How Pervasive is Eating Out in India?

Raghav Gaiha,
Faculty of Management Studies,
University of Delhi,

Raghbendra Jha,
Arndt-Corden Division of Economics
Research School of Pacific and Asian Studies
Australian National University,

&

Vani S. Kulkarni,
Centre of South Asian Studies,
Yale University.

November 2009

How Pervasive is Eating Out in India?

Abstract

A key feature of the economic transformation has been the change in the nature of the Indian diet. As global markets integrate and communication becomes better, diet transitions are unavoidable. There is a move away from inferior to superior foods and a substitution of traditional staples by primary food products that are more prevalent in western diets. These shifts are reflected in higher consumption of proteins, sugars, fats and vegetables. As part of this dietary transition, our analysis focuses on the pervasiveness of eating out. The analysis, based on a rich household survey for 2005, conducted jointly by University of Maryland and National Council of Applied Economic Research, 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, precooked meals and beverages. To the extent that even more deprived sections-not just in metros but also in rural areas-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 grim.

How Pervasive is Eating Out in India?[1]

Dietary Transition

India is 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 rose by 230 per cent — a trend rate of 4 per cent annually. Poverty declined at an annual rate of 0.88 per cent during 1983–94 and at a slightly lower rate of 0.77 per cent during 1993–05. Life expectancy has risen from 54 years to 69 years while the (crude) birth rate has fallen from 34 to 22 over the period 1980–2008. Rapid economic growth has been accompanied by rising urbanisation. Between 1980–2000, the share of the urban population rose from 23 per cent 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 liberalisation of the Indian economy in the 1990s. 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. There is a move away from inferior to superior foods and a substitution of traditional staples by primary food products that are more prevalent in western diets. These shifts are reflected in higher consumption of proteins, sugars, fats and vegetables.

Some of the underlying factors include expansion of the middle class, higher female participation, 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 super markets and fast-food outlets.

Some dietary changes observed since the 1980s (based on FAOSTAT[2]) are delineated below:
- During the 1980s, consumption of both animal and vegetable products rose sharply.
- Among animal products, the largest proportional increase was in the consumption of milk.
- Among vegetable products, there were large increases in rice, pulses, wheat, spices and oils.

During the 1990s, the pattern of food consumption changed significantly.

- There was a marked increase in the consumption of animal products — especially animal fats — but a relatively modest increase in that of vegetable products.
- Among the latter, there were large increases in the consumption of wheat, starchy roots, vegetable oils, sugar and sweeteners, and fruits while that of rice, pulses and other cereals declined.
- Among the starchy roots, potato recorded a sharp increase given its salience in energy-dense food products (e.g. fries and potato chips).
- Use of wheat has changed too, as there is a move away from the traditional *chapatti* to more commercialised and westernised bread products.

The health implications of the dietary transition are not clear-cut. A more varied and nutritionally balanced diet and higher levels of food hygiene are associated with better health. But there is a trade-off as more energy-dense foods are linked to a higher incidence of diet-related non-communicable diseases or NCDs (e.g. diabetes, coronary heart disease and certain types of cancer).[3] Although India lags behind other developing countries in the 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.[4] The estimated deaths from NCDs are projected to rise from 3.78 million in 1990 (40.46 per cent of all deaths) to 7.63 million in 2020 (66.70 per cent of all deaths).[5] Worse, many of these deaths occur at relatively early ages. About a quarter of the deaths occurred in the 35 to 64 age-group in urban areas.

Data

From this perspective, we report our findings on eating out, based on an analysis of a nationwide household survey, *India Human Development Survey 2005 (IHDS)*, conducted jointly by University of Maryland and National Council of Applied Economic Research (NCAER).

IHDS covers over 41000 households residing in rural and urban areas, selected from 33 states.[6] The sample comprises 384 districts out of a total of 593 identified in 2001 census. Villages and urban blocks constituted the primary sampling unit from which households were selected.

The rural sample contains about half the households that were interviewed initially by NCAER in 1993–94 in a survey entitled Human Development Profile of India-HDPI-and the other half of the sample households was drawn from both districts surveyed in HDPI as well as from districts located in the states and union territories not covered in HDPI. The original HDIP was a random sample of 33,230 households, located in 16 major states, 195 districts and 1765 villages. In states where the 1993–94 survey was

---

[3] For an admirably lucid exposition of growth of supermarkets and fast food outlets, and shifts in dietary patterns, see Timmer (2009).
[4] For an important contribution, see Popkin et al. (2001).
[5] Cited in Reddy et al. (2005).For a more recent assessment, see Mahal et al. (2009).
[6] This is a summary of the material provided by Sonal Desai.

conducted and recontact details were available, 13593 households were randomly selected for reinterview in 2005. About 82 per cent of the households were contactable for reinterview resulting in a resurvey of 11,153 original households as well as 2,440 households which had separated from the original households but were still living in the same village.

