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Raghav GAIHA
Nidhi KAICKER
Katsushi S. IMAI
Vani S. KULKARNI
Ganesh THAPA

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Research Institute for Economics and Business Administration
Kobe University
2-1 Rokkodai, Nada, Kobe 657-8501 JAPAN

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Has Dietary Transition Slowed Down in India: An Analysis Based on 50th, 61st and 66th Rounds of NSS[1]

Raghav Gaiha

Formerly, Faculty of Management Studies, University of Delhi

Nidhi Kaicker

School of Business, Public Policy and Social Entrepreneurship, Ambedkar University Delhi

Katsushi S. Imai

School of Social Sciences, the University of Manchester & RIEB, Kobe University

Vani S. Kulkarni

Department of Sociology, Yale University

Ganesh Thapa

International Fund for Agricultural Development, Rome

Abstract

Our study examines changes in diets over the period 1993-2009. Diets have shifted away from cereals towards higher consumption of fruits, vegetables, oils and livestock products. Using household data, a food diversity index (FDI) is constructed, based on five food commodities. Significant price effects that vary over time are confirmed, as also income/expenditure effects. Over and above these effects, more sedentary life styles and less strenuous activity patterns played a significant role in shaping dietary patterns. An important finding is slowing down of dietary transition among the poor-especially in rural areas-in the more recent sub-period 2004-09. Clues relate to weakening of food price, expenditure and life-style effects.

Key words: Diets, Demand, Prices, Income, Environment, India
JEL Codes: C23, D12, I32

*Corresponding Author:
Katsushi S. Imai (Dr)
Economics, School of Social Sciences
University of Manchester, Arthur Lewis Building,
Oxford Road, Manchester M13 9PL, UK
Phone: +44-(0)161-275-4827
Fax: +44-(0)161-275-4928
E-mail: Katsushi.Imai@manchester.ac.uk

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Has Dietary Transition Slowed Down in India: An Analysis Based on 50th, 61st and 66th Rounds of NSS

1. Introduction

India is currently undergoing a rapid economic and demographic transformation. Since 1980, average living standards have experienced a sustained and rapid rise. The gross domestic product per capita has risen by 230 per cent; a trend rate of 4 per cent annually. Life expectancy has risen from 54 years to 69 years while the (crude) birth rate has fallen from 34 to 22 per thousand between 1980 and 2008. Rapid economic growth has been accompanied by rising urbanization. Between 1980 and 2000, the share of the urban population rose from 23 to 28 per cent. By 2030, it is likely to be as high as 41 per cent.

The growth momentum was accelerated by wide ranging domestic and external liberalization of the Indian economy in the last two decades. A key feature of the economic transformation has been the change in the nature of the Indian diet. As the global markets integrate and communication becomes better, diet transitions are unavoidable. This results in a move away from traditional staples to food products that are more prevalent in western diets. These shifts are reflected in higher consumption of proteins, sugars, fats and vegetables. This dietary transition is a feature not only of India, but other Asian economies as well (Pingali and Khwaja, 2004)[2].

Some of the underlying factors of this dietary transition include expansion of the middle class, higher female participation, the emergence of nuclear two-income families, a sharp age divide in food preferences (with younger age groups more susceptible to new foods advertised in the media), and a rapid growth of supermarkets and fast-food outlets[3].

The health implications of the dietary transition are unclear. A more varied and nutritionally balanced diet and higher levels of food hygiene are associated with better health. But there is

[2] Note that some of these dietary changes are not borne out by our analysis over the period 1993-2009-especially during the more recent period 2004-09. More on these changes later.

[3] In a perceptive comment, Timmer (2010) addresses the following questions: impact of supermarkets on poor consumers, supply of staples, price stability, linkages with global markets, and health of consumers. While supermarkets offer greater consumer choice and lower prices, they consolidate the supply chain to only a few producers who are increasingly responsible for compliance with the cost, quality and safety standards. Although supermarkets are increasingly driving the food policy agenda, the state has to play a proactive role in laying down food safety standards, their compliance and in ensuring greater awareness of healthy food habits.

a trade-off as more energy-dense foods are linked to higher incidence of diet-related non-communicable diseases (NCDs) such as diabetes, coronary heart disease and certain types of cancer. Although India lags behind other developing countries in epidemiological transition — decline in infectious disease mortality compensated for increasingly by higher mortality from chronic degenerative NCDs — there is some evidence of this transition taking place. Estimated deaths from NCDs are projected to rise from 3.78 million in 1990 (40.46% of all deaths) to 7.63 million in 2020 (66.70% of all deaths). Worse, about a quarter of the deaths occurred in the 35–64 age group in urban areas areas (Kulkarni and Gaiha, 2010)[4].

In a comprehensive study, Mahal et al. (2009) demonstrate that NCDs constitute a major economic burden in India. They report high levels of out-of-pocket spending by households with members suffering from NCDs, the limited levels of insurance coverage (including subsidised public services) and the income losses that befall affected households. Associated with these costs are risks of catastrophic spending and impoverishment, and, of course, macro impacts[5].

The most recent round (66th round corresponding to the year 2009-10) of the National Sample Survey (NSS) provides new insights on the consumption and expenditure behaviour of households. Together with the 50th and 61st rounds of the NSS, the 66th round data allow analysis of changes in food consumption behaviour in the past two decades. Our analysis is based mostly on unit record data collected for these rounds of the NSS (corresponding to 1993–94, 2004–05, and 2009-10, respectively)[6].

2. Scheme

We first examine recent evidence on how prevalent eating out is and amounts spent, as these are closely linked to dietary diversification (Timmer, 2010). We then report our findings on changing dietary patterns of Indian households, based on these three rounds by the NSS. Broadly, dietary transition is characterized by a substitution of traditional staples by primary food products that are more prevalent in western diets. To capture dietary transition, we construct an index of dietary diversification and examine the trends in food diversity in rural

[4] For recent analyses, see Mahal et al. (2009) and Popkins et al. (2001).
[5] For a rigorous and innovative analysis of the overall effect of health on income, labour productivity, savings, and population effects, see Bloom et al. (2009).

[6] This analysis builds on Kaicker et al. (2011).

and urban areas over the period 1993-2009[7]. This is followed by a demand theory based analysis of the changes in the food consumption basket of the Indian household. Finally, concluding observations are made from a broad policy perspective.

