and microvascular outcomes in patients with type 2 diabetes mellitus (the ADVANCE trial): a randomised controlled trial. *Lancet* 2007;**370**:829-40.
10. Matsushita K, Selvin E, Bash LD, Franceschini N, Astor BC, Coresh J. Change in estimated GFR associates with coronary heart disease and mortality. *J Am Soc Nephrol* 2009;**20**:2617-24.
11. Levin A, Rigatto C, Brendan B, Madore F, Muirhead N, Holmes D, *et al.* Cohort profile: Canadian study of prediction of death, dialysis and interim cardiovascular events (CanPREDDICT). *BMC Nephrol* 2013;**14**:121.
12. Landray MJ, Thambyrajah J, McGlynn FJ, Jones HJ, Baigent C, Kendall MJ, *et al.* Epidemiological evaluation of known and suspected cardiovascular risk factors in chronic renal impairment. *Am J Kidney Dis* 2001;**38**:537-46.
13. Denker M, Boyle S, Anderson AH, Appel LJ, Chen J, Fink JC, *et al.* Chronic Renal Insufficiency Cohort Study (CRIC): Overview and Summary of Selected Findings. *Clin J Am Soc Nephrol* 2015;**10**:2073-83.
14. Titze S, Schmid M, Kottgen A, Busch M, Floege J, Wanner C, *et al.* Disease burden and risk profile in referred patients with moderate chronic kidney disease: composition of the German Chronic Kidney Disease (GCKD) cohort. *Nephrol Dial Transplant* 2015;**30**:441-51.
15. Perkins RM, Bucaloiu ID, Kirchner HL, Ashouian N, Hartle JE, Yahya T. GFR decline and mortality risk among patients with chronic kidney disease. *Clin J Am Soc Nephrol* 2011;**6**:1879-86.
16. Marks A, Black C, Fluck N, Smith WC, Prescott GJ, Clark LE, *et al.* Translating chronic kidney disease epidemiology into patient care--the individual/public health risk paradox. *Nephrol Dial Transplant* 2012;**27 Suppl 3**:iii65-72.
17. Hebert HL, Shepherd B, Milburn K, Veluchamy A, Meng W, Carr F, *et al.* Cohort Profile: Genetics of Diabetes Audit and Research in Tayside Scotland (GoDARTS). *Int J Epidemiol* 2018;**47**:380-381j.
18. Cirillo M, Terradura-Vagnarelli O, Mancini M, Menotti A, Zanchetti A, Laurenzi M. Cohort profile: The Gubbio Population Study. *Int J Epidemiol* 2014;**43**:713-20.
19. Cai QZ, Lu XZ, Lu Y, Wang AY. Longitudinal changes of cardiac structure and function in CKD (CASCADE study). *J Am Soc Nephrol* 2014;**25**:1599-608.
20. Naylor KL, McArthur E, Leslie WD, Fraser LA, Jamal SA, Cadarette SM, *et al.* The three-year incidence of fracture in chronic kidney disease. *Kidney Int* 2014;**86**:810-8.
21. Major RW, Shepherd D, Medcalf JF, Xu G, Gray LJ, Brunskill NJ. Comorbidities and outcomes in South Asian individuals with chronic kidney disease: an observational primary care cohort. *Nephrol Dial Transplant* 2021;**37**:108-114.
22. Shalev V, Chodick G, Goren I, Silber H, Kokia E, Heymann AD. The use of an automated patient registry to manage and monitor cardiovascular conditions and related outcomes in a large health organization. *Int J Cardiol* 2011;**152**:345-9.

23. van Zuilen AD, Bots ML, Dulger A, van der Tweel I, van Buren M, Ten Dam MA, *et al.* Multifactorial intervention with nurse practitioners does not change cardiovascular outcomes in patients with chronic kidney disease. *Kidney Int* 2012;**82**:710-717.
24. Klahr S, Levey AS, Beck GJ, Caggiula AW, Hunsicker L, Kusek JW, *et al.* The effects of dietary protein restriction and blood-pressure control on the progression of chronic renal disease. Modification of Diet in Renal Disease Study Group. *N Engl J Med* 1994;**330**:877-84.