In each district where reinterviews were conducted, two fresh villages were randomly selected using a probability proportional to size technique. In each village, 20 randomly selected households were selected.

Additionally, 3,993 households were randomly selected from the states where the 1993–94 survey was not conducted, or where recontact information was not available.

In order to draw a random sample of urban households, all urban areas in a state were listed in the order of their size with number of blocks drawn from each urban area allocated based on probability proportional to size. After determining the number of blocks, the enumeration blocks were selected randomly. From these enumeration blocks (of about 150—200 households), a complete household listing was obtained and a sample of 15 households was selected per block.

Comparison of IHDS data with the National Sample Survey or NSS (2004–05), National Family Health Survey III (2005–06) and Census (2001) confirms the robustness of IHDS data. For example, IHDS sample distribution on urban residence, caste and religion is remarkably similar to NSS and NFHS-III, although all three surveys (IHDS, NSS and NFHS) have higher proportions of households claiming Scheduled Caste status than enumerated in Census (2001).

Cross-Tabulations

Our focus is on the socio-economic status of households eating out, and their spatial distribution. The latter disaggregates household locations into rural and urban areas, and urban slums. A further disaggregation separates 6 metros from the rest. Eating out refers to meals or snacks served in restaurants, roadside eating places, tea and snack shops, and food vendors. Three sets of cross-tabulations are given below: the first focuses on location (rural, urban, urban slums, metros); the second on socio-economic characteristics of those eating out; and the third on amounts spent.

(a) Location

Tables 1 and 2 give the distribution of households eating out by location. In these and subsequent tables, two different types of locational classification are used: the first distinguishes metros, non-metro urban and (non-metro) rural areas; and the second distinguishes rural, urban and urban slums. As illustrated below, eating out is not just a feature of metros or urban areas but also of urban slums and rural areas. Admittedly, although it is less pervasive in urban slums and rural areas, it is non-negligible. Nor is eating out a feature of affluent households only, as it is not uncommon among the poor and other deprived sections.

Table 1
Distribution of Households Eating Out by Location[7]

| Location | Whether Ate Out? | | Total |
	No	Yes (percentage)	
Non-metro Rural	74.67 (65.40)	25.33 (56.67)	100 (62.94)
Metro	65.54 (9.08)	34.46 (12.19)	100 (9.95)
Non-Metro Urban	67.67 (25.52)	32.33 (31.14)	100 (27.10)
Total	71.86 (100)	28.14 (100)	100 (100)

The proportion of households eating out is well above one quarter. The highest proportion is found in the six metros, followed by non-metro urban, and rural area.[8] The differences, however, are small. The differences among the metros are large, with over three-fourths of the households in Bangalore eating out, followed by Chennai, and then Mumbai. At the other extreme are Kolkatta (20.13 per cent) and Delhi (about 25 per cent). Another locational classification further corroborates the pervasiveness of eating out. Somewhat surprisingly, the proportion of households eating out was highest in urban slums (45.9 per cent), followed by urban areas (35.2 per cent) and then rural areas (27.29 per cent).

Table 2
Distribution of Households Eating Out in Metros

| Metro | Whether Ate Out? | | Total |
	No	Yes (Percentage)	
Mumbai	61.88 (18.31)	38.12 (22.55)	100 (19.73)
Delhi	75.11 (21.06)	24.89 (13.95)	100 (18.68)
Kolkata	79.87 (38.04)	20.13 (19.16)	100 (31.74)
Chennai	47.84 (8.17)	52.16 (17.81)	100 (11.39)
Bangalore	24.17 (1.90)	75.83 (11.93)	100 (5.25)
Hyderabad	63.18 (12.52)	36.82 (14.59)	100 (13.21)
Total	66.66 (100)	33.34 (100)	100 (100)

---

[7] Figures in parenthesis indicate percentage of total respondents in that category. Thus, 65.40 % of all households that did not eat out lived in non-metro rural areas.
[8] The six metros are Bangalore, Kolkatta, Chennai, Delhi, Mumbai and Hyderabad.