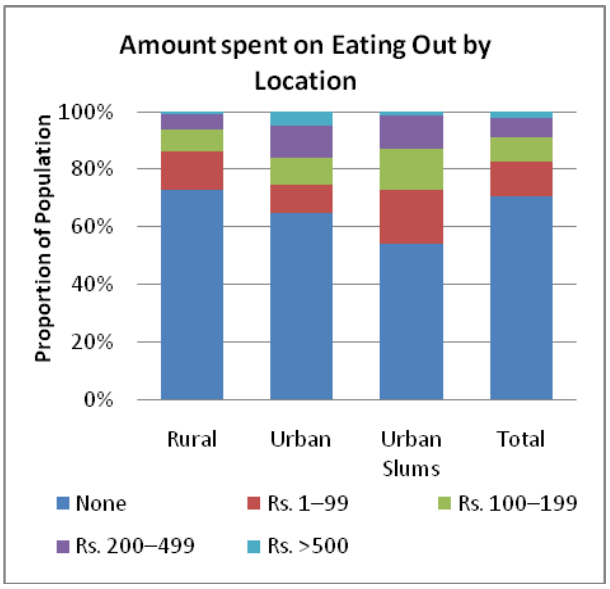
3. Eating Out

From the perspective of dietary transition as discussed above, we give below a distillation of our findings on eating out, based on an analysis of a nationwide household survey, *India Human Development Survey 2005* (IHDS), conducted jointly by the University of Maryland and the National Council of Applied Economic Research. Our focus is on the socio-economic status of households eating out, and their spatial distribution.[8] Eating out refers to meals or snacks served in restaurants, roadside eating places, tea and snack shops, and street vendors.

Eating out is pervasive going by the fact that about 30% of the households did so, as illustrated by Fig:A1 and A 2. A large majority of those eating out (about 42%) spent under Rs 99 per month, and about a quarter spent over Rs 200 per month (at 2004–05 prices) (Fig 1). Eating out is a feature not just of the metros or urban areas, but also of urban slums and rural areas, though it is less pervasive in the last two areas. In the six largest metros (Mumbai, Delhi, Kolkata, Chennai, Bangalore, and Hyderabad), about 34% of the households ate out, as compared to about 27% elsewhere. Over 47% of the former spent Rs 200 or more per month on eating out, and less than one-quarter of the latter did so. Eating out is thus more pervasive among the metro residents, who also spend larger amounts.

[7] With three data points, a robust trend cannot be established. However, some useful insights are obtained into changing consumer behavior over a period of two decades.
[8] For details, see Gaiha et al. (2010).

Fig 1: Amounts Spent on Eating Out in 2005



Source: Authors' calculations based on IHDS (2005)

About 25% of the Scheduled Castes (SCs), about 27% of the Scheduled Tribes (STs), and about 31% each of the Other Backward Castes (OBCs), and Others ate out. Even some of the most deprived and socially excluded groups — especially the SCs and STs — have switched from traditional staples to fast foods and opted for greater variety in food consumption. This is further corroborated when the sample is split into the poor and non-poor households using the official poverty line. While a much larger proportion of the non-poor households (about 32%) ate out, those among the poor (about 12.5%) were far from negligible. A more disaggregated classification of the households into four MPCE classes (less than Rs 300, between Rs 300–500, between Rs 500–1000, and greater than Rs1000) further *dispels* any doubts that eating out as a manifestation of dietary transition is mostly *a middle-class phenomenon*. About 22% of the households eating out had MPCE below Rs 500, with the majority (about 78%) from the lower and upper-middle income classes (i.e., between Rs 500–1000, and greater than Rs 1000). Within the low income households too (less than Rs 500), the share of those eating out was 18%, and 36% among the lower and upper-middle income households. Also, there are significant differences in the distribution of expenditure on eating out disaggregated by family type (i.e. whether it is a nuclear or a joint family).

Using an econometric model, we obtain additional insights into the *marginal* contribution of household traits and locational characteristics.[9] The results show that location of households, their demographic and caste characteristics and, above all, their relative affluence determine both the decision to eat out, and, conditional on it, the amounts spent. Metro and non-metro urban locations induce eating out, relative to the rural. SCs and STs have a lower propensity to eat out relative to Others, and OBCs are more likely to eat out. The higher the number of adult males and females in paid work in the age group 18 to 45 years, the greater is the likelihood of such households eating out. Over and above these effects, the higher the ratio of per capita expenditure to the poverty cut-off expenditure — as a measure of affluence — the higher is the probability of such households eating out.

Amounts spent on eating out vary with location. Households located in both metros and non-metro urban locations are likely to spend larger amounts on eating out, relative to rural areas. Between the metros and non-metros, households in the former are likely to spend much larger amounts. SCs, STs and OBCs are likely to spend lower amounts relative to Others. The higher the number of adult males in paid employment in the age-group 25 to 45, and of females in the older age-group, >45 years, the greater is the amount spent. The effect of higher per capita expenditure relative to the poverty line is large and significant, confirming that the more affluent are not just likely to eat out more often but also likely to spend larger amounts. Somewhat surprisingly, the higher the share of salary in household income, the lower is the amount spent. By contrast, the higher the share of business income, the larger is the amount spent.

Thus, our analysis broadly confirms the important role of urbanisation, demographic changes, expansion of middle class and its growing affluence in eating out, or, more generally, consumption of snacks, beverages and precooked meals. To the extent that even more deprived sections are not immune to these evolving dietary patterns, and, given their limited access to medical care and dietary awareness, the health outcomes may well be a lot grimmer than often acknowledged.

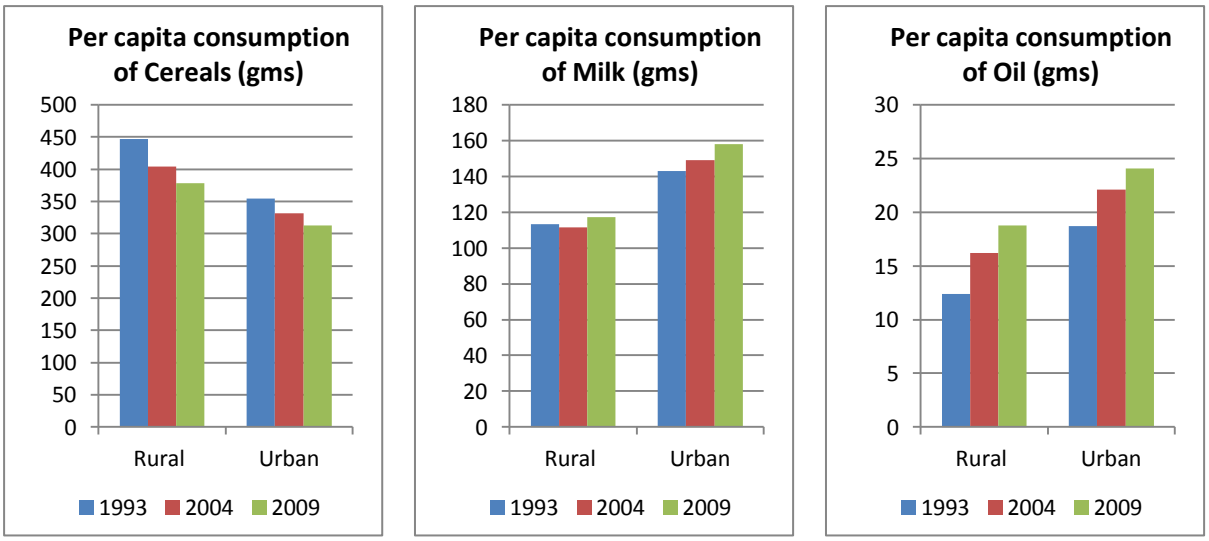
[9] We use a Heckman model in which two steps are involved: first, the probability of eating out is determined and then, conditional on it, the amounts spent on eating out. For details, see Gaiha et al. (2010 b).

