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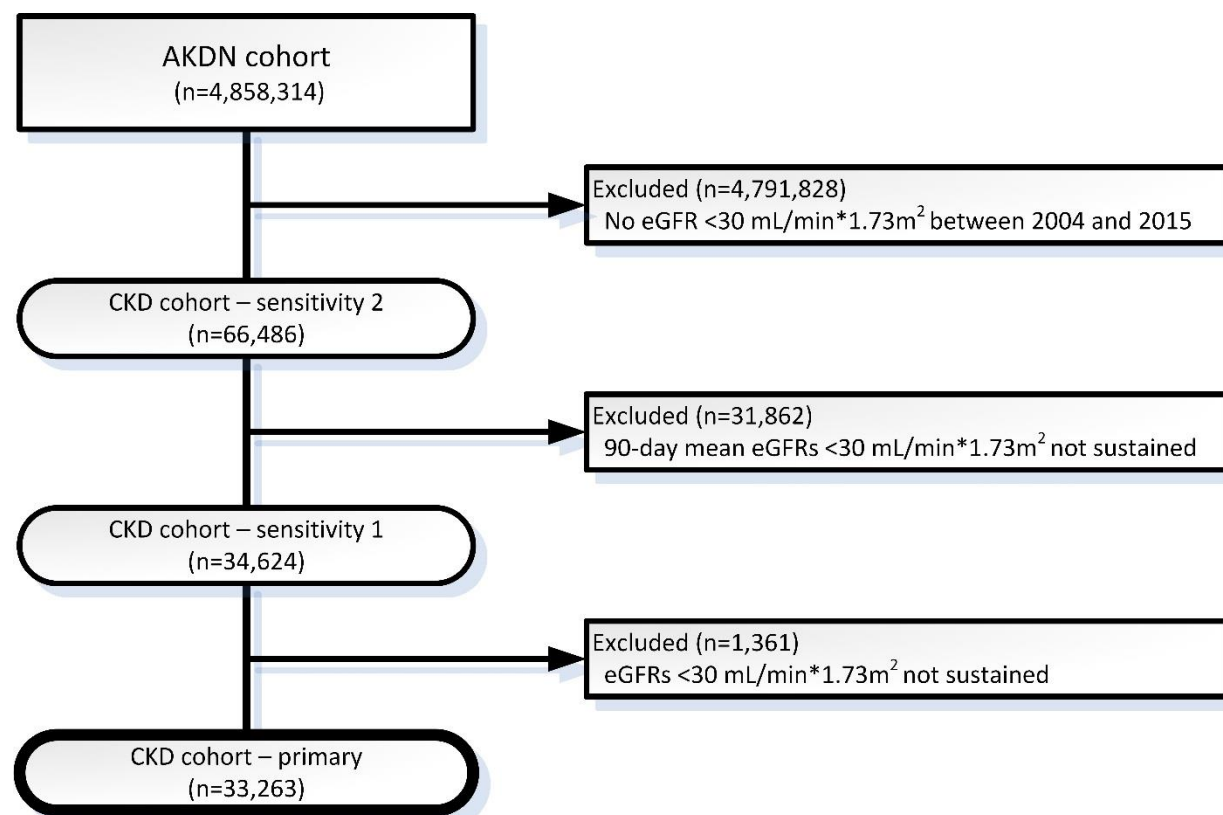
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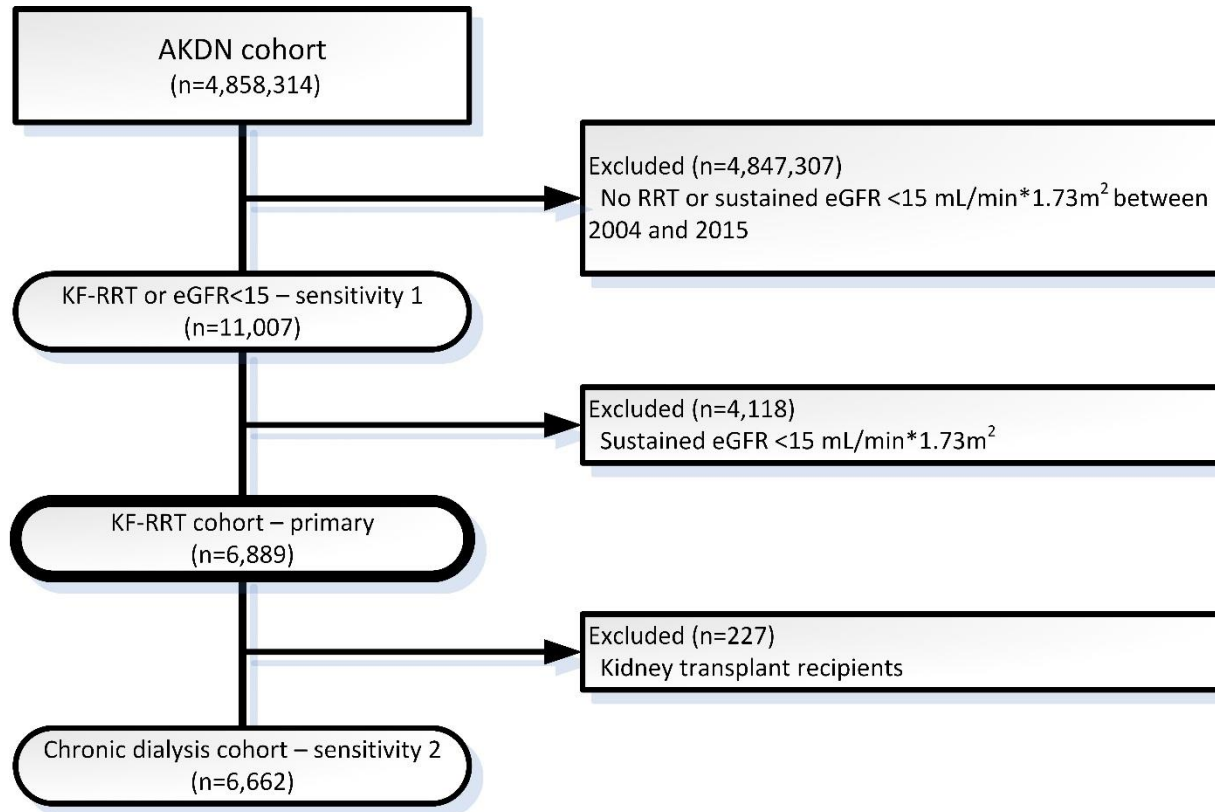
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Supplemental Figure 1: Participant flow diagram for cohorts with severe CKD



