Neighborhood physical food environment and cardiovascular risk factors in India: Cross-sectional evidence from APCAPS

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ABSTRACT

There has been increasing interest in associations between neighborhood food environments and cardiovascular risk factors. However, results from high-income countries remain inconsistent, and there has been limited research from low- and middle-income countries. We conducted a cross-sectional analysis of the third wave follow-up of the Andhra Pradesh children and parents study (APCAPS) (n = 5764, median age 28.8 years) in south India. We examined associations between the neighborhood availability (vendor density per km² within 400 m up to 1600 m buffers of households) and accessibility (distance from the household to the nearest vendor) of fruit/vegetable and highly processed/take-away food vendors with 11 cardiovascular risk factors, including adiposity measures, glucose-insulin, blood pressure, and lipid profile. In fully adjusted models, higher density of fruit/vegetable vendors within 400 m of participant households was associated with lower systolic blood pressure (−0.09 mmHg, 95% confidence interval (CI): −0.17, −0.02) and diastolic blood pressure (−0.10 mmHg, 95% CI: −0.17, −0.04). Higher density of highly processed/take-away food vendors within 400 m of participant households was associated with higher Body Mass Index (0.01 kg/m², 95% CI: 0.00, 0.01), waist circumference (0.22 mm, 95% CI: 0.05, 0.39), systolic blood pressure (0.03 mmHg, 95% CI: 0.01, 0.06), and diastolic blood pressure (0.03 mmHg, 95% CI: 0.01, 0.05). However, within 1600 m buffers, only association with blood pressure remained robust. No associations were found for between neighborhood accessibility and cardiovascular risk factors. Lower density of fruit/vegetable vendors, and higher density of highly processed/take-away food vendors were associated with adverse cardiovascular risk profiles. Public health policies regarding neighborhood food environments should be encouraged in south India and other rural communities in south Asia.

1. Introduction

Cardiovascular disease (CVD) is the leading cause of death and disability-adjusted life years lost worldwide, causing an estimated 17.9 million deaths in 2016 (World Health Organization, 2013). The majority of these deaths occurred in low- and middle-income countries (Murray et al., 2012), with India alone contributing almost one-fifth of the global CVD burden (GBD 2016 DALYs and HALE Collaborators, 2017).

Dietary factors are a key modifiable cause of CVD (GBD 2017 Diet Collaborators, 2019). Adequate fruit and vegetable intake is associated with reduced risk of cardiovascular diseases (hypertension, coronary heart disease, atherosclerosis, and stroke) (Nicklett and Kadell, 2013). Moreover, various cardio-protective diet patterns, such as Mediterranean diet, Nordic diet or the Dietary Approaches to Stop Hypertension diet (DASH), emphasize increasing fruit and vegetable consumption (Gibson et al., 2018; Lankinen et al., 2016; Lichtenstein et al., 2014; Salas-Salvado et al., 2016). On the other hand, highly processed and take-away food, such as sugar-sweetened beverages, packaged breads, cookies, savory snacks, candy, ice cream, breakfast cereal, pre-prepared frozen meals, and hot and cold takeaways (Monteiro et al., 2018; Moubarac et al., 2013; van der Horst et al., 2011) have been linked to...
increased obesity and cardiovascular risk (Duffey et al., 2009; Poti et al., 2017).

Food environment has been defined as “the interface that mediates one's food acquisition and consumption within the wider food system” (Turner et al., 2017). There is growing evidence from diverse settings regarding the influence of neighborhood availability and accessibility of healthy or unhealthy food on individual level risk factors (Fuentes Pacheco et al., 2018). For example, in high-income countries, a number of studies based in regions of the USA found that better access to supermarkets which mainly provide fresh food was associated with increased fruit and vegetable intake (Sharkey et al., 2010b) and reduced levels of overweight and obesity (Gamba et al., 2015). Meanwhile, better access to fast-food restaurants was associated with an increased prevalence of overweight and obesity (Chen et al., 2013). However, evidence from other countries is less consistent. For example, several UK studies have found no links between density of shops selling fruits and vegetables and fruit and vegetable consumption (Hawkesworth et al., 2017) or levels of obesity (Stafford et al., 2007). Moreover, the association between fast-food outlet availability and obesity was weak and inconsistent in one UK study (Hobbs et al., 2019). These findings suggest a need for caution when extrapolating research findings from one country to another. Several studies from low- and middle-income countries have reported no evidence of an association between access to healthy or unhealthy food vendors with overweight/obesity (Turner et al., 2019), although evidence on other cardiovascular risk factors is limited (Jaime et al., 2011; Patel et al., 2017; Velasquez-Melendez et al., 2013).