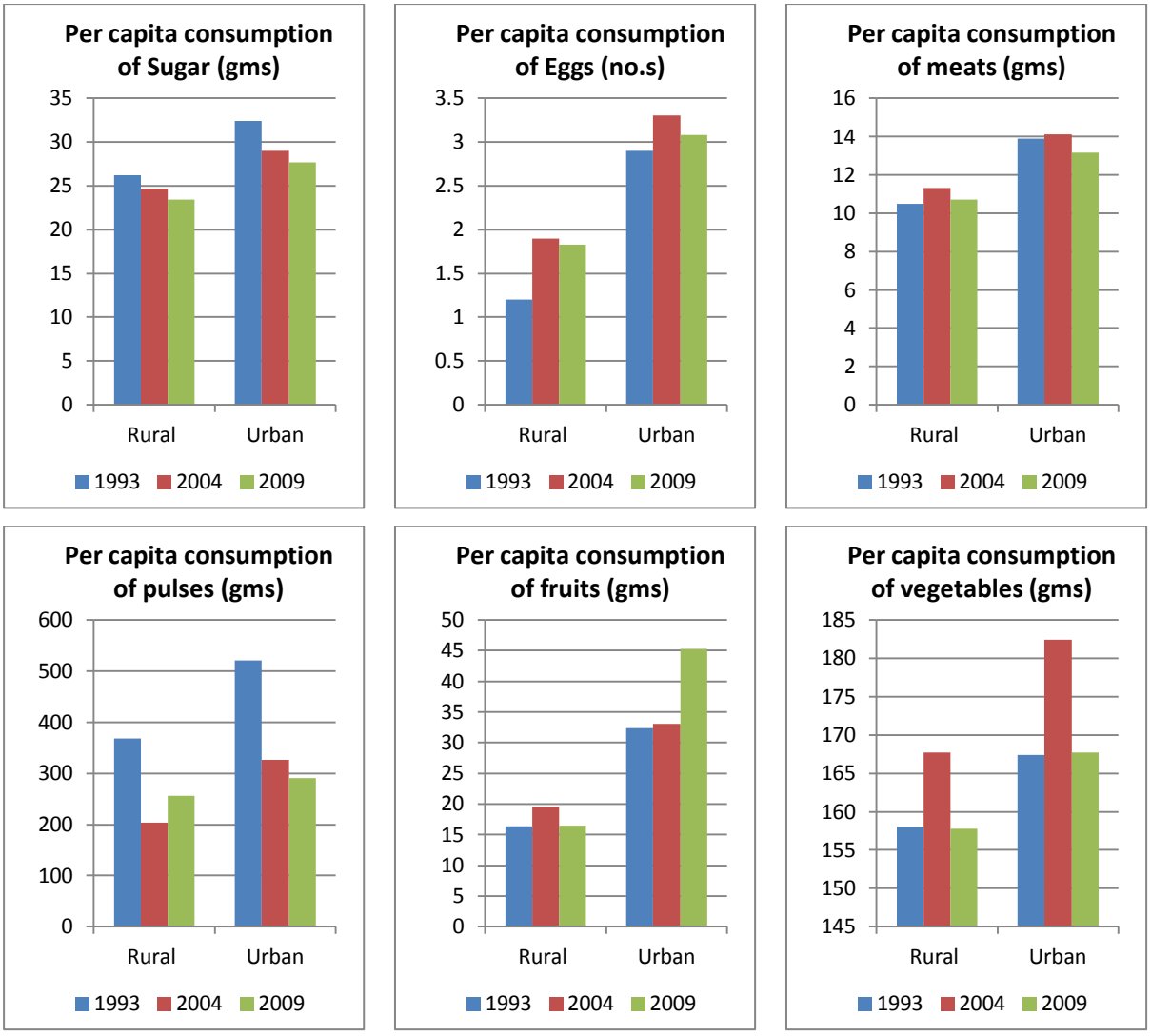
4. Changes in Diets

Let us first consider changes in consumption of various food items in rural and urban areas between 1993 and 2009. For details, refer to Table 1 in the annexure.

There was a sharp reduction in Cereal consumption between 1993 and 2009 — 15 per cent in rural areas and 12 per cent in urban areas. While the reduction was more drastic in the first period (1993-94 to 2004-05) in rural areas, as compared to the second period (2004-05 to 2009-10), in urban areas, the rate of reduction was almost equal in both the periods. In both rural and urban areas, Pulses/nuts/dry fruits recorded a sharp drop between 1993 and 2004. While it continued to decline in urban areas (although at a lesser rate), it increased substantially in the rural areas. The consumption of sugar decreased too, in both the periods and in both the sectors – rural and urban. By contrast, intakes of Vanaspati-oil rose sharply in

Figure 2: Changes in Diets (1993-2009)





both rural and urban areas, especially in the first period. The consumption of Milk and Milk products has increased, and more substantially for urban areas (by about 10 per cent between 1993 and 2009), especially in the second period. Intakes of Meat/Fish/Poultry has increased slightly in rural areas (by 2 per cent) and declined in urban areas (by 5 per cent) between 1993 – 2009. Vegetable intakes increased moderately in the first period in both rural and urban areas, but declined by an equal amount in the second, leaving the intakes largely unchanged between 1993 and 2009. Fruit consumption increased substantially in the urban areas, especially in the second period. There are substantial differences in the intakes of various food commodities among various income classes too (Refer to Table 2 in the annex)[10].

[10] For an earlier and influential analysis over the period 1983-2004, see Deaton and Dreze (2009).