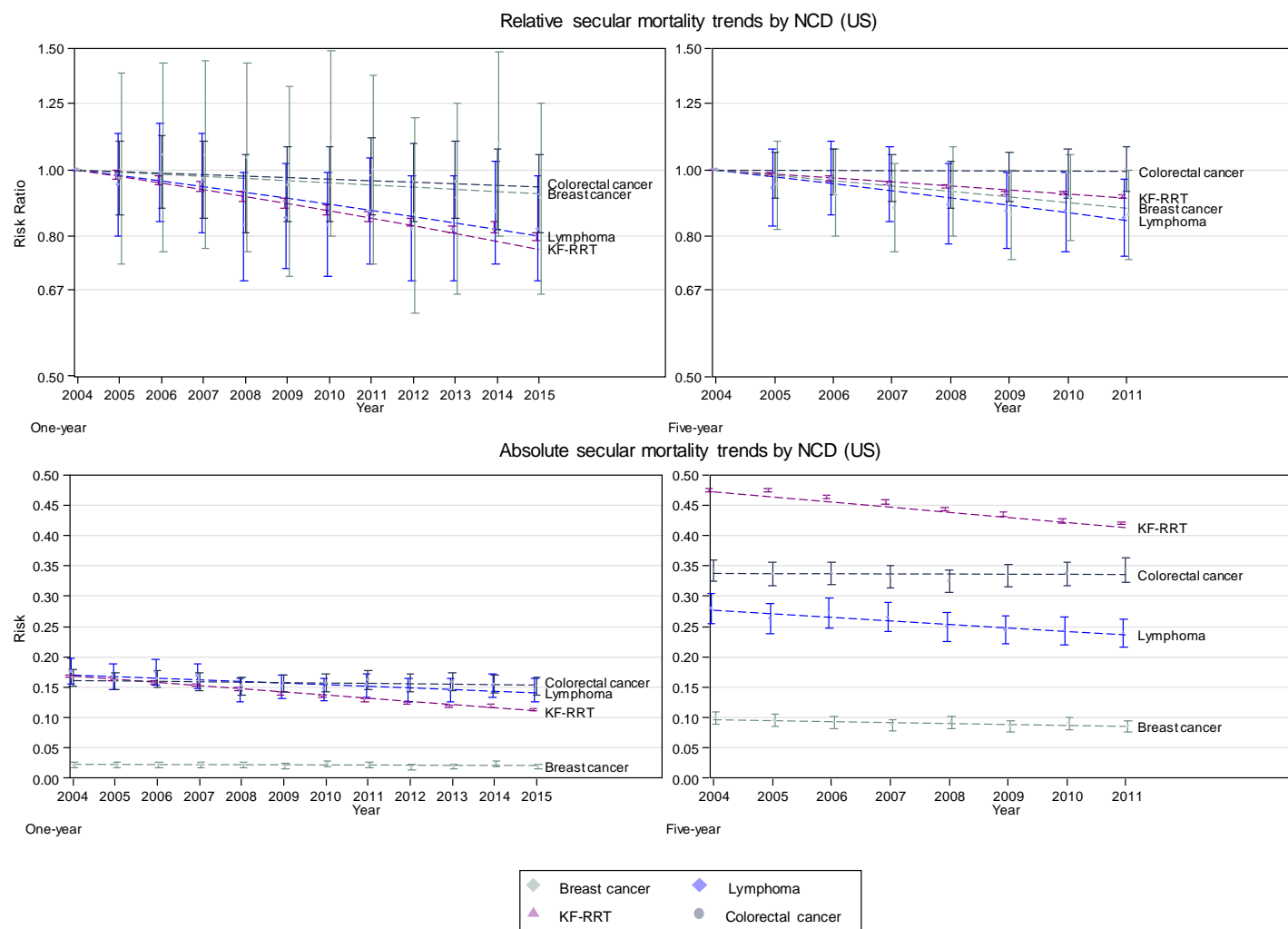
The primary definition of severe CKD is sustained values of eGFR <30 mL/min*1.73m², meaning the absence of values ≥30 mL/min*1.73m² until end of follow-up. The first alternative definition of severe CKD (sensitivity 1) does not require sustained eGFR <30 mL/min*1.73m². In this sensitivity analysis, we defined severe CKD by the first value of eGFR <30 mL/min*1.73m² where all the following 90-day averages of eGFR for that participant were <30 mL/min*1.73m². The second alternative definition of severe CKD (sensitivity 2) does not require sustained eGFR <30 mL/min*1.73m². In this sensitivity analysis, we defined severe CKD by the first value of eGFR <30 mL/min*1.73m² regardless of any ensuing eGFR values. CKD severe chronic kidney disease, AKDN Alberta Kidney Disease Network, eGFR estimated glomerular filtration rate

