A wide variety of factors such as immunological factors, living environment factors, and genetic predisposition are involved in the development of chronic kidney disease (CKD), and these interactions accelerate the progress of the disease. To identify exacerbation factors and prognostic factors of CKD, it is important to systematically create a database of the vast amount of clinical information generated in daily clinical practice. Analysis of the database may reveal pathological mechanisms of CKD, which may not be evident in individual cases alone. Observational studies require the application of appropriate statistical analysis techniques that control confounding and lead to accurate estimates. We have developed and validated clinicopathological prediction rules for calculating the absolute risk of long-term renal prognosis in a large cohort of IgA nephropathy. Our prediction rules showed the similar predictive performance for kidney prognosis in two independent cohorts (production cohort, n = 698 and validation cohort, n = 702). This result suggests that our risk prediction rule is statistically valid and accurate for the risk stratification of individuals with IgA nephropathy. Also, adjustment for covariates using propensity score is useful for estimating the causal effects of therapeutic procedures in observational studies that are non-randomized and affected by various confounders. Therefore, we evaluated the effect of vitamin D receptor activator (VDRA) on infection mortality using the IPTW method and the instrumental variable method in a database of more than 3500 hemodialysis patients (Q cohort study). Compared with the non-administration group (n = 1,007) and the oral administration group (n = 1,878), the intravenous administration group (n = 492) showed significantly lower risk of infection death. We have sought to elucidate prognostic factors and verify treatment effects in CKD patients through the cohort surveys and its analysis. In this talk, we will also outline a clinical epidemiological cohort study aimed at establishing evidence for the prevention of CKD progression.