Thus food composition/diet changed considerably in both rural and urban areas over the period 1993–2009.[11] The key features are a reduction in intakes of staples (cereal and pulses) and an increase in intakes of more energy dense foods, particularly fats (as seen in the increased intake of Vanaspati oil). But dietary transition slowed down in the second period (2004-05 to 2009-10) compared to the first (1993-94 to 2004-05) – as seen in the reduction in the rate of decrease in staples consumption and rate of increase in oil consumption.

As these dietary shifts are linked to intakes of calories, proteins and fats with varying importance, an investigation of how food consumption patterns changed in response to changes in income and food prices is necessary.

5. Diet Diversification

To capture diversification in diets, i.e. a move from a cereal dominated diet to more variety in food consumption basket, we use a Food Diversity Index (FDI). The FDI is calculated as the sum of squares of the shares of the various food items in the consumption basket. Algebraically,

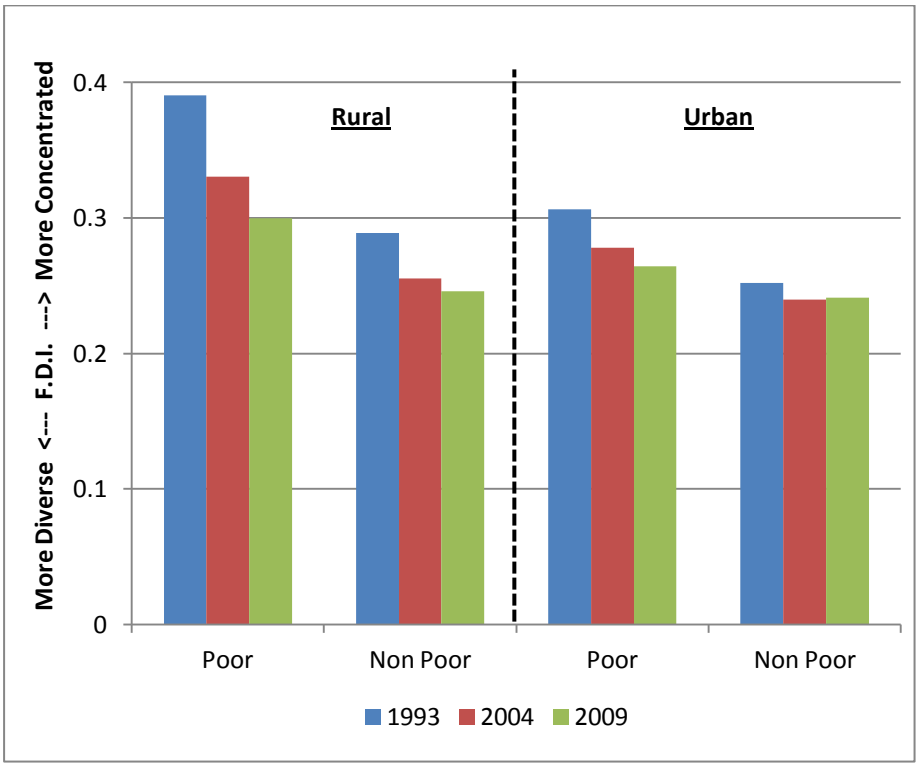
$$FDI_{it} = \sum_{j=1}^{5} S_{jit}^2 \qquad (1)$$

where FDI_{it} is the food diversity index for household i at time period t, S_{jit} is the share of jth commodity in the food consumption basket. This is similar to the Herfindahl index used to measure the competitiveness of an industry. High value of the index implies a monopolistic market (or, in our case, a more concentrated food basket) and low value implies nearly perfect competitive markets (in our case, a more diverse food basket). We use five food groups to construct the FDI: (i) Cereals and Pulses; (ii) Milk, Milk products, Eggs, and Meats; (iii) Oil; (iv) Sugar; and (iv) Fruits and Vegetables. Figure 2 shows the variation in FDI for rural and urban areas between 1993 and 2009, and for the poor and the non-poor, separately. The poor in both rural and urban areas had less diversified diets than the corresponding non-poor. For both the poor and non-poor, the food basket became more diversified (the Herfindahl index decreased) but with stark differences. In the rural areas, food diversity increased at a faster rate for the poor (15 per cent decline in the index as against 12 per cent among the non- poor) during 1993-2004. This diversification slowed down during 2004-09 among both the poor and non-poor (9 per cent and 4 per cent decline in

[11] For a rich and insightful analysis of dietary changes in India — specifically, the higher fat consumption by the bottom six per capita expenditure deciles over the period 1993–2004 — see Deolalikar (2010).

the index, respectively). The change in urban areas was slower (increase in diversity by 9 per cent for the poor and 5 per cent for the non-poor between 1993-2004). Between 2004-09, the diets of the poor continued to diversify, albeit at a slower rate (5 per cent), and somewhat surprisingly became less diversified among the non-poor.

Figure 3: Food Diversity Index (1993-2009)



6. Demand Theory Based Explanation of Changes in Diets

(a) Specification of Food Diversity Equation

We report our findings on changing dietary patterns of Indian households, based on an analysis of the 1993, 2004 and 2009 household surveys conducted by the NSS. Estimation at the household level is preferred as there is greater variation in expenditure levels than found in grouped data. A reduced form demand relation (Gaiha, 1991) is used in which the dependent variable is the Food Diversity Index (FDI), and the right side/explanatory variables include prices of food commodities, income, household characteristics, and the general environment (e.g. life-style changes, healthier environment)[12].

[12] For a rich and comprehensive exposition, see Behrman and Deolalikar (1988).

$$\mathrm{FDI_{it}} = \alpha + \boldsymbol{P_{jt}}\boldsymbol{\beta} + \gamma E_{it} + \boldsymbol{X_{it}}\boldsymbol{\delta} + \lambda_1 D1_t + \lambda_2 D2_{t+k} + \varepsilon_{it} \qquad (2)$$

where the dependent variable is the food diversity index for ith household in time t, $\mathbf{P_{jt}}$ is a vector of food prices (for the five commodity groups) computed from the NSS at the village level (j) and time t, E_{it} is household per capita expenditure for ith household in time t, $\mathbf{X}_{it}$ is a vector of household characteristics (e.g. number of adult males, females, household size) and a few others specified as dummy variables (caste and education), $D1_t$ is a dummy variable that takes the value 1 for 2004 and 0 otherwise (to allow for changes in factors other than food prices and expenditure over time), $D2_{t+k}$ is the second time dummy that takes the value 1 for 2009 and 0 otherwise, and ε_{it} is the error term.

