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Response to Letter to the Editor

# Response by Sarfo to letter regarding "Estimated glomerular filtration rate and incident stroke in patients with hypertension and/or diabetes"

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In response

We sincerely thank Dr. Kawada for his interest in our study titled 'Estimated Glomerular Filtration Rate predicts Incident Stroke among Ghanaians with Diabetes and Hypertension'. Our study [1] was a sub-analysis of a prospective cohort of Ghanaians with hypertension and or diabetes [2] who had baseline creatinine measurements, $n = 2631$ out of 3296 (81.7%) for assessment of association between estimated glomerular filtration rate (eGFR) and incident stroke. Stroke incidence rates (95% CI) increased with decreasing eGFR categories of 89, 60–88, 30–59 and < 29 ml/min corresponding to stroke incidence rates of 7.58 (3.58–13.51), 14.45 (9.07–21.92), 29.43 (15.95–50.04) and 66.23 (16.85–180.20)/1000 person-years respectively.

Our correspondents first point about a dose-dependent association between eGFR and incident stroke risk and small number of events are well taken. In the published manuscript, when eGFR was analyzed as a categorical variable, only eGFR range of 30–59 ml/min was significantly associated with increased stroke risk with an adjusted hazards ratio (aHR) of 1.88 (1.17–3.02). In a *post-hoc analysis* in response to our correspondents, we found each 15 ml/min increase in eGFR was associated with reduced risk of stroke occurrence with aHR of 0.73 (0.58–0.91), $p = .005$. This suggests an inverse, dose-dependent association between renal function and stroke risk among Ghanaians with hypertension and or diabetes mellitus. In this analysis, the dose-dependent effect was observed when eGFR is specified as a continuous variable in the Cox proportional hazards regression model. Thus as renal function improves, stroke risk decreases and vice versa.

Dr. Kawada also raises a second point on the association between impaired renal function, hypertension, diabetes and occurrence of acute ischemic strokes and its outcomes by Losito [3]. There are however noteworthy differences between our study design [1,2] and those of Losito et al. [3]. As stated earlier, we sought to assess the association between renal function and incident stroke occurrence in a prospective cohort of outpatients with hypertension and or diabetes. Losito et al., on the other hand, investigated the association between acute ischemic stroke occurrence and renal function, hypertension and diabetes in a cross-section of inpatients acutely admitted to a hospital. In this regard, although associations between impaired renal function and stroke occurrence have been observed in our study [1] and that of Losito et al. [3] the contexts are slightly different. We have previously reported worse outcomes for acute stroke patients and impaired renal function among Ghanaians [4,5] amidst a rising burden of stroke admissions and poor outcomes [6–8].

The control rates of diabetes mellitus [9] and hypertension [10] among Ghanaians in out-patient clinics are not encouraging. Hence, interventions that may help improve control of these vascular risk factors such as mobile health technology to enhance adherence to medications [11,12], task-sharing strategies and provision of health insurance coverage for improved access to medications [13] among others may be instrumental in preventing end-organ damage such as renal impairment from hypertension and diabetes in Ghana.

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