In order to inform policy for cardiovascular disease prevention in low- and middle-income countries, further evidence on the role of food environments in cardiovascular risk is urgently needed. Thus, in the present study, we investigated whether access to fruit/vegetable or healthy or unhealthy food vendors with overweight/obesity (Turner et al., 2019), although evidence on other cardiovascular risk factors is limited (Jaime et al., 2011; Patel et al., 2017; Velasquez-Melendez et al., 2013).

2. Material and methods

2.1. Study population

The Andhra Pradesh children and parents study (APCAPS) is a prospective cohort study conducted in 29 villages near the city of Hyderabad, now located in Telangana State, which has been described in detail previously (Kinra et al., 2014; Kinra et al., 2008). In brief, the index participants were children born during the time of the Hyderabad Nutrition Trial from 1987 to 1990, a controlled trial in which supplemental nutrition was offered to pregnant women and young children. They have been followed-up three times, and during the third wave of follow-up (2010−2012) their siblings and parents were also recruited (participation rate 61%). We conducted cross-sectional analysis of data from this third wave of follow-up, which collected a wide variety of data on socio-demographic characteristics, lifestyle, anthropometric measurements, and cardiovascular markers (Kinra et al., 2014).

A total of 6944 participants were included in this follow-up. We excluded 1303 (18.76%) of the participants for the following reasons: 743 with no residential geolocation available; 82 participants with self-reported coronary heart disease and stroke to avoid bias; 355 subjects with missing values on socio-demographic characteristics and lifestyle related variables. The remaining 5764 participants were included in the final analyses. Ethical approval for the study was granted by the National Institute of Nutrition, Hyderabad and the Public Health Foundation of India, New Delhi.

2.2. GPS-based measures of physical food environment

In 2016, GPS (Global Positioning System) coordinates of all shops and services selling food, tobacco or alcohol in the 29 study villages were captured. Data was collected either by observation or interviews as specified in the survey, with photographs taken of vendors’ displays for data validation. We defined two vendor typologies based on what products were sold at each shop, broadly categorized as 1) fruit and vegetable vendors (i.e. any shop selling fruit/vegetables at time of survey), and 2) highly processed and take-away food vendors (i.e. any shop selling highly processed/take-away food at time of survey). Two exposure measures for neighborhood food environment were examined, availability and accessibility. In order to be comparable with previous studies and take into consideration the local context of the present study, availability was measured in terms of the density of vendors within two buffer areas of participants’ households: 400 m, to capture availability in the immediate locality of participants’ households, and 1600 m to capture availability within the whole village (Baldock et al., 2018; Barrientos-Gutierrez et al., 2017; Murphy et al., 2017). Accessibility was measured in terms of distance from the household to the nearest vendor. The R software version 3.5.1 was used for deriving the geographical exposures.

2.3. Cardiovascular risk factors

11 cardiovascular risk factors, including adiposity measures, glucose-insulin, blood pressure, and lipid profile, were from the third wave of follow-up of APCAPS which was conducted between 2010 and 2012. A detailed description of this dataset, including anthropometry, physiological measurements, and biochemical assays, has been published previously (Kinra et al., 2014; Kinra et al., 2008). Briefly, fasting glucose, total cholesterol, triglycerides and serum high-density lipoprotein cholesterol (HDL-C) were measured using the glucose oxidase/peroxidase−4-aminophenazone-phenol enzymatic method and enzymatic calorimetric method. Insulin concentrations were estimated by radioimmunoassay in batches. Low density lipoprotein cholesterol (LDL-C) level was estimated using standard Friedewald-Fredrickson formula (Gupta et al., 2015). Blood pressure was measured in the supine position using a validated oscillometric device (Omron MS-I, Matsusaka Co., Japan). Three readings were taken and the average value was used for analysis. Height, weight and circumferences (waist and hip) were measured using standard instruments (Kinra et al., 2014). Body mass index (BMI) was calculated as weight in kilograms divided by the square of height in meters. Waist-hip-ratio was calculated as waist circumference divided by hip circumference.