We have pooled our sample over time (1993, 2004 and 2009) and do our analysis separately for rural and urban samples. In order to allow for differences in food diversity responses to expenditure and food prices, among other explanatory variables, we have split each sample into two sub-samples comprising the poor and non-poor. These categories are defined in terms of the poverty cut-off points[13]. Some distinctive features of the demand functions estimated are: (i) use of food commodity prices; (ii) state fixed effects to allow for unobservable state specific features impinging on food consumption patterns, over and above those explainable in terms of price and income effects (e.g. state or region-specific food preferences, say, higher demand for fish in coastal areas); (iii) household characteristics such as size, proportion of adults, education level and caste affiliation; and (iv) time- related changes such as less strenuous activity levels and healthier environments, through a time dummy.

(b) Results

The robust regression results are discussed below (Table 3-4)[14].

Comparisons between the poor and non-poor are interesting in light of the fact that the former generally consumed less diversified diets. Also, the former in urban areas consumed more diversified diets.

[13] The poverty cutoff point for rural India is Rs. 358 and for urban India Rs. 540.
[14] To avoid confusion, comparison of elasticities is in *absolute* terms if the values are negative.

Let us first examine the responsiveness of FDI among the poor in rural and urban areas. In most cases, elasticities of FDI to food price effects (in absolute terms) were higher in rural areas (e.g. cereals, oil, sugar). The effect of MPCE was higher too in rural areas, as also that of household size. But that of proportion of adults was lower in rural areas. The effects of education of adult males and females were small but slightly larger in urban areas. Over and above these effects, the effect of the time dummy was larger in rural areas in 2004. The sign of the time dummy coefficient for 2009 reverses in urban areas. It is negative in 2004 and positive in 2009, implying that the residual time effect in 2004 favoured diet diversification and reversed it in 2009. As the elasticities are small, the explanatory role of time related changes cannot wholly account for the slowing down of the diet diversification between 2004-09.

Let us now examine diet diversification responses among the poor and non-poor in rural areas. Most price responses among the non-poor were lower (cereals, milk products, oil, fruits and vegetables). Besides, the MPCE elasticity was considerably smaller. Household size and proportion of adults-especially the latter-were smaller too. While the time dummies were associated with greater diet diversification among the poor, that for 2004 had a positive effect among the non-poor and a small negative one in 2009.

The last comparison is between non-poor in rural and urban areas.

Although some of the food price effects are similar in rural and urban areas (e.g. milk and milk products, oil, sugar), an exception is the price of fruits and vegetables (higher in rural areas). MPCE increased diet diversification in rural areas but decreased it in urban areas. Higher MPCE induced diet diversification in rural areas but somewhat surprisingly not in urban areas. Household size and proportion of adults decreased diet diversification – especially the former. Education of both adult males and females decreased FDI and, by implication, increased diet diversification. The residual effect of time increased diet diversification in rural areas between 1993-2004 and 2004-2009 but at a slower rate in the latter. In the urban areas, by contrast, these effects decreased diet diversification. Among the caste groups, Others displayed more diet diversification among both the poor and non-poor in rural and urban areas relative to the STs. SCs also had more diversified diets than STs but less than Others.

The food price effects require an explanation. Higher cereal and pulse prices induce diet diversification while higher price of milk and milk products slows it down. Other food price effects are mostly negative implying lower values of FDI or greater diversification. As these are reduced form effects, the substitutions that occur and impact diet diversification cannot be captured. So while these effects may seem counterintuitive, they are not for at least two reasons: one is the aggregate classification of food commodities, and the other is that channels of transmission of food price effects are not explicitly considered. What is, however, significant is the slowing down of diet diversification-especially among the poor and non-poor in rural areas in more recent years. The clues that emerge from our analysis is that price and expenditure effects were smaller among the non-poor and among poor and non-poor in urban areas.

7. Concluding Observations

The main findings are summarised from a broad policy perspective.

Dietary shifts –a switch away from traditional staples towards food products including milk and milk products, oil, meat/fish/poultry fruits and vegetables is confirmed over the period 1993-2009. Changes in consumption baskets of the poor and non-poor between rural and urban areas and sub-periods, 1993-2004 and 2004-2009, differed. Our analysis points to the important roles of food prices, expenditure, demographic characteristics and life-style changes in diet diversification.

Two results are somewhat surprising: one is the slowing down of dietary transition in both rural and urban areas-especially in the former-over the period 2004-09. Another is that slowing down was faster among the poor than among the non-poor-especially in rural areas. In urban areas, among the non-poor, diet diversification diminished slightly in more recent years.

Our analysis offers a few clues to the slowing down of diet diversification. These relate to weaker food price, expenditure and life-style effects over time. How these are linked to changes in food preferences and taste for variety calls for a more detailed analysis than attempted here.

While concerns for poverty and hunger must dominate the policy agenda, the options for dealing with obesity and the upsurge in non-communicable diseases can only be neglected at the peril of millions of lives that may suffer their worst consequences. Although shifts in diet and physical activities are desirable in many ways—arguably varied and pleasurable—it will be a mistake to overlook the onerous nutritional health effects and the tragic but avoidable loss of well-being.

A challenge is to raise awareness of the health implications of this transition despite its slowing down in more recent years. As growing affluence, life-style changes and urbanisation are *irreversible*, the focus must shift to food safety standards and their adherence. Whether these alone will suffice is unclear as food preferences are shaped in complex ways by some of these irreversible changes.

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Annexure:

Table 1. Per Capita Consumption of Food Commodities (Gms), 1993, 2004 and 2010

Year	Cereals	Milk Products Ghee/Butter	Vanaspati-Oil	Sugar	Eggs	Meat/Fish /Poultry	Pulses/Nuts /Dry Fruits	Fruits	Vegetables
Rural India									
1993-94	446.8	113.4	12.4	26.2	1.2	10.5	368.6	16.4	158.0
2004-05	404.0	111.7	16.2	24.7	1.9	11.3	203.4	19.6	167.7
2009-10	378.2	117.3	18.7	23.5	1.8	10.7	255.7	16.5	157.8
Growth *(1993-94 to 2004-05)*	-10%	-1%	31%	-6%	58%	8%	-45%	20%	6%
(2004-05 to 2009-10)	-6%	5%	16%	-5%	-4%	-5%	26%	-16%	-6%
(1993-94 to 2009-10)	-15%	3%	51%	-10%	53%	2%	-31%	1%	0%
Urban India									
1993-94	354.7	143.0	18.7	32.4	2.9	13.9	520.8	32.4	167.4
2004-05	331.4	149.0	22.1	29.0	3.3	14.1	327.0	33.1	182.4
2009-10	312.9	157.9	24.1	27.7	3.1	13.2	290.6	45.3	167.7
Growth *(1993-94 to 2004-05)*	-7%	4%	18%	-10%	14%	1%	-37%	2%	9%
(2004-05 to 2009-10)	-6%	6%	9%	-4%	-7%	-7%	-11%	37%	-8%
(1993-94 to 2009-10)	-12%	10%	29%	-15%	6%	-5%	-44%	40%	0%

