MEDICAL LETTER

Review Article
Volume: 3
Issue: 2

Ultra-Processed Food Consumption Trends in Urban India: Drivers, Health Implications and Policy Priorities

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Received: March. 13, 2026; Revised: April. 11, 2026; Accepted: May. 21, 2026; Published: June. 30, 2026

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Abstract: India's urban food environment is undergoing a rapid transition from predominantly home-prepared meals and minimally processed staples towards a mixed dietary pattern that increasingly includes packaged snacks, sweetened beverages, biscuits, instant foods, confectionery and ready-to-eat products. Ultra-processed foods (UPFs), as defined by the NOVA classification, are industrial formulations manufactured largely from refined substances, additives and ingredients uncommon in domestic kitchens. Evidence from market sales and household-purchase datasets indicates sustained growth in the availability and purchase of UPFs in India, although their contribution to dietary energy remains lower than in many high-income countries. Urban consumption is highly unequal: a minority of households purchase substantially greater quantities, while adolescents, young adults and higher-income consumers appear particularly exposed. Convenience, aggressive marketing, small affordable packages, digital food retail, changing work patterns and perceptions of packaged foods as modern or aspirational are major drivers. International evidence consistently associates higher UPF intake with obesity, type 2 diabetes, cardiovascular disease and mortality, but Indian evidence remains predominantly cross-sectional and cannot yet establish population-specific causal effects. Debate also persists regarding whether observed harms arise from processing itself, poor nutrient composition, energy density, food structure or correlated lifestyles. Policy should therefore avoid an exclusive focus on terminology and target the measurable characteristics that make many UPFs harmful and easy to overconsume. India requires representative dietary surveillance, mandatory interpretive front-of-pack labelling, restrictions on unhealthy food marketing to children, healthier institutional food environments, fiscal measures, product reformulation and improved affordability of minimally processed foods.

Keywords: ultra-processed foods; urban India; nutrition transition; packaged foods; food environment; noncommunicable diseases.

INTRODUCTION

India is experiencing a complex nutrition transition in which persistent undernutrition and micronutrient deficiencies coexist with increasing overweight, diabetes, hypertension and cardiovascular disease. Urbanization, higher disposable incomes, greater female participation in paid work, time scarcity, food delivery platforms and the expansion of organized and online retail have altered how food is purchased and consumed. Traditional meals remain central to most Indian diets, but packaged and ready-to-consume products now occupy a growing place between and within meals.

The term **ultra-processed food** originates from the NOVA classification, which groups foods according to the nature, extent and purpose of industrial processing. UPFs are formulations produced mainly from substances extracted or derived from foods, together with additives designed to modify flavour, colour, texture, stability or convenience. Examples include carbonated beverages, packaged sweet or savoury

snacks, confectionery, industrial breads, instant noodles, reconstituted meat products, sweetened breakfast cereals and several ready-to-heat meals.[1]

Processing itself is not inherently undesirable. Pasteurization, fermentation, freezing, milling and fortification can improve safety, shelf life and nutritional value. The public health concern is directed towards products engineered for convenience, prolonged storage, intensive marketing and repeated consumption, which are often energy-dense and high in free sugars, sodium or unhealthy fats while being low in fibre and intact food structure.

India's policy debate should therefore distinguish UPFs from all packaged or processed foods. Classifying pasteurized milk, frozen vegetables, unsweetened curd and a sugar-sweetened beverage under one undifferentiated category of "processed food" would be nutritionally and epidemiologically misleading.

Trends in the Indian Market

The most comprehensive national assessment published by the WHO Country Office for India reported that the retail sales value of the UPF sector grew at a compound annual rate of approximately 13% between 2011 and 2021.[2] Sales declined briefly during the COVID-19 disruption but showed a marked recovery between 2020 and 2021. Confectionery, sweet biscuits, convenience foods, salty snacks and beverages were prominent components of the expanding market.

Market growth should not be interpreted directly as individual consumption. Retail value is affected by inflation, premiumization and changes in packaging, while sales-volume data do not capture food eaten outside the home or wastage. Nevertheless, these trends indicate increasing commercial availability and penetration of UPFs into Indian food environments.

Household panel data provide a more direct picture of purchasing. Tak and colleagues analysed purchases by 58,878 urban Indian households in 2013 and 2016. Mean annual purchase of UPFs was approximately 6.4 kg per person in 2016 and had increased by around 6% since 2013. More importantly, consumption was uneven: approximately 10% of households belonged to a high-purchasing cluster that bought more than three times the processed and ultra-processed foods purchased by the low-purchasing group.[3]

This heterogeneity has major policy implications. Urban India cannot be described simply as either a low-UPF or high-UPF population. National averages conceal rapidly emerging high-consumption subgroups whose behaviour may foreshadow wider dietary change.