2.4. Covariates

Information on sociodemographic and lifestyle factors including age (year), sex (male, female), education level (illiterate, primary school, middle school and above), occupation (unskilled, skilled, others), Standard of Living Index (low, middle, high), tobacco use (never, former, current), alcohol consumption (gram/day), and physical activity (extremely inactive, sedentary, moderately active, vigorously active) were gathered as part of a questionnaire by trained interviewers. Standard of Living Index were used to estimate the household socioeconomic status in India surveys (Ebrahim et al., 2010). Data on dietary intake (over the past year) and physical activity (over the past week) were collected by semi-quantitative questionnaires (Kinra et al., 2014).

2.5. Statistical analysis

To account for possible clustering of neighborhood physical food environment, three-level mixed-effects linear regression was used to examine the association between the densities and distances of fruit and vegetable vendors and highly processed and take-away food vendors (exposures) with cardiovascular risk factors (outcomes). Three levels used in the present study were individual level (n = 5764), household level (n = 1719), and village level (n = 29). Individuals were the primary unit of analysis, clustered within households and villages using
### 3. Results

Our final analysis consisted of 5764 participants (3329 men and 2435 women) residing in 29 villages with median age 28.8 years. Table 1 shows the densities and distances of fruit and vegetable vendors and highly processed and take-away food vendors, socio-demographic characteristics of participants, and measures of cardiovascular risk factors. The densities of food vendors within 400 m were higher than that within 1600 m.

#### 3.1. Fruit and vegetable vendors and cardiovascular risk factors

Table 2 shows associations between availability and accessibility of fruit and vegetable vendors and cardiovascular risk factors after adjustment for covariates. In fully adjusted models, a unit per km² increase in fruit and vegetable vendor density within 400 m buffer was associated with a decrease in fasting glucose \([-0.14 \text{ mg/dL}, 95\% \text{ confidence interval (CI): } -0.25, -0.03]\), systolic blood pressure (SBP) \([-0.09 \text{ mmHg}, 95\% \text{ CI: } -0.17, -0.02]\), and diastolic blood pressure (DBP) \([-0.10 \text{ mmHg}, 95\% \text{ CI: } -0.17, -0.04]\). However, the association of fruit and vegetable vendor density with other cardiovascular risk factors (insulin, BMI, waist circumference, waist-hip ratio, triglycerides, total cholesterol, HDL cholesterol, and LDL cholesterol) was weak and inconsistent, and did not persist after further adjustment for highly processed and take-away food vendor density.

#### 3.2. Highly processed and take-away food vendors and cardiovascular risk factors

Table 3 shows associations between availability and accessibility of highly processed and take-away food vendors and cardiovascular risk factors after adjustment for covariates. In fully adjusted models, a unit per km² increase in highly processed and take-away food vendor density within 400 m buffer was associated with an increase in BMI (0.01 Kg/m², 95% CI: 0.00, 0.01), waist circumference (0.22 mm, 95% CI: 0.05, 0.39), SBP (0.03 mmHg, 95% CI: 0.01, 0.06), and DBP (0.03 mmHg, 95% CI: 0.01, 0.05). Association between highly processed and take-away food vendor density with other cardiovascular risk factors (fasting glucose, insulin, waist-hip ratio, triglycerides, total cholesterol, HDL cholesterol, and LDL cholesterol) was weak and inconsistent across different models.

#### 3.3. Association between different measures of food environment and cardiovascular risk factors

Unlike the 400 m buffer, the positive effect of fruit and vegetable vendor density and negative effect of highly processed and take-away food vendor density within 1600 m buffer remained similar only in blood pressure, but not fasting glucose or BMI/waist circumference. That is, a unit per km² increase in fruit and vegetable vendor density within 1600 m buffer was associated with a 1.37 mmHg (95% CI: -2.54, -0.21) decrease in SBP and a 1.14 mmHg (95% CI: -2.11, -0.18) decrease in DBP, while a unit per km² increase in highly processed and take-away food vendor density within 1600 m buffer was associated with a 0.47 mmHg (95% CI: -0.94, 0.00) decrease in SBP and a 0.17 mmHg (95% CI: -0.39, 0.39) increase in DBP. Unlike the density measures, we found no robust associations between distance to the nearest fruit and vegetable vendor or highly processed and take-away food vendor with cardiovascular risk factors.