Supplemental Figure 2: Participant flow diagram for cohorts with kidney failure



“KF-RRT” denotes the primary analysis. “KF-RRT or eGFR<15 mL/min/1.73m²” denotes a sensitivity analysis in which this composite outcome was used instead. “Chronic dialysis” denotes a sensitivity analysis in which preemptive transplantation was omitted from the definition of KF-RRT. AKDN Alberta Kidney Disease Network, eGFR estimated glomerular filtration rate, KF-RRT kidney failure treated with renal replacement (dialysis or kidney transplantation), RRT renal replacement therapy

Supplemental Figure 3: Absolute and relative changes in mortality following diagnosis, by NCD (US cohorts)

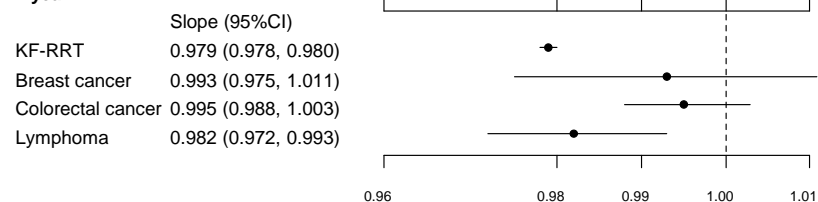


Results are adjusted for age and presented with 95% confidence intervals, as compared to a referent year of 2004. Absolute results are directly standardized for 2011 mean age. Relative trends express risk ratio and absolute trends express reduction in the risk of mortality, both expressed per year of follow-up. The trend lines are estimated using generalized linear models with a Gaussian family and identity links. The number of significant digits presented depends on the unit of analysis. KF-RRT kidney failure treated with renal replacement (dialysis or kidney transplantation), NCD noncommunicable disease, US United States of America

