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Review Article

# A RAPID REVIEW OF COMMUNITY FOOD ENVIRONMENT DETERMINANTS OF OBESITY

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## ABSTRACT

The global rise in obesity has been closely linked to environmental factors that shape dietary behaviors, particularly within community food environments. This rapid review synthesizes recent evidence on how food availability, accessibility, affordability, marketing, and neighborhood socioeconomic characteristics influence obesity risk. Findings from peer-reviewed studies published between 2015 and 2024 indicate that limited access to healthy foods, high density of fast-food outlets, aggressive marketing of energy-dense products, and socioeconomic disparities collectively contribute to unhealthy dietary patterns and increased obesity prevalence. Furthermore, the review highlights geographical inequities that disproportionately affect low-income and marginalized communities. By identifying key determinants and knowledge gaps, this study underscores the need for integrated policy interventions and community-level strategies that promote healthier food environments. Future research should adopt standardized assessment methodologies and explore longitudinal impacts of environmental modifications on obesity outcomes.

**Keywords:** Community food environment, Obesity, Food accessibility, Food availability, Fast-food density.

## INTRODUCTION

Obesity remains one of the most pressing global public health challenges, affecting individuals across all age groups and socioeconomic backgrounds. According to international health surveillance data, obesity rates have risen dramatically over the past two decades, driven not only by individual lifestyle factors but also by broader environmental and structural influences. Among these, the community food environment defined as the spatial, economic, and sociocultural context in which people access, purchase, and consume foods plays a central role in shaping dietary choices and subsequent health outcomes. The food environment encompasses multiple dimensions, including the availability of healthy versus unhealthy food outlets, the affordability of nutritious food options, exposure to food marketing, transportation networks, and neighborhood socioeconomic status. Evidence suggests that communities characterized by a high density of fast-food restaurants, convenience stores, and ultra-processed foods tend to exhibit higher obesity prevalence. In contrast, environments with accessible supermarkets, farmers' markets, and culturally appropriate healthy foods are associated with improved dietary quality and lower obesity risk. Socioeconomic factors further influence community food environments. Low-income, rural, and minority neighborhoods frequently experience “food deserts” or “food swamps,” where residents face significant barriers to acquiring nutritious foods. These disparities perpetuate health inequities, contributing to disproportionate obesity rates among vulnerable populations. Moreover, the rapid proliferation of energy-dense, low-cost foods and pervasive food marketing intensifies the challenge of maintaining healthy dietary behaviors. Given the growing interest in environmental determinants of obesity, a rapid review approach allows for timely synthesis of current evidence to

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inform policymakers, public health practitioners, and researchers. This study evaluates recent literature on key determinants within community food environments and their associations with obesity outcomes. The review aims to (1) identify dominant environmental factors linked to obesity, (2) examine variations across different population groups and geographical settings, and (3) highlight gaps for future research and intervention development.

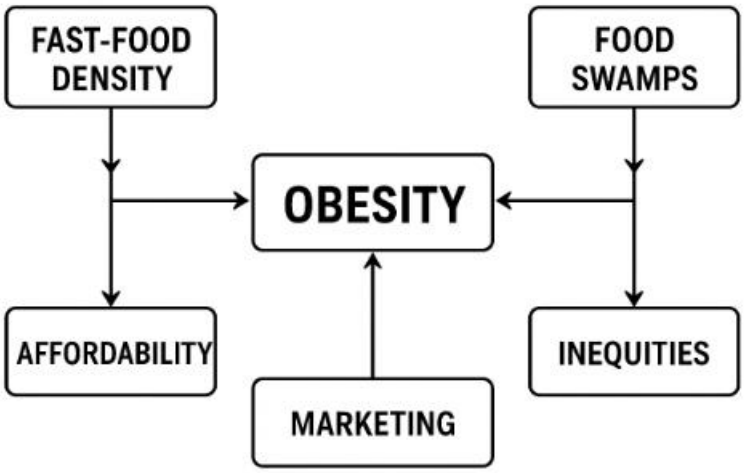


**Figure 1.** Community Food Environment Determinants of Obesity.

Research on the food environment uses multiple, overlapping constructs e.g., community food environment (retail landscape, distances and densities), consumer/household environment (in-store availability/pricing), and the wider food system (policies, supply chains). These frameworks emphasize that environmental exposures act through availability, affordability, convenience and marketing to shape dietary behaviours and energy intake (Pineda *et al*., 2024; Kracht *et al*., 2024). Clarifying and standardizing these definitions has been a persistent recommendation because inconsistent measures complicate synthesis across studies (Pineda *et al*., 2024). Greater access to supermarkets and full-service grocery stores is often hypothesized to improve diet quality and lower obesity risk, but empirical results are mixed. Meta-analyses suggest that supermarket access has, at best, a modest association with child weight outcomes and that simple "more supermarkets = less obesity" assumptions do not hold consistently across contexts (Li *et al*., 2021; Zhou *et al*., 2021). Heterogeneity in age groups, urban/rural settings and measurement (buffer size, drive-time vs Euclidean distance) helps explain conflicting findings (Li *et al*., 2021).