Table 2: Per Capita Consumption of Food Commodities (Gms), 2009-10 by Deciles of Monthly Per Capita Expenditure

Deciles of MPCE	Cereals	Milk Products Ghee/Butter	Vanaspati-Oil	Sugar	Eggs	Meat/Fish /Poultry	Pulses/Nuts /Dry Fruits	Fruits	Vegetables
Rural India									
1	339.1	25.4	11.2	10.9	0.7	4.0	14.4	4.5	110.6
2	354.1	41.4	14.0	15.0	1.1	5.9	17.9	7.6	132.4
3	368.4	62.4	15.2	17.3	1.3	7.0	19.4	9.2	139.3
4	371.2	78.3	16.6	19.1	1.5	8.3	19.9	10.7	148.5
5	382.2	93.9	18.3	21.4	1.6	8.7	22.1	12.5	156.5
6	380.5	111.9	19.1	23.5	1.8	10.1	23.2	15.3	159.9
7	390.7	131.1	20.6	25.7	2.1	11.7	24.6	17.0	167.5
8	391.7	159.5	21.7	28.3	2.3	12.6	27.7	21.5	171.4
9	401.8	194.5	23.6	32.6	2.4	15.3	29.8	25.1	185.6
10	402.4	275.0	27.1	40.9	3.5	23.6	36.8	41.6	205.9
Urban India									
1	314.5	50.9	14.5	16.6	1.2	5.9	17.3	7.3	115.7
2	318.3	77.7	18.1	21.2	2.0	9.7	20.9	12.4	134.8
3	315.7	100.9	20.4	23.4	2.2	10.2	22.3	15.6	141.6
4	320.3	121.1	22.4	25.4	2.6	11.2	25.3	19.9	155.2
5	322.9	136.8	23.9	27.6	2.9	12.1	28.0	22.6	158.3
6	317.2	164.6	25.2	29.6	3.1	14.0	30.2	27.4	171.8
7	315.1	183.3	27.0	30.8	3.7	14.8	33.2	33.0	176.3
8	311.7	210.6	28.6	32.6	3.5	14.7	35.7	38.8	189.7
9	307.6	241.5	29.5	33.5	4.0	17.8	37.7	48.5	203.6
10	285.6	292.2	31.6	36.8	5.6	21.1	43.1	77.8	230.5

Table 3: Robust Regression Results: Food Diversity Index (Rural India), 1993-2009

	POOR						NON POOR					
Dependent Variable: Food Diversity Index	No. of Obs. = 33126						No. of Obs. = 160651					
	F(47,33078) = 362.89						F(48,160602) = 1429.9					
	Prob. > F = 0						Prob. > F = 0					
	Coefficient			Elasticity			Coefficient			Elasticity		
Price: Cereals & Pulses	-0.183	(-12.29)	***	-0.046	(-12.29)	***	-0.058	(-18.26)	***	-0.025	(-18.26)	***
Price: Milk, Milk Products, Eggs & Meats	0.025	(12.35)	***	0.021	(12.35)	***	0.009	(19.31)	***	0.011	(19.31)	***
Price: Oil	-0.072	(-8.85)	***	-0.083	(-8.85)	***	-0.035	(-23.78)	***	-0.056	(-23.78)	***
Price: Sugar	-0.054	(-4.15)	***	-0.023	(-4.15)	***	-0.021	(-7.24)	***	-0.013	(-7.24)	***
Price: Fruits & Vegetables	-0.167	(-9.03)	***	-0.033	(-9.03)	***	-0.064	(-19.21)	***	-0.023	(-19.21)	***
Monthly per capita expenditure	-0.026	(-25.63)	***	-0.186	(-25.61)	***	-0.000	(-11.43)	***	-0.003	(-11.43)	***
Household Size	0.324	(15.83)	***	0.048	(15.82)	***	0.289	(50.99)	***	0.044	(50.98)	***
Proportion of Adults in the household	1.100	(4.5)	***	0.015	(4.5)	***	0.236	(3.86)	***	0.005	(3.86)	***
Education Dummy: Males	-0.585	(-4.73)	***	-0.004	(-4.73)	***	-0.808	(-26.95)	***	-0.013	(-26.95)	***
Education Dummy: Females	-0.186	(-1.05)	-	-0.000	(-1.05)	-	-0.413	(-12.76)	***	-0.004	(-12.76)	***
Time Dummy (2004)	-2.265	(-9.68)	***	-0.020	(-9.68)	***	-0.951	(-20.01)	***	-0.011	(-20.01)	***
Time Dummy (2009)	-0.709	(-1.51)	-	-0.003	(-1.51)	-	1.403	(15.32)	***	0.013	(15.32)	***
Caste Dummy (SC)	-0.723	(-4.64)	***	-0.005	(-4.63)	***	-1.001	(-18.27)	***	-0.005	(-18.27)	***
Caste Dummy (Others)	-1.941	(-13.85)	***	-0.027	(-13.84)	***	-1.224	(-26.4)	***	-0.026	(-26.4)	***
Constant	51.124	(55.61)	***				35.422	(279.87)	***			
***, ** and * refer to significance at the 1%, 5% and 10% level, respectively.												
State Dummies are omitted and details will be furnished on request; Education Dummy: If highest level of education is middle or lower, then dummy = 0, else=1; Omitted Time period: 1993; Omitted caste: ST												

Table 4: Robust Regression Results: Food Diversity Index (Urban India), 1993-2009