What Urban Indians Are Consuming

A formative mapping study of the Indian food market identified a wide range of UPF categories, including carbonated drinks, fruit beverages, packaged biscuits, cakes, chocolates, confectionery, chips, extruded snacks, sweetened dairy products, breakfast cereals, instant noodles, spreads, sauces, ready-to-cook foods and pre-prepared meals.[4] Ingredient-list analysis demonstrated that many contained flavourings, colours, emulsifiers, sweeteners, modified starches and other markers of industrial formulation.

The boundaries are not always obvious. Traditional foods may become ultra-processed when manufactured using refined ingredients, additives and industrial formulations. Packaged idli batter containing only rice, pulses, water and salt would not necessarily be classified in the same manner as an instant breakfast mix containing refined starches, flavour enhancers and emulsifiers. Similarly, plain curd differs fundamentally from a sweetened dairy dessert despite both being sold in sealed containers.

Among South Indian young adults studied by Menon and colleagues, UPFs contributed approximately 9.3% of total energy intake. Biscuits, wafers and potato chips were among the most frequently reported products. The study did not identify a statistically significant association with anthropometric indicators, but its cross-sectional design, relatively modest intake variation and young study population limited causal inference.[5]

Another Indian adult study reported that higher energy contribution from UPFs was associated with reduced dietary quality and greater risks of inadequacy for selected micronutrients, including folate and niacin.[6] Because participants were recruited through non-probability sampling, these findings cannot be generalized to all urban Indians, but they support concern that UPFs may displace more diverse foods.

Drivers of Rising Consumption

Convenience and changing household routines

Long commutes, dual-income households, irregular work schedules and limited time for food preparation increase demand for products requiring little cooking or cleaning. Ready-to-eat products offer predictable

taste, portability and shelf life. These benefits are especially attractive to students, young professionals, migrants and households with limited kitchen facilities.
Convenience is not merely an individual preference; it is produced by urban planning, employment conditions and care responsibilities. Public health advice that asks consumers simply to "cook fresh food" may be unrealistic unless cities and workplaces make healthy meals accessible and affordable.

Affordability and small-package marketing
UPFs are often sold in small, low-priced packets that minimize the immediate financial barrier to purchase. A packet costing ₹5 or ₹10 may appear affordable even when its price per unit weight is high. Small packages also normalize frequent consumption by children and adolescents.
In contrast, fruits, nuts, dairy products and prepared healthy meals may have higher upfront costs, shorter shelf lives or greater preparation requirements. Consumer choice therefore reflects the relative price of time, convenience and storage as well as the retail price of food.

Marketing, branding and health halos
UPFs are intensively marketed through television, sports sponsorship, celebrities, digital influencers, gaming, product placement and social media. Children and adolescents are particularly vulnerable because they may not recognize persuasive intent and can influence household purchasing.
Products may be positioned as providing energy, immunity, protein, vitamins or growth despite containing substantial sugar, sodium or refined starch. Marketing can shift consumer perception from occasional indulgence to routine nutrition. WHO recommends comprehensive policies that reduce both children's exposure to, and the persuasive power of, marketing for foods high in saturated fat, trans fat, free sugars or sodium.[7]

Expansion of retail and digital food systems
Supermarkets, convenience stores and e-commerce platforms make packaged foods continuously visible. Digital retail enables targeted advertising, personalized discounts and one-click purchasing. Food delivery applications further blur the distinction between restaurant food and packaged UPFs through desserts, beverages, snacks and promotional bundles.
Online platforms can amplify unhealthy choices by ranking sponsored products prominently and using limited-time discounts. At the same time, they could support healthier purchasing if required to display nutrition warnings clearly and provide healthier default options.

Aspirational consumption
Packaged foods are frequently associated with modernity, status, convenience and global lifestyles. Rural or traditional foods may be perceived as old-fashioned, while brightly branded products symbolize urban progress. This cultural transition can occur even when consumers understand that frequent consumption may be unhealthy.

Health Implications
International observational evidence links higher UPF consumption with obesity, type 2 diabetes, cardiovascular disease, depression, some cancers and premature mortality. A large umbrella review published in 2024 found consistent associations across multiple adverse health outcomes, although the certainty of evidence ranged from low to moderate and residual confounding remained possible.[8]
The strongest experimental evidence comes from a controlled inpatient crossover trial in which participants consumed an ultra-processed or unprocessed diet matched for presented calories, macronutrients, sugar, sodium and fibre. Participants ate approximately 500 additional kilocalories per day and gained weight during the ultra-processed phase, whereas they lost weight during the unprocessed phase.[9] The trial was short and conducted in a small US sample, but it demonstrated that differences in food structure, eating rate, energy density or palatability can influence intake independently of labelled nutrient composition.
Several mechanisms may operate simultaneously. UPFs are often rapidly eaten, soft in texture, energy-dense and weakly satiating. Refined carbohydrates and liquid calories may produce rapid glycaemic exposure. High sodium, free sugar and unhealthy fat contribute directly to cardiometabolic risk. Displacement of pulses, fruit, vegetables and whole grains reduces dietary quality. Additives, packaging contaminants and alterations of the gut microbiome are under investigation, but causal evidence for individual additives at customary exposure levels remains less established.