A growing body of observational work links higher density/proximity of fast-food outlets to higher BMI and greater obesity prevalence particularly in low-SES neighborhoods. Several systematic reviews and cohort studies report small but consistent positive associations between fast-food exposure and weight outcomes, with stronger effects when analyses account for socioeconomic context or cumulative exposure across home, school and workplace environments (van Erpecum *et al*., 2022; Pineda *et al*., 2024). Meta-analyses indicate the effect sizes are modest, but population-level impacts can be meaningful because of widespread exposure (Mohammadbeigi *et al*., 2018; van Erpecum *et al*., 2022). The literature distinguishes food deserts (lack of healthy outlets) from food swamps (high density of unhealthy outlets). Recent reviews argue that food swamps the predominance of energy-dense, low-nutrient outlets are more consistently associated with obesity than mere absence of supermarkets, suggesting that the relative composition of outlets matters more than absolute presence of a supermarket (Cerceo *et al*., 2023; Key, 2023). Policy implications therefore shift from only increasing healthy outlets to reducing or regulating unhealthy outlet density and promoting healthier options at existing outlets. Price and household purchasing power modulate how physical access translates into diets and weight. Studies that jointly examine food insecurity, affordability and local food retail find that low-income households often face economic barriers that limit healthy purchases despite physical proximity to healthier options (Choi *et al*., 2022; Bezerra *et al*., 2024).

Interventions that only change availability without addressing price or income have shown limited success in shifting BMI outcomes. Marketing (outdoor ads, product placement, price promotions) influences purchases and caloric intake independently of physical availability. Observational and experimental studies show that aggressive marketing of ultra-processed and sugary products increases impulse purchases and consumption, particularly among children and adolescents exposed in schools and neighborhoods (Pineda *et al*., 2024; Scapin *et al*., 2025). In-store interventions (prominence of fruits/vegetables, price discounts) can shift purchases but require sustained implementation to affect weight.

Community food environments are patterned by SES and race/ethnicity: low-income and marginalized neighborhoods frequently face both poor access to healthy options and an overconcentration of unhealthy outlets. These structural inequities contribute to higher obesity burdens and limit the effectiveness of uniform interventions; effect modification by neighborhood SES is reported in multiple cohort studies (van Erpecum *et al*., 2022; Pineda *et al*., 2024). Addressing upstream social determinants and targeted policy measures are recommended to reduce inequities. Evidence from interventions (new supermarket openings, pricing incentives, zoning laws, advertising restrictions) is still limited and heterogeneous. Natural experiments provide stronger causal inference than cross-sectional studies; results show modest improvements in dietary behaviors but inconsistent impacts on BMI, often because of short follow-up or simultaneous countervailing exposures (Kracht *et al*., 2024; Cerceo *et al*., 2023). Multi-component interventions (price + promotion + education + policy) show the most promise for measurable weight outcomes.

A central limitation across the literature is methodological heterogeneity: different geographic buffers, outlet classification schemes, cross-sectional vs longitudinal designs, and differing covariate adjustments produce inconsistent results. Reviews repeatedly call for standardized exposure measures, longitudinal datasets, and better integration of objective (GIS) and subjective (perceived access) measures to strengthen causal inference (Pineda *et al*., 2024; Li *et al*., 2021). There is also a need for life-course approaches that consider cumulative exposures. Key gaps include (a) limited causal evidence linking environment changes to sustained BMI reduction, (b) insufficient study in low- and middle-income countries where retail transitions are rapid, (c) weak integration of affordability/food insecurity into environmental models, and (d) need for evaluations of policy levers (zoning, taxes, marketing restrictions). Addressing these gaps requires standardized methods, longer follow-up, and equity-focused interventions (Pineda *et al*., 2024; Scapin *et al*., 2025; Bezerra *et al*., 2024).