	POOR						NON POOR					
Dependent Variable: Food Diversity Index	No. of Obs. = 27853						No. of Obs. = 96638					
	F(48,27804) = 318.54						F(48,95589) = 694.51					
	Prob. > F = 0						Prob. > F = 0					
	Coefficient			Elasticity			Coefficient			Elasticity		
Price: Cereals & Pulses	-0.114	(-11.57)	***	-0.044	(-11.57)	***	-0.007	(-2.65)	***	-0.004	(-2.65)	***
Price: Milk, Milk Products, Eggs & Meats	0.017	(9.03)	***	0.018	(9.03)	***	0.010	(15.41)	***	0.012	(15.41)	***
Price: Oil	-0.050	(-9.97)	***	-0.074	(-9.97)	***	-0.029	(-20.54)	***	-0.050	(-20.54)	***
Price: Sugar	0.071	(8.63)	***	0.040	(8.63)	***	-0.016	(-5.92)	***	-0.011	(-5.92)	***
Price: Fruits & Vegetables	-0.129	(-10.85)	***	-0.040	(-10.85)	***	-0.016	(-6.04)	***	-0.008	(-6.04)	***
Monthly per capita expenditure	-0.014	(-28.12)	***	-0.166	(-28.11)	***	0.000	(14.33)	***	0.005	(14.33)	***
Household Size	0.228	(13.67)	***	0.038	(13.67)	***	0.189	(31.2)	***	0.027	(31.2)	***
Proportion of Adults in the household	1.266	(6.84)	***	0.022	(6.84)	***	0.075	(1.32)	-	0.002	(1.32)	-
Education Dummy: Males	-0.470	(-5.3)	***	-0.006	(-5.3)	***	-0.403	(-13.24)	***	-0.010	(-13.24)	***
Education Dummy: Females	-0.240	(-2.34)	**	-0.002	(-2.34)	**	-0.026	(-0.94)	-	-0.001	(-0.94)	-
Time Dummy (2004)	-1.121	(-7.77)	***	-0.013	(-7.77)	***	0.437	(10.37)	***	0.005	(10.37)	***
Time Dummy (2009)	0.285	(1.02)	-	0.002	(1.02)	-	2.057	(25.02)	***	0.022	(25.02)	***
Caste Dummy (SC)	-0.804	(-4.32)	***	-0.005	(-4.32)	***	-0.744	(-10.35)	***	-0.003	(-10.35)	***
Caste Dummy (Others)	-1.590	(-9.18)	***	-0.033	(-9.18)	***	-0.725	(-11.37)	***	-0.020	(-11.37)	***
Constant	42.525	(78.93)	***				31.684	(250.11)	***			
***, ** and * refer to significance at the 1%, 5% and 10% level, respectively.												
State Dummies are omitted and details will be furnished on request; Education Dummy: If highest level of education is middle or lower, then dummy = 0, else=1; Omitted Time period: 1993; Omitted caste: ST												

Fig A1: Distribution of Households Eating Out

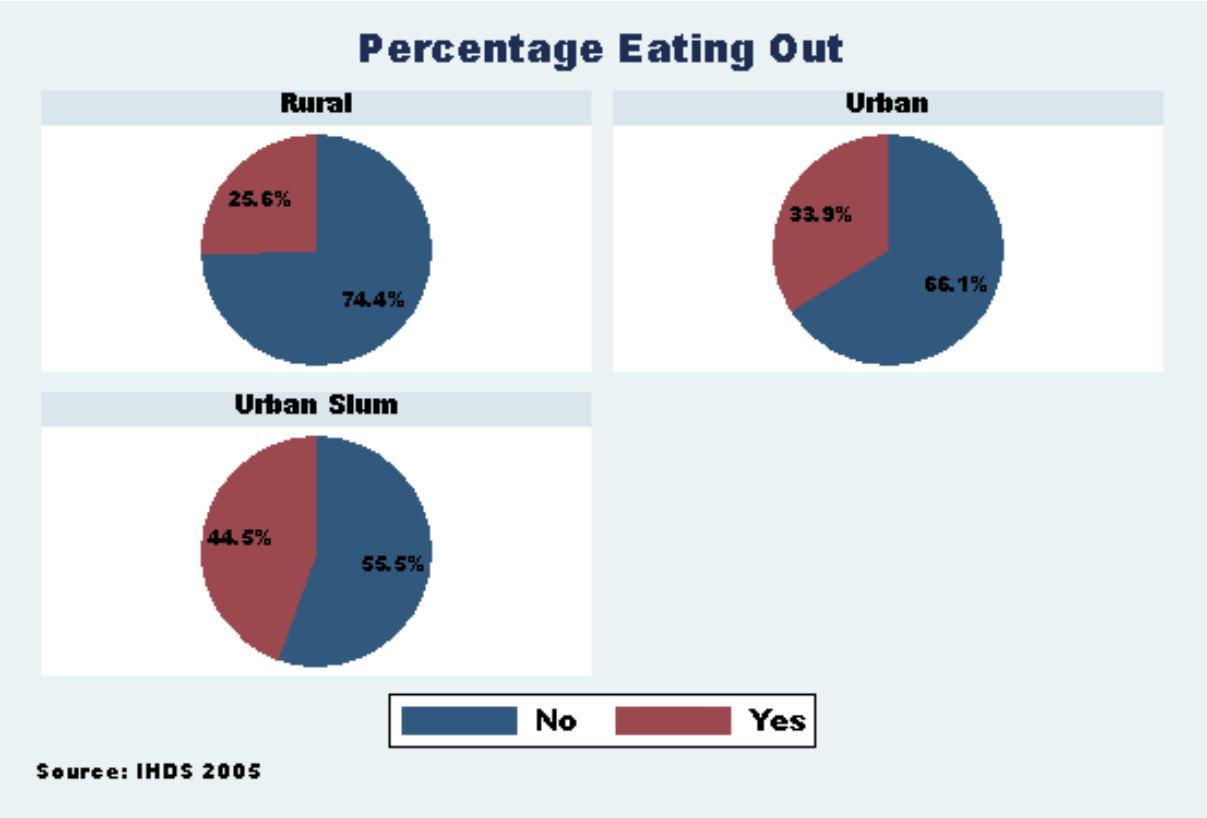
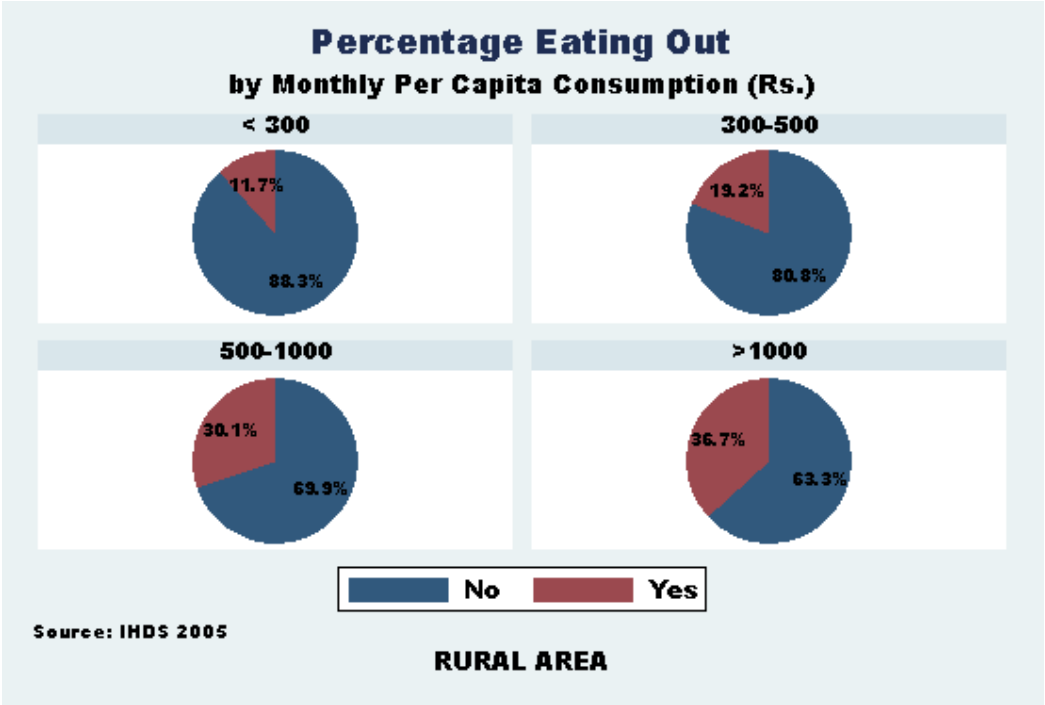
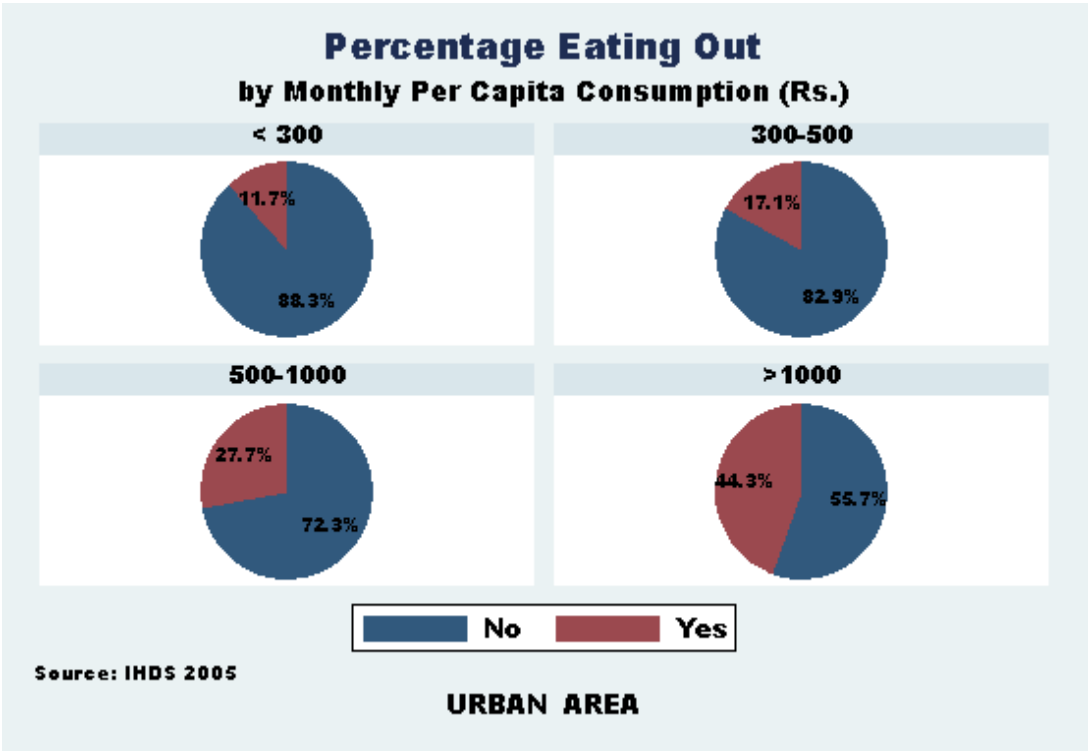