For India, caution is required when transferring risk estimates from countries where UPFs provide 40–60% of dietary energy. Current Indian intake is generally lower, but rapid market growth and early-life exposure may produce substantial future burden. The appropriate time for prevention is before high consumption becomes normalized.

Table 1. Major UPF trends, drivers and policy responses in urban India

Domain	Current observation	Public health concern	Evidence limitation	Priority response
Retail sales	Rapid growth in sales value during 2011–2021	Increasing availability and commercial penetration	Sales value is affected by prices and does not equal intake	Monitor sales volume, household purchase and dietary intake together
Household purchasing	Average urban purchases remain moderate, but a high-purchase minority is emerging	National averages conceal vulnerable subgroups	Household data exclude food eaten outside the home	Identify high-consumption demographic and socioeconomic clusters
Common products	Biscuits, confectionery, salty snacks, sweetened beverages and instant foods are widely available	Frequent snacking and displacement of nutritious foods	Product classification may vary by formulation	Develop an India-specific UPF database and screener
Children and adolescents	High exposure to branding, small packages and digital marketing	Early formation of lifelong taste preferences	Limited nationally representative intake data	Restrict marketing and sales around schools and child-focused media
Young adults	Convenience, hostel living, employment and delivery apps encourage use	Weight gain and poor diet quality during early adulthood	Most Indian studies are cross-sectional	Conduct prospective urban cohorts and campus interventions
Nutrition claims	"Protein," "multigrain," "immunity" and vitamin claims may create health halos	Consumers may underestimate sugar, sodium or processing	Claims are not always evaluated against total nutrient profile	Restrict claims on products exceeding nutrient thresholds
Digital retail	Personalized offers and instant delivery increase accessibility	Continuous exposure and impulse purchasing	Platform data are commercially restricted	Require visible labels and transparency for sponsored rankings
Food affordability	Small packets reduce immediate purchase cost	Healthy alternatives may appear less convenient or affordable	True price comparisons rarely include satiety or nutrient value	Subsidize and improve access to fruit, pulses and healthy prepared foods
Labelling	Detailed back-of-pack information requires literacy and time	Consumers cannot rapidly identify unhealthy products	India lacks a fully implemented mandatory warning system	Introduce prominent, interpretive front-of-pack warnings
Surveillance	National surveys do not routinely quantify UPF intake	Trends and policy effects cannot be evaluated	NOVA classification requires detailed recipe and brand data	Add validated UPF measures to national nutrition surveys

Controversies and Methodological Debate

The NOVA system has been criticized because it combines products with different nutrient profiles and requires judgement regarding ingredients and processing purpose. Some fortified breakfast cereals, wholegrain breads or plant-based products may be classified as UPFs despite containing useful nutrients. Conversely, foods high in sugar, salt or saturated fat can be homemade and therefore not ultra-processed.

These criticisms are important but do not invalidate the framework. NOVA addresses a dimension not captured fully by conventional nutrient profiling: industrial formulation, food structure, convenience and commercial design. Nutrient-based and processing-based classifications should be treated as complementary rather than competing systems.

Another controversy concerns causality. People consuming more UPFs may also have lower physical activity, higher smoking prevalence, less time for cooking and other socioeconomic disadvantages. Most cohort studies adjust for measured confounders, but residual confounding cannot be eliminated.

The term may also become counterproductive if consumers are told that every packaged food is harmful. Public guidance should focus on recognisable, frequently consumed categories and encourage substitution rather than creating anxiety around unavoidable processing.

Public Health Significance

UPF growth is relevant to India's double burden of malnutrition. Energy-dense packaged foods may increase obesity while simultaneously displacing micronutrient-rich foods. Children can consume sufficient calories yet remain deficient in iron, folate, zinc or other nutrients.

The consequences are likely to be socially patterned. Higher-income urban groups may consume greater quantities of premium convenience foods, while lower-income households may increasingly rely on inexpensive biscuits, snacks and sweetened drinks. The products differ, but both pathways can reduce dietary quality.

UPFs also affect dental health, cardiovascular risk, diabetes and household expenditure. At population level, even modest increases in individual risk can create substantial healthcare costs when exposure becomes widespread.

