Background Hypertension has been associated with an increased risk of kidney cancer, but evidence of association with cancers elsewhere in the urinary tract is mixed. We examined the association between hypertension and the incidence of cancers of the kidney (by histotype), and urinary tract, in a large cohort of UK women.

Methods Participants were recruited in 1996–2001 from 66 NHS breast-screening centres, and completed a questionnaire on anthropometric, reproductive and lifestyle factors, and medical history, including self-reported hypertension requiring treatment. They were followed for cancer and death via record linkage to national registries. We used Cox regression models to estimate relative risks (RRs) of cancers of the kidney and urinary tract, associated with self-reported hypertension requiring treatment at recruitment, adjusted for potential confounders. Analyses were conducted in Stata 15.

Results In 1,319,718 women without previous cancer, 211,663 (16%) reported at recruitment that they were currently being treated for hypertension. After 16.9 years (SD 4.6) mean follow-up, 5391 kidney cancers, including 4248 renal cell carcinomas and 442 urothelial carcinomas, accrued. Hypertension requiring treatment at recruitment was associated with a significantly greater increase in the risk of renal cell carcinomas (RR=1.69, 95% CI: 1.57–1.82) than urothelial carcinomas of the kidney (RR=1.27, 95% CI: 1.00–1.17); heterogeneity by histotype, p=0.02. There were no clear associations between hypertension and the risk of urothelial carcinomas elsewhere in the urinary tract (ureter: n=249, RR=0.82, 95% CI: 0.57–1.17; bladder: n=2929, RR=1.00, 95% CI: 0.91–1.11). The association seen with renal cell carcinomas persisted even after exclusion of the first 10 years of follow-up (RR=1.69, 95% CI: 1.54–1.85), suggesting it was not an artefact of reverse causation.

Conclusion Hypertension is strongly associated with an increased risk of kidney cancer, with significant heterogeneity by histotype. The risk of renal cell carcinoma is substantially increased in those with a history of hypertension, but there is little or no association with urothelial carcinomas, either in the kidney or the rest of the urinary tract.