Fig A 2: Distribution of Households Eating Out by MPCE (Rs)

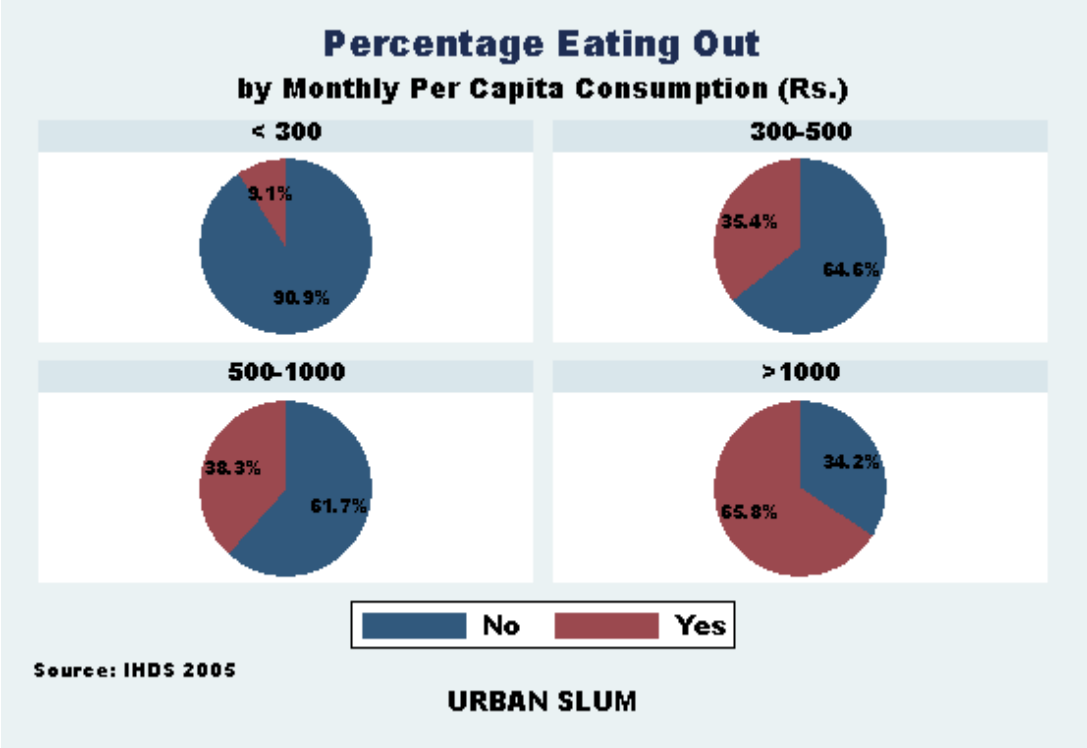
(a) Rural



(b) Urban



(c) Urban Slums



(d) Aggregate