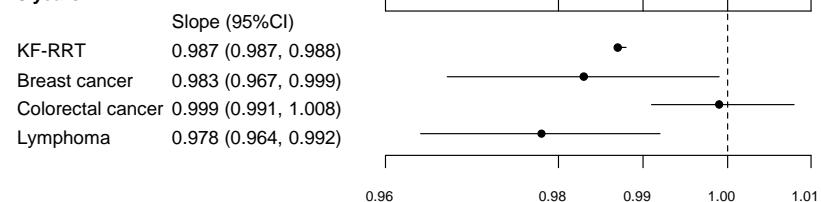
Supplemental Figure 4: Forest plots showing rate of change in mortality following diagnosis, by NCD (US cohorts)

Relative secular mortality trends by NCD (US)

1 year

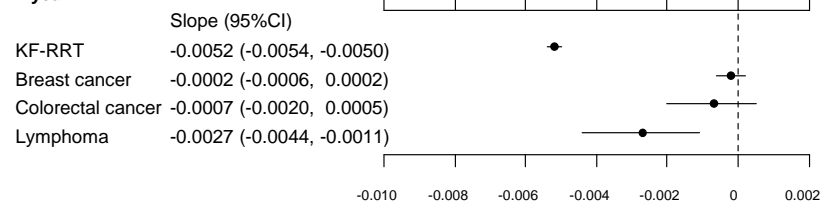


5 years

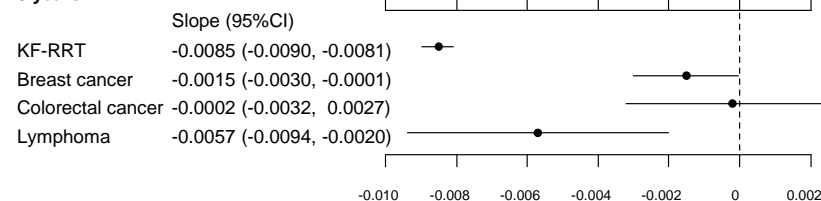


Absolute secular mortality trends by NCD (US)