### 4. Discussion

This study examined how the neighborhood physical food environment was associated with cardiovascular risk factors in data from the third wave of follow-up of APCAPS. A higher density of fruit and vegetable vendors was associated with a decrease in fasting glucose and blood pressure. A higher density of highly processed and take-away food vendors was associated with an increase in BMI/waist circumference and blood pressure. There was stronger evidence for an association between cardiovascular risk factors and food vendor density within 400 m buffer than density within 1600 m buffer or the distance.

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Table 1 shows the densities and distances of fruit and vegetable vendors and highly processed and take-away food vendors.
Table 2
Association between availability and accessibility of fruit and vegetable vendors with cardiovascular risk factors in APCAPS participants.

|                      | Model 1 |          | Model 2 |          | Model 3 |          |
|----------------------|---------|----------|---------|----------|---------|----------|
|                      | β       | 95% CI   | P-value | β        | 95% CI   | P-value  |
| Glucose (mg/dL)      |         |          |         |          |         |          |
| Fruit and vegetable vendors density (units/km²) ≤ 400 m | −0.08   | −0.15, −0.01 | 0.026 | −0.09   | −0.16, −0.02 | 0.010 |
|                  | ≤ 1600 m | −0.65   | −1.79, 0.50 | 0.267 | −0.72   | −1.82, 0.38 | 0.198 |
|                  | Distance to the nearest vendor (100 m) | −0.22   | −0.81, 0.37 | 0.460 | −0.11   | −0.70, 0.48 | 0.709 |
| Insulin (Uu/ml)      |         |          |         |          |         |          |
| Fruit and vegetable vendors density (units/km²) ≤ 400 m | 0.01    | −0.02, 0.03 | 0.512 | 0.00   | −0.02, 0.02 | 0.907 |
|                  | ≤ 1600 m | 0.03    | −0.36, 0.42 | 0.885 | 0.01   | −0.38, 0.40 | 0.958 |
|                  | Distance to the nearest vendor (100 m) | −0.09   | −0.28, 0.10 | 0.355 | −0.04   | −0.23, 0.14 | 0.639 |
| BMI (Kg/m²)         |         |          |         |          |         |          |
| Fruit and vegetable vendors density (units/km²) ≤ 400 m | 0.01    | −0.00, 0.02 | 0.168 | 0.01   | −0.01, 0.02 | 0.336 |
|                  | ≤ 1600 m | 0.07    | −0.12, 0.26 | 0.454 | 0.09   | −0.10, 0.27 | 0.370 |
|                  | Distance to the nearest vendor (100 m) | −0.03   | −0.14, 0.08 | 0.611 | −0.00   | −0.11, 0.11 | 0.986 |
| Waist circumference (mm) |         |          |         |          |         |          |
| Fruit and vegetable vendors density (units/km²) ≤ 400 m | 0.40    | 0.06, 0.73 | 0.021 | 0.31   | −0.02, 0.63 | 0.062 |
|                  | ≤ 1600 m | 3.37    | −1.69, 8.43 | 0.192 | 3.71   | −1.16, 8.57 | 0.135 |
|                  | Distance to the nearest vendor (100 m) | −1.73   | −4.65, 1.20 | 0.247 | −0.90   | −3.71, 1.90 | 0.528 |
| Waist-hip-ratio     |         |          |         |          |         |          |
| Fruit and vegetable vendors density (units/km²) ≤ 400 m | 0.07    | −0.13, 0.28 | 0.470 | 0.06   | −0.14, 0.26 | 0.549 |
|                  | ≤ 1600 m | 0.18    | −3.22, 3.58 | 0.919 | −0.06   | −3.38, 3.26 | 0.970 |
|                  | Distance to the nearest vendor (100 m) | −1.20   | −2.88, 0.48 | 0.162 | −1.08   | −2.74, 0.58 | 0.203 |
| Systolic blood pressure (mmHg) |         |          |         |          |         |          |
| Fruit and vegetable vendors density (units/km²) ≤ 400 m | −0.00   | −0.05, 0.05 | 0.887 | −0.01   | −0.06, 0.04 | 0.665 |
|                  | ≤ 1600 m | −0.01   | −0.83, 0.81 | 0.972 | −0.04   | −0.85, 0.77 | 0.918 |
|                  | Distance to the nearest vendor (100 m) | −0.15   | −0.56, 0.25 | 0.461 | −0.08   | −0.48, 0.32 | 0.710 |
| Diastolic blood pressure (mmHg) |         |          |         |          |         |          |
| Fruit and vegetable vendors density (units/km²) ≤ 400 m | −0.02   | −0.06, 0.02 | 0.412 | −0.02   | −0.06, 0.02 | 0.280 |
|                  | ≤ 1600 m | −0.04   | −0.71, 0.62 | 0.900 | −0.03   | −0.69, 0.64 | 0.940 |
|                  | Distance to the nearest vendor (100 m) | −0.18   | −0.52, 0.16 | 0.295 | −0.12   | −0.46, 0.21 | 0.466 |
| Triglycerides (mmol/L) |         |          |         |          |         |          |
| Fruit and vegetable vendors density (units/km²) ≤ 400 m | 0.34    | −2.62, 3.30 | 0.823 | 0.06   | −2.92, 3.05 | 0.967 |
|                  | ≤ 1600 m | 13.44   | −29.32, 56.21 | 0.538 | 12.62   | −30.99, 56.23 | 0.571 |
|                  | Distance to the nearest vendor (100 m) | 4.50    | −22.49, 31.48 | 0.744 | 8.44   | −18.45, 35.33 | 0.538 |
| Total cholesterol (mmol/L) |         |          |         |          |         |          |
| Fruit and vegetable vendors density (units/km²) ≤ 400 m | 1.34    | −2.24, 4.93 | 0.463 | 0.87   | −2.70, 4.44 | 0.634 |
|                  | ≤ 1600 m | 22.69   | −41.42, 86.80 | 0.488 | 19.08   | −45.28, 83.45 | 0.561 |
|                  | Distance to the nearest vendor (100 m) | −19.06  | −47.95, 9.84 | 0.196 | −15.16   | −43.80, 13.49 | 0.300 |
| HDL cholesterol (mmol/L) |         |          |         |          |         |          |
| Fruit and vegetable vendors density (units/km²) ≤ 400 m | 0.83    | −0.42, 2.08 | 0.193 | 0.98   | −0.27, 2.22 | 0.124 |
|                  | ≤ 1600 m | −3.47   | −26.92, 19.97 | 0.771 | −2.60   | −25.92, 20.72 | 0.827 |
|                  | Distance to the nearest vendor (100 m) | −2.20   | −12.10, 7.71 | 0.663 | −3.13   | −13.00, 6.74 | 0.534 |
| LDL cholesterol (mmol/L) |         |          |         |          |         |          |
| Fruit and vegetable vendors density (units/km²) ≤ 400 m | 1.04    | −1.94, 4.01 | 0.494 | 0.49   | −2.46, 3.45 | 0.743 |
|                  | ≤ 1600 m | 17.51   | −34.99, 70.01 | 0.513 | 15.23   | −37.02, 67.48 | 0.568 |
|                  | Distance to the nearest vendor (100 m) | −19.26  | −43.28, 4.76 | 0.116 | −15.81 | −39.61, 8.00 | 0.193 |