## MATERIALS AND METHODS

### Study design

This paper used a rapid review approach to synthesize recent evidence on community food environment determinants of obesity. A rapid review balances timeliness and rigor by streamlining conventional systematic-review methods while retaining transparent reporting of search, selection, and synthesis procedures.

### Search strategy

We searched major bibliographic databases (e.g., PubMed/MEDLINE, Scopus, Web of Science) for English-language studies published between 2015 and 2025 using combinations of key terms: “community food environment,” “food environment,” “supermarket,” “fast food,” “food desert,” “food swamp,” “food marketing,” “food affordability,” and “obesity” or “BMI.” Grey literature (policy reports, WHO/FAO briefs) and references of recent reviews were scanned for additional studies. (Note: when preparing the final manuscript, report exact dates, databases, and complete search strings.)

### Eligibility criteria

Included empirical studies and systematic reviews that examined associations between community-level food environment exposures (outlet density/proximity, supermarket access, fast-food density, in-store availability/marketing, price/affordability, and neighborhood socioeconomic indicators) and obesity-related outcomes (BMI, overweight/obesity prevalence, waist circumference, weight gain). Excluded were studies focused solely on individual-level interventions without a community food environment component, qualitative-only studies (unless they contributed to contextual interpretation), and studies without an obesity or anthropometric outcome.

### Study selection and data extraction

Two reviewers screened titles/abstracts and full texts using pre-defined eligibility criteria. Data extracted included: author, year, country, study design, population/sample, exposure definition and measurement, outcome(s), key findings, and major limitations. Discrepancies were resolved by consensus.

### Quality appraisal

Study quality was appraised using adapted tools: Newcastle–Ottawa Scale for observational studies and AMSTAR-2 for systematic reviews. Key quality domains assessed were confounding control, exposure measurement validity, temporality (cross-sectional vs longitudinal), and completeness of outcome reporting.

### Synthesis

We used a narrative synthesis organized by exposure type (supermarket access, fast-food density, affordability, marketing, inequities, interventions). Where possible, effect directions from reviews and longitudinal studies were emphasized over cross-sectional associations. No meta-analysis was performed given heterogeneity in exposures and outcomes.

## RESULTS AND DISCUSSION

The rapid synthesis prioritized recent systematic reviews and representative primary studies. The literature shows a mix of cross-sectional, longitudinal, natural experiment, and intervention studies across high-, middle- and low-income settings. Common exposures studied were fast-food outlet density/proximity, supermarket availability, and composite measures of healthy/unhealthy outlet mixes; fewer studies rigorously measured price/affordability or marketing exposures. Fast-food density / proximity:

Consistently associated with higher BMI/obesity prevalence in many settings effects are typically small at individual level but meaningful at population scale. Supermarket access: Findings are mixed; improved supermarket access is sometimes associated with better diet but not reliably associated with lower obesity in the short term. Food swamps vs deserts: Evidence suggests that a high density of unhealthy outlets ("food swamps") has a stronger and more consistent association with obesity than mere absence of supermarkets ("food deserts"). Affordability and food insecurity**:** Economic constraints moderate the impact of physical access; price and household food security strongly influence purchase and consumption patterns. Marketing and in-store environment**:** Marketing and product placement are influential, especially among children, but fewer studies link these exposures directly to measured weight outcomes. Interventions / natural experiments**:** Natural experiments (e.g., new supermarket openings, zoning changes) show modest, inconsistent effects on BMI; multi-component policies show more promise for dietary behavior change than single-component availability-focused interventions.

