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Spotlight on CKD deaths—increasing mortality worldwide

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Abstract

In the USA, mortality among patients with chronic kidney disease (CKD) and end-stage renal disease has declined over the past two decades. By contrast, new data indicate that the rate of CKD-associated deaths is increasing worldwide. This important finding highlights CKD as a major contributor to global morbidity and mortality.

Despite increasing recognition of the high prevalence and associated mortality of pre-dialysis and dialysis-dependent chronic kidney disease (CKD) in industrialized nations such as the USA[1,2] and the UK,[3] a large knowledge gap remains with regards to the epidemiology of CKD in less-developed countries. A new report from the Global Burden of Disease (GBD) Study has reduced this gap and identified CKD as an increasing cause of mortality worldwide.[4]

In their recent study, the GBD 2013 Mortality and Causes of Death Collaborators systematically quantified and compared the magnitude of all-cause and cause-specific mortality (306 causes of death and disability) in 188 countries between 1990 and 2013.[4] Building on prior reports from 1990 and 2010,[5,6] these latest data highlight global epidemiologic achievements made between 1990 and 2013, including an increase in life expectancy from 65.3 years to 71.5 years, a rise in the mean age of death from 46.7 years to 59.3 years, and a substantial decline in child mortality, largely as a result of a reduction in deaths from infectious causes.[4] Importantly, the decrease in premature mortality has led to a shift towards a larger proportion of deaths occurring in people aged >80 years, and increased longevity has led to a larger burden of non-communicable chronic illnesses in this older population. These findings should be used to frame and prioritize national, regional and global health policies.

Although the GBD 2013 report shows that age-standardized mortality has improved for most communicable and non-communicable conditions, CKD is among a small number of diseases each accounting for >100,000 deaths in 2013 for which death rates have

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Competing interests
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substantially risen since 1990 (Figure 1). Age-standardized mortality due to CKD increased by 36.9% from 11.6 deaths per 100,000 population in 1990 to 15.8 deaths per 100,000 population in 2013, making this disease the 19th leading global cause of years of life lost in 2013 compared with the 36th leading cause in 1990. The report also reveals the disproportionate burden of CKD-associated deaths across various geographic regions. CKD was among the top ten causes of years of life lost in Latin America and the Caribbean, Southeast and East Asia and Oceania, North Africa and the Middle East, as well as in the high-income nations Singapore, Greece and Israel.

The new data advance our knowledge of the global epidemiology of CKD in several key ways. By synthesizing vital registration data, sibling history survey data, sample registration data and household recall of deaths from 21 regions and 7 supra-regions, this 'big-data' report provides new information on the mortality burden of CKD in parts of the world that were not previously included in major collaborative studies from groups such as the CKD Prognosis Consortium[7] and the United States Renal Data System (USRDS).[2] Although the high prevalence of CKD in developing nations such as China is increasingly recognized owing to reliable national survey data,[8,9] the GBD Study 2013 highlights other regions in need of greater study, such as Latin America and the Caribbean; CKD is among the top five causes of years of life lost in Mexico, El Salvador, Nicaragua and Barbados. USRDS data show that the unadjusted and adjusted mortality rates for subpopulations of patients with CKD in the USA (for example, Medicare beneficiaries aged ≥66 years) and for patients with ESRD have decreased in the past two decades,[2] whereas the GBD Study 2013 highlights CKD as a neglected disease and a major global contributor to loss of health and life.[4]

Several limitations bear mention with regards to interpretation of the new findings. First, as cause of death was ascertained using ICD-9 and ICD-10 codes, the trends in CKD mortality over time might have been influenced by increasing recognition of the disease and, therefore, greater likelihood of CKD coding. Furthermore, the reliance on diagnostic code data alone to define CKD as a cause of death might have resulted in under-coding of people with early stages of CKD, leading to a larger proportion of reports of advanced CKD and subsequent CKD-associated deaths. Second, although mortality is well known to increase with severity of CKD, the report does not distinguish between pre-dialysis and dialysis-dependent CKD as a cause of death. Third, given that cardiovascular deaths largely account for mortality among patients with CKD, the reliance on cause of death codes might have resulted in under estimation of the numbers of CKD-associated deaths; indeed, ischaemic heart disease was among the top three causes of death in 32 developed countries and in many less-developed countries. Fourth, acute kidney injury (AKI) was not included as a cause of death in the analysis. AKI is associated with increased mortality[10] and given its bidirectional relationship with CKD (AKI is a major risk factor for CKD and *vice versa*), it may account for CKD-associated deaths not captured in the GBD 2013 report.[4]

In conclusion, the GBD Study 2013[4] conveys unprecedented information with regards to the global burden of CKD-associated mortality and its disproportionate burden across under-recognized regions. An urgent need exists to obtain further data on the prevalence and severity of CKD in less-developed nations, as well as granular data on risk factors for CKD-associated mortality that might be country-specific, such as limited CKD education and awareness; reduced availability and access to health care resources; heterogeneous treatment and/or practice patterns (such as use of haemodialysis, peritoneal dialysis and kidney transplantation) and differential comorbidity burdens across populations.

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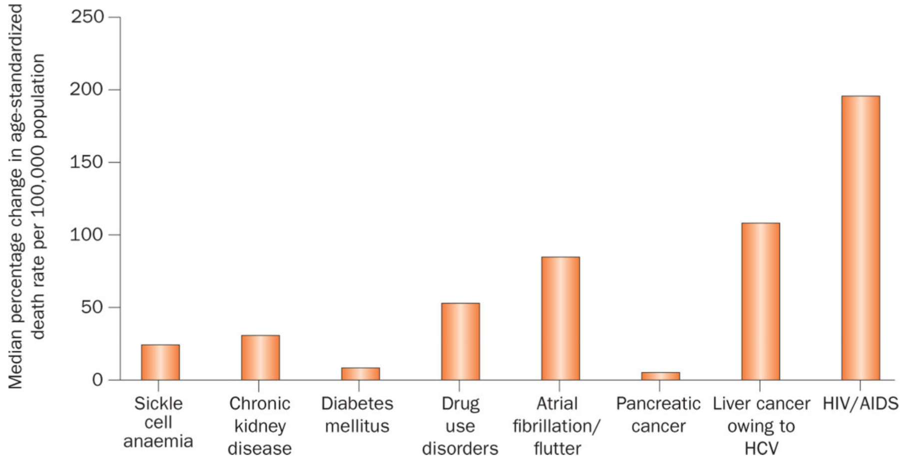

Figure 1.

Leading causes of >100,000 deaths per year in 2013 for which age-standardized death rates have increased since 1990.[4] Abbreviation: HCV, hepatitis C virus.