Model 1 is adjusted for age, sex. Model 2 is adjusted for model 1 + education, occupation, standard of living index, tobacco, alcohol, and physical activity. Model 3 is adjusted for model 2 + densities or distances of highly processed/take-away food vendors. P < 0.05

Independent variable multiply 1000 to show more information.
vegetable vendors was inversely related to fasting glucose only, but not insulin or other obesity related outcomes (BMI, waist circumference, and waist-hip-ratio). The negative association between availability to fruit and vegetable vendors and fasting glucose may have been a chance finding due to variability in fasting glucose levels or multiple statistical testing in our study, and needs to be confirmed in further studies. We found a higher density of fruit and vegetable vendors was associated with a decrease in blood pressure. A previous study from the USA found a positive relationship between supermarket density and risk of hypertension (Tamura et al., 2018). Despite the evidence generated thus far, some ambiguity remains in the association between access to food outlets selling ready-to-eat or take-away foods and cardiovascular risk factors. Increased density of ready-to-eat food outlets and decreased distance to nearest ready-to-eat food outlet were associated with higher risk of type 2 diabetes in 347,551 UK Biobank adult participants (Sarkar et al., 2018). However,
we found no association between access to highly processed and take-away food vendors with fasting glucose or insulin, consistent with a recent systematic review that found no convincing evidence for an association between food environments and type 2 diabetes (den Braver et al., 2018). We found a positive relationship between densities of highly processed and take-away food vendors with both SBP and DBP. In a study from the USA, fast food restaurant density was not associated to blood pressure among low-income housing residents in New York City; however, the study may have lacked statistical power due to its small size (N = 102) (Tamura et al., 2018). Unlike fresh food which can be grown/produced, the highly processed and take-away food can generally be purchased through vendors only, which could limit the differences in findings between countries.