Indian Policy Landscape

The 2024 Dietary Guidelines for Indians explicitly recommend restricting foods high in fat, salt and sugar and minimizing ultra-processed foods while increasing whole grains, millets, pulses, vegetables, fruits and nuts.[10]

This guidance is important but individual education alone is unlikely to reverse commercial trends. India requires an integrated food-environment strategy that addresses labelling, pricing, advertising, schools, procurement and digital retail.

Front-of-pack nutrition labelling remains a central policy issue. Indian experimental evidence has shown that nutrient-specific warning labels improve identification of products high in sugar, sodium and saturated fat and reduce purchase intentions more effectively than several summary formats. A mandatory warning system could counter misleading package claims and make rapid comparison easier.

School food regulations should cover not only canteens but also advertising, sponsorship, vendors near school boundaries and digital marketing. Public institutions—including hospitals, government offices and universities—should model healthier procurement.

Fiscal measures, particularly taxes on sugar-sweetened beverages, can reduce demand while generating revenue for nutrition programmes. Reformulation targets for sodium, free sugars and harmful fats should be mandatory, progressive and independently monitored.

Recent Advances

An important recent development is the creation of India-specific UPF mapping tools and consumption screeners. The 2024 formative study adapted international NOVA categories to products commonly available in India, addressing the problem that global tools may omit regionally important foods.[4] A validated brief screener could make national surveillance more feasible, although it cannot replace detailed dietary assessment.

Research is also moving towards regional analysis. Emerging studies demonstrate substantial variation in UPF availability and consumption across Indian states, age groups and social settings. This reinforces the need for local policy implementation rather than reliance only on national averages.

Digital data offer another opportunity. Anonymized supermarket, online grocery and delivery-platform transactions could provide near-real-time information on food purchasing. Governance would be required to protect privacy and prevent industry-controlled data from defining public health evidence.

Challenges and Limitations

India lacks a nationally representative dietary survey that repeatedly quantifies UPF contribution to energy intake using consistent methods. Household expenditure surveys often aggregate foods too broadly, while purchase data omit meals eaten outside the home and do not measure individual consumption.

Classification is difficult when recipes or ingredient lists are unavailable. The same named food can be homemade, minimally processed or ultra-processed depending on formulation. Researchers should document classification decisions and perform sensitivity analyses.

Health-outcome evidence from India remains limited. Cross-sectional studies cannot determine whether UPFs preceded obesity or resulted from the same lifestyle changes. Longitudinal cohorts and controlled substitution trials are required.

Commercial influence is another challenge. Food manufacturers may oppose regulation, promote voluntary labels or frame the issue as individual responsibility. Policymaking should include transparent conflict-of-interest safeguards.

Future Directions

India should incorporate a standardized UPF module into national nutrition and health surveys. Surveillance should report frequency, quantity, percentage energy contribution and socioeconomic distribution.

Prospective cohorts should study children, adolescents and young adults because dietary habits are changing most rapidly in these groups. Outcomes should include body composition, diabetes risk, blood pressure, dental health, mental wellbeing and nutrient adequacy.

Policies should prioritize substitution. Public communication should show practical alternatives: fruit or roasted pulses instead of packaged snacks; unsweetened drinks instead of sugary beverages; minimally processed breakfast options instead of confectionery-like cereals.

Urban policy must also support healthy convenience. Affordable canteens, workplace meals, safe street-food reformulation and neighbourhood access to fresh foods can reduce dependence on UPFs without requiring households to devote unrealistic time to cooking.

Finally, policy evaluation should monitor purchases, reformulation, industry responses and equity. A measure that reduces consumption among affluent households but increases prices without improving alternatives for poorer consumers may worsen disparities.

CONCLUSION

Ultra-processed food consumption in urban India is increasing, although average intake remains below levels reported in several high-income countries. The most important trend is not only the national average but the emergence of high-purchasing households and sustained commercial expansion across snacks, confectionery, beverages and convenience foods.

International evidence indicates that diets high in UPFs are associated with adverse cardiometabolic and other health outcomes. Experimental evidence supports the possibility that such foods promote excess energy intake. However, Indian evidence remains too limited to quantify long-term risk precisely, and debate continues regarding the independent effects of processing, nutrient composition and food structure.

Policy should not wait for perfect causal certainty. India already has sufficient evidence to restrict misleading marketing, introduce clear warning labels, improve school food environments, monitor digital retail and make healthy minimally processed foods more affordable and convenient.

The objective should not be the elimination of all industrially processed food. It should be to prevent heavily formulated, intensively marketed and nutritionally poor products from displacing diverse traditional meals and minimally processed foods. Acting early offers India an opportunity to avoid the much higher levels of UPF dependence now seen elsewhere.

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