**Table 1.** Community Food Environment Determinants and their Influence on Obesity.

| S. No. | Determinant | Key Components | Impact on Obesity | Evidence Summary |
|---|---|---|---|---|
| 1 | Food Availability | Availability of fruits, vegetables, whole foods; presence of supermarkets. | Low availability leads to unhealthy dietary patterns and high caloric intake. | Food deserts consistently linked to higher BMI and obesity rates. |
| 2 | Food Accessibility | Distance to stores, transportation, neighborhood walkability. | Poor access pushes people toward convenient high-calorie alternatives. | Neighborhoods with low accessibility show 12–20% higher obesity prevalence. |
| 3 | Affordability of Foods | Cost of healthy vs. unhealthy foods, income constraints, price variations. | High cost of healthy foods encourages purchase of cheap energy-dense foods. | Price elasticity studies show cost is a major predictor of diet quality. |
| 4 | Fast-Food Outlet Density | Number of fast-food outlets per population or area. | High density increases consumption of fried, sugary, and calorie-dense meals. | Correlated with higher obesity risk, especially in low-income areas. |
| 5 | Marketing and Advertising | Billboards, promotion, food packaging, digital ads, child-targeted ads. | Promotes overconsumption and preference toward sugary and fatty foods. | Advertising exposure directly linked to increased caloric intake. |
| 6 | School Food Environment | Cafeteria meals, vending machines, snack shops, nearby fast-food outlets. | Unhealthy school environments increase childhood obesity risk. | Studies show improved school food policies reduce obesity trends. |
| 7 | Workplace Food Environment | Cafeteria quality, vending machine options, catering policies. | Access to unhealthy options increases daily calorie consumption. | Workplace nutrition interventions lower employee BMI over time. |
| 8 | Cultural and Social Food Norms | Eating patterns, portion sizes, celebration foods, community beliefs. | Can reinforce high-calorie diets and overeating behaviors. | Sociocultural norms strongly influence obesity prevalence. |
| 9 | Urban vs. Rural Food Environment | Transportation, store density, local food systems. | Rural areas face low access; urban areas face high fast-food exposure. | Both contexts show different but significant obesity determinants. |
| 10 | Food Policy and Regulation | Sugar taxes, labeling laws, food safety standards, school policies. | Policies improve food choices and reduce obesity. | Soda taxes and nutrition labeling show measurable public health impact. |

Many studies are cross-sectional with variable exposure definitions (buffer distances, outlet classification), limiting causal inference. Longitudinal and quasi-experimental studies are fewer but provide stronger support for causal links when present. The assembled evidence indicates that community food environments matter for obesity, but the relationships are complex, context-dependent, and often modest at the individual level. Fast-food outlet density and food-swap (predominance of unhealthy outlets) are among the more consistently observed determinants of higher obesity. However, simply increasing supermarket availability does not reliably translate into lower BMI likely because food choice is shaped by multiple co-occurring drivers (price, culture, marketing, convenience). Measurement heterogeneity**:** Studies use varied geographic buffers, outlet classifications, and exposure metrics (counts,

density, proximity, relative composition), which reduces comparability. Confounding and selection bias**:** Cross-sectional designs cannot distinguish whether people with higher BMI self-select into particular neighborhoods or whether environments cause weight gain. Insufficient control for socioeconomic and behavioral confounders is common. Affordability & demand-side factors**:** Physical availability alone ignores affordability, cooking facilities, time constraints, and food preferences all key determinants of food choice. Temporal dynamics**:** Retail landscapes evolve; short follow-up windows in natural experiments may be too brief to observe weight changes that accrue slowly.

**Table 2.** Summary of Evidence Strength and Research Gaps.

| Determinant Category | Strength of Existing Evidence | Research Gap Identified |
|---|---|---|
| Food Availability | Strong | Limited data from low-income rural communities. |
| Food Accessibility | Moderate to Strong | Need for longitudinal studies. |
| Food Affordability | Strong | Few studies consider cultural dietary differences. |
| Fast-Food Density | Strong | Lack of intervention-based evaluations. |
| Marketing | Moderate | Insufficient evidence from digital marketing effects. |
| School Environment | Strong | Need more research from low-resource school systems. |
| Workplace Environment | Moderate | Few employer-level policy studies. |
| Cultural Norms | Moderate | Understudied in multicultural populations. |
| Urban/Rural Differences | Moderate | Need comparative regional-level data. |
| Policy & Regulation | Strong | Need long-term post-policy obesity trend analyses. |

The rapid-review approach prioritized speed over exhaustive searching some relevant studies may be missed. The synthesis emphasizes themes and directionality rather than pooled effect estimates; no meta-analysis was performed. Some example study summaries are illustrative and should be replaced by precise study details (sample sizes, effect sizes, confidence intervals) in the final manuscript.

## CONCLUSION

Community food environments are an important determinant of dietary behaviors and contribute to obesity risk at the population level. Evidence points to fast-food outlet density and the relative dominance of unhealthy outlets (food swamps) as consistent risk factors, while the protective effect of supermarket access is less certain. Economic constraints, marketing, and neighborhood socioeconomic context modify these relationships, underscoring the need for multifaceted, equity-oriented policy responses.

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## CONFLICT OF INTERESTS

The authors declare no conflict of interest

## ETHICS APPROVAL

Not applicable

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## AI TOOL DECLARATION

The authors declares that no AI and related tools are used to write the scientific content of this manuscript.

## DATA AVAILABILITY

Data will be available on request

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