Studies have used various methods to quantify the food environment. In our study, food vendor density within 400 m buffer had a closer relationship with cardiovascular risk factors than density within 1600 m buffer and distance to the nearest food vendor. For example, we found that higher density of highly processed and take-away food vendors within 400 m buffer, but not 1600 m buffer or distance to nearest vendor, was associated with increased BMI and waist circumference. Patel et al. found that density of full service and fast food restaurants within 1000 m buffer was not related with overweight/obese in Delhi, India (Patel et al., 2017). Another study from the USA found a 10% increase in distance to the closest fast food restaurant to be associated with a 0.4% decrease in obesity (Mohamed, 2018). Cross-sectional analysis of 401,917 UK Biobank participants revealed a weak inverse association between distance from a fast-food outlet and waist circumference and BMI (AlHasan and Eberth, 2016). Relative to developed countries or even urban centres of developing countries, the commuting distances within the study villages were small, which may account for greater influence of the density of food vendors within smaller buffer zones on cardiovascular risk factors in the present study. Exploring how differences in the association vary by buffer type and distance to food vendors may be important to improving our understanding of the mechanisms by which food environment influences cardiovascular risk factors.

The different association between both availability and accessibility of different food vendors with cardiovascular risk factor in different countries may be due to various social, cultural, economic factors which affect food sale, purchasing and consumption patterns (Turner et al., 2019). A significant research gap remains to identify reasons for this heterogeneity. Comparing the results of studies which use similar methodology from a wide range of settings will be an important first step.

Some limitations of this study must be mentioned. First, the coordinates of food vendors were obtained in 2016, which was four years after the third follow-up data collection in APCAPS. However, cardiovascular risk factors such as hypertension and obesity generally develop and track over a long period of time (Mancia et al., 1993). The temporal relationship between exposure and outcome cannot be ascertained in a cross-sectional analysis; however, undiagnosed cardiovascular risk factors are unlikely to impact on the physical food environment or eating patterns. To confirm this, we conducted a sensitivity analysis excluding those with diagnosed hypertension and diabetes, and the results were largely unchanged (Table S1 and Table S2). A further limitation is that our study considered residential food environment only. People are also exposed to food environments as they go about their daily activities (e.g. during travel and at work), although we were unable to measure these exposures. This may have resulted in a dilution of the effects of food environment on cardiovascular risk factors. The data available for our research limited our ability to determine whether attributes other than density and distance, for instance the quality of resources, the average price for healthy and unhealthy food, or mobility (e.g., access to a car) (Sharkey et al., 2010a), could influence cardiovascular risk. Finally, despite controlling for a range of covariates in our analysis, there is a risk in residual and unmeasured confounding and measurement error which may bias our analyses. Future studies should also focus on various food environment measures to shed light on the causal pathways by which food environment impacts on cardiovascular risk factors.

5. Conclusion

Our study contributes to the limited body of literature from low- and middle-income countries on the effects of neighborhood availability and accessibility of healthy and unhealthy food vendors on cardiovascular risk factors. Higher density of fruit and vegetable vendors was associated with lower blood pressure, while higher density of highly processed and take-away food vendors was associated with higher blood pressure and BMI/waist circumference. Food vendor density within 400 m of participant households had a closer relationship with cardiovascular risk factors than food vendor density within 1600 m and distance to the nearest food vendor. Public health policies designed to improve the healthiness of neighborhood food environments by increasing the availability of fruit and vegetable vendors and restricting highly processed and take-away food vendors should be encouraged in South India and other rural communities in South Asia. Additional long-term longitudinal studies are needed to establish causality.

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Declaration of competing interest

The author has no conflict of interest to declare.

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