1 year

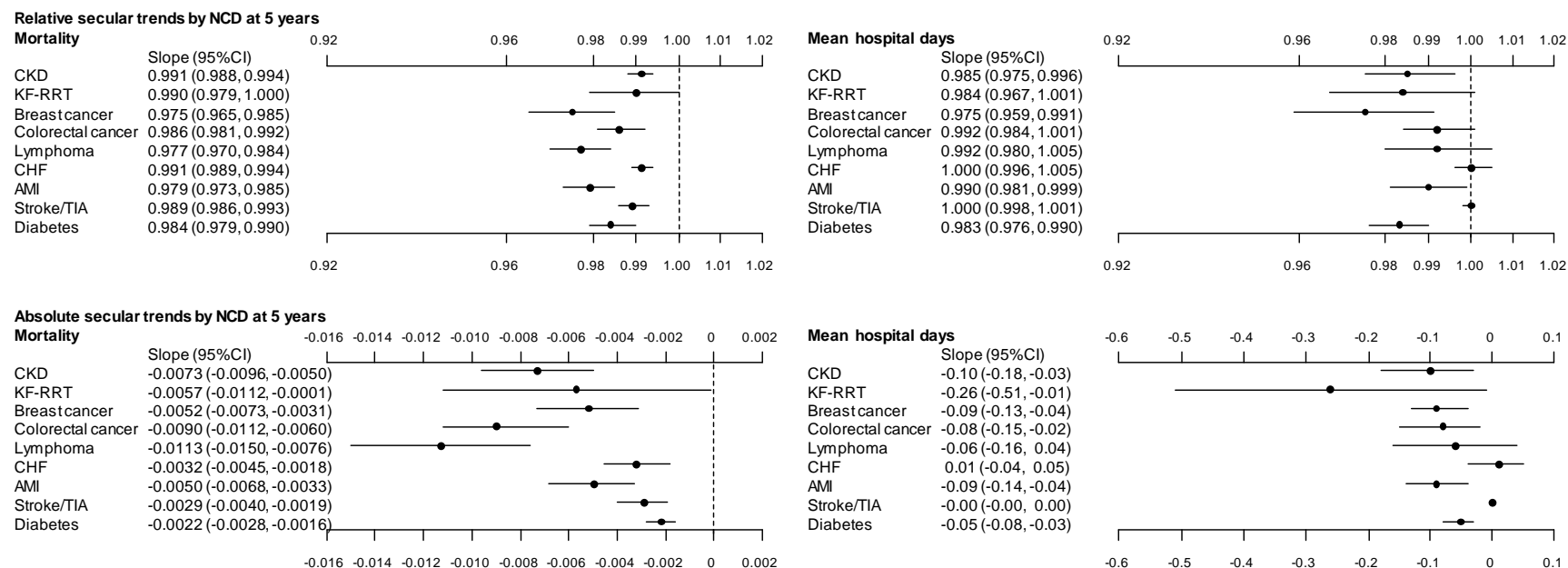


5 years



Results are adjusted for age, and express risk ratio with 95% confidence intervals, as compared to a referent year of 2004. Absolute results are directly standardized for 2011 mean age. Relative trends express risk ratio. Absolute trends express reduction in the risk of mortality, expressed per year of follow-up. The slopes are estimated using generalized linear models with a Gaussian family and identity links. The number of significant digits presented depends on the unit of analysis. CI confidence interval, KF-RRT kidney failure treated with renal replacement (dialysis or kidney transplantation), NCD noncommunicable disease, US United States of America

Supplemental Figure 5: Forest plots showing fully adjusted rate of change in mortality and LOS at 5 years following diagnosis, by NCD (Alberta cohorts)



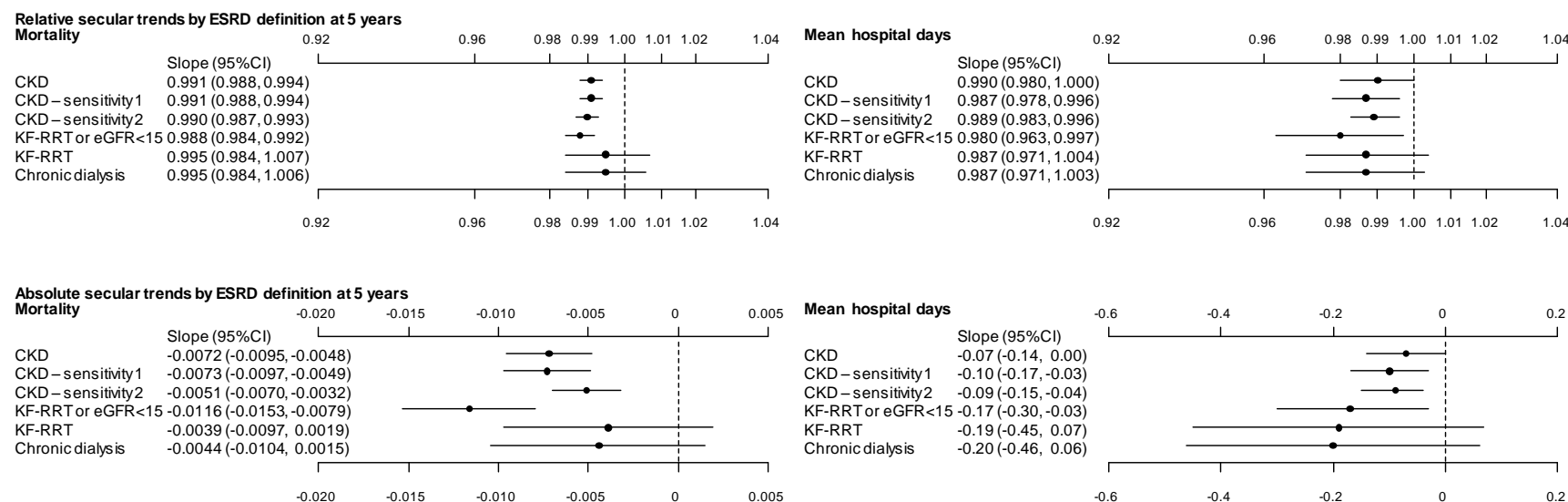
Results are adjusted for age, sex, rural status, social assistance and comorbidities from Table 1 and express risk ratio (mortality) or rate ratio (length of stay) with 95% confidence intervals. Absolute results are directly standardized for 2011 mean age, sex, rural status, social assistance and comorbidities from Table 1. Relative trends express risk ratio (mortality) or rate ratio (length of stay), both expressed per year of follow-up. Absolute trends express reduction in the risk of mortality or reduction in the number of days in hospital, both expressed per year of follow-up. The slopes are estimated using generalized linear models with a Gaussian family and identity or log links depending on the outcome. The number of significant digits presented depends on the unit of analysis. AMI myocardial infarction, CHF congestive heart failure, CI confidence interval, CKD chronic kidney disease, KF-RRT kidney failure treated with renal replacement (dialysis or kidney transplantation), LOS length of stay, NCD noncommunicable disease, PAD peripheral artery disease, TIA transient ischemic attack

