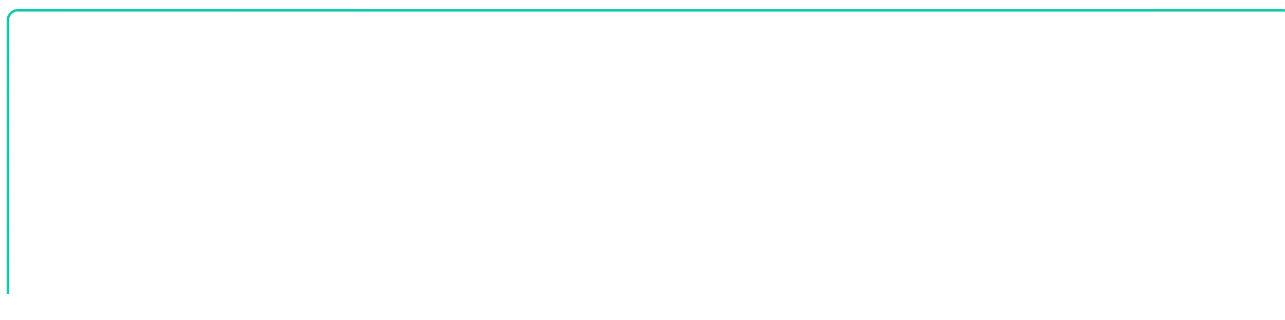


# Dietary risk factors for non-communicable diseases in Kenya: findings of the STEPS survey, 2015

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more deaths than the developed world [7]. This is despite the fact that NCDs currently receive minimal resource allocation from both governments and donor assistance relative to infectious disease [8]. In addition, most LMICs are still grappling with communicable diseases and injuries arising from violence, workplace accidents and road traffic crashes hence constituting the triple burden of disease [9].

nutrition card was used to show examples of local fruits and vegetables, with each picture representing the size of a serving (one serving).

#### New variables

We derived three new variables from the dietary part of the survey dataset on salt, sugar, fruits and vegetables intake. These included reported high dietary salt, reported high dietary sugar, and reported low intake of fruits and vegetables. Reported high dietary salt intake was defined as addition of salt at the table while eating or intake of processed foods high in salt on a daily basis. Reported high dietary sugar was defined as addition of sugar to drinks already served with sugar or intake of processed foods or drinks high in sugar on a daily basis. The information for the two new variables on sugar and salt intake was derived from the responses to the series of questions asking about amounts taken and foods high in salt or sugar. Inadequate intake of fruits and vegetables was defined as consumption of less than five servings of fruits and vegetables per day, as recommended by the WHO [19]. During the survey, intake of fruits and vegetables was gauged by asking questions on the frequency in terms of days and servings. A composite variable; unhealthy diet, made up of the three variables (high dietary salt, high dietary sugar and low intake of fruits and vege-



likely due to the fact that this was a household based survey and women are the most consistent inhabitants of the home in the Kenyan context.

Approximately one fifth of the respondents reported high dietary salt intake. This is comparable with findings from a meta-analysis of population-based studies on association between salt intake and hypertension in rural and urban communities in low and middle income countries in 2014 that found a prevalence of high salt intake of 21% to 90% [20], as well as a meta analysis of

Table 4 Determinants of overall unhealthy dietary practices (high salt, high sugar, low fruits and vegetables when present together), STEPS survey Kenya, 2015

Unhealthy diet	Adjusted odds ratio AOR (95% CI)
Age group (years)	
46–69	1.00
18–	

target under study. Lower salt intake has been associated with lower blood pressure, as well as reduced prevalence of stroke and fatal coronary heart disease in adults; these combined are the leading contributors to the current NCD burden globally [27–30]. Reduction of salt intake at population level has not been

shown to negatively impact iodine status in settings where iodized salt is applied as a strategy to reduce iodine deficiency [31]. The biggest contributor to high dietary salt intake from our study is addition of salt at the table before or during eating; this can be mitigated by sustained public education efforts on the dangers of high dietary salt intake.

High dietary sugar intake was reported by one in every seven respondents; a study in South Africa reported doubling of intake of sweetened beverages over a five-year period, from 29 to 60% [32]. However, for beverages prepared at home, our study only focused on ‘topping up’ of already sugared beverages, and this could partly explain the difference in the two studies. High dietary sugar intake is associated with several health hazards including insulin resistance and subsequently type 2 diabetes, abnormal lipids, hypertension, obesity and several other cardio-metabolic risk factors [33–35]. The observed mismatch between awareness and practice on health hazards of high dietary salt and sugar intake has been observed in other nutritional surveys in different settings, including studies by Grimes et al. in Australia [36], Nasreddine et al. in Lebanon [37] and Magalhães et al. in Angola [38]. We hypothesize that one of the explanations for this mismatch is that majority in the population lack knowledge on measures to reduce dietary sugar and salt intake, even though they are aware of the health hazards.

Only 6% of the survey respondents were consuming the minimum daily recommended five servings of fruits and vegetables. Low fruit and vegetable intakes have also been noted in other STEPS surveys whose findings have been reported to the WHO [39]. Several determinants of fruits and vegetable intake in various communities globally have been suggested, including ethnicity, cultural differences, preferences, availability and affordability [40, 41]. Overall, there is an upward trend in fruits and vegetables intake globally [42], and there are particular initiatives in Africa to promote this trend, including supporting urban fruits and vegetables farming and large-scale commercial