25. Kronenberg F, Kuen E, Ritz E, Junker R, Konig P, Kraatz G, *et al.* Lipoprotein(a) serum concentrations and apolipoprotein(a) phenotypes in mild and moderate renal failure. *J Am Soc Nephrol* 2000;**11**:105-15.
26. Tayo BO, Teil M, Tong L, Qin H, Khitrov G, Zhang W, *et al.* Genetic background of patients from a university medical center in Manhattan: implications for personalized medicine. *PLoS ONE* 2011;**6**:e19166.
27. Junyent M, Martinez M, Borras M, Bertriu A, Coll B, Craver L, *et al.* [Usefulness of imaging techniques and novel biomarkers in the prediction of cardiovascular risk in patients with chronic kidney disease in Spain: the NEFRONA project]. *Nefrologia* 2010;**30**:119-26.
28. Moranne O, Froissart M, Rossert J, Gauci C, Boffa JJ, Haymann JP, *et al.* Timing of onset of CKD-related metabolic complications. *J Am Soc Nephrol* 2009;**20**:164-71.
29. Major RW, Brown C, Shepherd D, Rogers S, Pickering W, Warwick GL, *et al.* The Primary-Secondary Care Partnership to Improve Outcomes in Chronic Kidney Disease (PSP-CKD) Study: A Cluster Randomized Trial in Primary Care. *J Am Soc Nephrol* 2019;**30**:1261-1270.
30. Kovesdy CP, Norris KC, Boulware LE, Lu JL, Ma JZ, Streja E, *et al.* Association of Race With Mortality and Cardiovascular Events in a Large Cohort of US Veterans. *Circulation* 2015;**132**:1538-48.
31. Howard VJ, Cushman M, Pulley L, Gomez CR, Go RC, Prineas RJ, *et al.* The reasons for geographic and racial differences in stroke study: objectives and design. *Neuroepidemiology* 2005;**25**:135-43.
32. Brenner BM, Cooper ME, de Zeeuw D, Keane WF, Mitch WE, Parving HH, *et al.* Effects of losartan on renal and cardiovascular outcomes in patients with type 2 diabetes and nephropathy. *N Engl J Med* 2001;**345**:861-9.
33. Gasparini A, Evans M, Coresh J, Grams ME, Norin O, Qureshi AR, *et al.* Prevalence and recognition of chronic kidney disease in Stockholm healthcare. *Nephrol Dial Transplant* 2016;**31**:2086-2094.
34. Wong CW, Lamoureux EL, Cheng CY, Cheung GC, Tai ES, Wong TY, *et al.* Increased Burden of Vision Impairment and Eye Diseases in Persons with Chronic Kidney Disease - A Population-Based Study. *EBioMedicine* 2016;**5**:193-7.
35. Tollitt J, Odudu A, Flanagan E, Chinnadurai R, Smith C, Kalra PA. Impact of prior stroke on major clinical outcome in chronic kidney disease: the Salford kidney cohort study. *BMC Nephrol* 2019;**20**:432.
36. Evans M, van Stralen KJ, Schon S, Prutz KG, Stendahl M, Rippe B, *et al.* Glomerular filtration rate-estimating equations for patients with advanced chronic kidney disease. *Nephrol Dial Transplant* 2013;**28**:2518-26.
37. Tangri N, Stevens LA, Griffith J, Tighiouart H, Djurdjev O, Naimark D, *et al.* A predictive model for progression of chronic kidney disease to kidney failure. *JAMA* 2011;**305**:1553-9.
38. Bycroft C, Freeman C, Petkova D, Band G, Elliott LT, Sharp K, *et al.* The UK Biobank resource with deep phenotyping and genomic data. *Nature* 2018;**562**:203-209.
39. Solbu MD, Thomson PC, Macpherson S, Findlay MD, Stevens KK, Patel RK, *et al.* Serum phosphate and social deprivation independently predict all-cause mortality in chronic kidney disease. *BMC Nephrol* 2015;**16**:194.