Supplemental Figure 6: Ranking of fully adjusted rate of change in mortality and length of stay at 5 years following diagnosis, by NCD (Alberta cohorts)

| | Relative secular trend ranking | Absolute secular trend ranking |
|--------------------|--------------------------------|--------------------------------|
| Mortality | Breast cancer (0.975) | Lymphoma (-0.0113) |
| | Lymphoma (0.977) | Colorectal cancer (-0.0090) |
| | AMI (0.982) | CKD (-0.0073) |
| | Diabetes (0.988) | KF-RRT (-0.0057) |
| | Colorectal cancer (0.986) | Breast cancer (-0.0052) |
| | Stroke/TIA (0.989) | AMI (-0.0050) |
| | KF-RRT (0.990) | CHF (-0.0032) |
| | CKD (0.991) | Stroke/TIA (-0.0029) |
| | CHF (0.991) | Diabetes (-0.0022) |
| Mean Hospital days | Breast cancer (0.975) | KF-RRT (-0.26) |
| | Diabetes (0.983) | CKD (-0.10) |
| | KF-RRT (0.984) | Breast cancer (-0.09) |
| | CKD (0.985) | AMI (-0.09) |
| | AMI (0.990) | Colorectal cancer (-0.08) |
| | Colorectal cancer (0.992) | Lymphoma (-0.06) |
| | Lymphoma (0.992) | Diabetes (-0.05) |
| | Stroke/TIA (1.000) | Stroke/TIA (-0.00) |
| | CHF (1.000) | CHF (0.01) |

Ranked by largest to smallest reduction between 2004 and 2015. The number of significant digits presented depends on the unit of analysis. AMI acute myocardial infarction, CHF congestive heart failure, CKD chronic kidney disease, KF-RRT kidney failure treated with renal replacement (dialysis or kidney transplantation), NCD noncommunicable disease, PAD peripheral artery disease, TIA transient ischemic attack

Supplemental Figure 7: Forest plots showing rate of change in mortality and LOS at 5 years following diagnosis, by NCD (Alberta cohort), using alternative definitions of severe CKD and kidney failure



The primary definition of severe CKD is sustained values of eGFR $<30 \text{ mL/min} \cdot 1.73\text{m}^2$, meaning the absence of values $\geq 30 \text{ mL/min} \cdot 1.73\text{m}^2$ until end of follow-up. The first alternative definition of severe CKD (sensitivity 1) does not require sustained eGFR $<30 \text{ mL/min} \cdot 1.73\text{m}^2$. In this sensitivity analysis, we defined severe CKD by the first value of eGFR $<30 \text{ mL/min} \cdot 1.73\text{m}^2$ where all the following 90-day averages of eGFR for that participant were $<30 \text{ mL/min} \cdot 1.73\text{m}^2$. The second alternative definition of severe CKD (sensitivity 2) does not require sustained eGFR $<30 \text{ mL/min} \cdot 1.73\text{m}^2$. In this sensitivity analysis, we defined severe CKD by the first value of eGFR $<30 \text{ mL/min} \cdot 1.73\text{m}^2$ regardless of any ensuing eGFR values. “KF-RRT” denotes the primary analysis. “KF-RRT or eGFR $<15 \text{ mL/min} \cdot 1.73\text{m}^2$ ” denotes a sensitivity analysis in which this composite outcome was used instead. “Chronic dialysis” denotes a sensitivity analysis in which preemptive transplantation was omitted from the definition of KF-RRT.

Results from severe CKD and kidney failure are adjusted for age, and presented with 95% confidence intervals. Absolute results are directly standardized for 2011 mean age. Relative trends express risk ratio (mortality) or rate ratio (length of stay), both expressed per year of follow-up. Absolute trends express reduction in the risk of mortality or reduction in the number of days in hospital, both expressed per year of follow-up. The slopes are estimated using generalized linear models with a Gaussian family and identity links. The number of significant digits presented depends on the unit of analysis. CKD severe chronic kidney disease, CI confidence interval, eGFR estimated glomerular filtration rate, ESRD end-stage renal disease, KF-RRT kidney failure treated with renal replacement (dialysis or kidney transplantation), LOS length of stay, NCD noncommunicable disease