As economic deprivation is highest among the STs, followed by the SCs and then OBCs, the cross-classification of households affiliated to these groups by whether they ate out is revealing.[9] The proportion eating out was highest among the STs, followed by the OBCs and then Others. So the convenience and cheapness of eating out are presumably inducing relatively deprived households and/or those living in deprived areas to turn to this option in large numbers. As may be noted from subsequent cross-tabulations of eating out by poverty status, we find some striking differences[10]. In the metros, the proportion of non-poor eating out is more than five times higher than that of poor (36.73 per cent and 7.38 per cent, respectively). So clearly the relatively affluent display a stronger propensity to eat out. However, while it is not surprising that the proportion of non-poor eating out in non-metros is markedly lower (31.30 per cent), that of poor is higher (13.84 per cent). As we are unable to probe the quality and price differences, these may be key to the narrower gap between proportions of non-poor and poor eating out in non-metros.

Table 3
Distribution of Households Eating Out by Caste

Caste	Whether Ate Out?		Total
	No	Yes (percentage)	
Scheduled Caste (SC)	75.57 (22.14)	24.43 (17.0)	100 (20.61)
Scheduled Tribe (ST)	71.46 (7.39)	28.54 (7.0)	100 (7.28)
Other Backward Castes (OBC)	68.22 (34.97)	31.78 (38.61)	100 (36.06)
Others	69.26 (35.50)	30.74 (37.39)	100 (36.05)
Total	70.35 (100)	29.65 (100)	100 (100)

Whether the decision to eat out is linked to the family type — nuclear or joint — is sought to be captured in the cross-tabulation in Table 4.[11] About 28 per cent of nuclear families ate out as compared with a slightly higher share of joint families. The corresponding proportion of the residual group was considerably lower (over 19 per cent). Among those who ate out, more than 50 per cent belonged to nuclear families and a little under half to joint families. If joint families displayed a stronger propensity to eat out, it could be in part a manifestation of diverse living arrangements (e.g. some relatives may simply live under the same roof but may not share meals).

---

[9] For details, see Gaiha et al. (2008).

[10] The poverty line used is the official poverty line in terms of monthly per capita expenditure. For details, see Himanshu (2007).

[11] A nuclear family is one that includes a married couple, with or without both spouses living together, and their children, if any. A joint family includes other relatives. Other cases (e.g. a widow/widower or a separated spouse living alone) are combined in the residual group.

Table 4
Distribution of Households Eating Out by Family Type

Family Type	No	Whether Ate Out? Yes (percentage)	Total
Nuclear	72.16 (53.03)	27.84 (52.43)	100 (52.86)
Joint	69.88 (38.17)	30.12 (42.16)	100 (39.29)
Other	80.63 (8.81)	19.37 (5.42)	100 (7.86)
Total	71.93 (100)	28.07 (100)	100 (100)

Let us now turn to cross-tabulations of expenditure on eating out and socio-economic status of households.

In Table 5, a cross-tabulation of eating out (monthly) expenditure by monthly (household) per capita expenditure is given. Note that the poverty cut-off point for the major states lie in the monthly per capita expenditure range — Rs 300–500. So those in the lower range may be described as acutely or extremely poor while those in the range >Rs 1000 as relatively affluent. To contrast these results with those from the sample of households living in the metros, a cross-tabulation for the latter is given in Table 6.

Table 5
Distribution of Household Expenditure on Eating Out
by monthly per capita expenditure (MPCE)(Rs)

Eating Out (Rs)	<300	300–500	500–1000	>1000	Total
None	12.82 (87.52)	28.71 (79.19)	38.40 (68.20)	20.07 (57.44)	100 (70.35)
1–99	8.57 (10.37)	27.55 (13.47)	44.84 (14.12)	19.03 (9.66)	100 (12.47)
100–199	2.24 (1.85)	16.87 (5.61)	49.04 (10.50)	31.85 (10.99)	100 (8.48)
200–499	0.39 (0.25)	6.18 (1.59)	37.71 (6.25)	55.72 (14.89)	100 (6.57)
>500	0.10 (0.02)	1.69 (0.14)	17.14 (0.92)	81.08 (7.03)	100 (2.13)
Total	10.30 (100)	25.51 (100)	39.61 (100)	24.58 (100)	100 (100)

One striking feature is that the proportion of households eating out rises among the three lowest expenditure ranges and then falls sharply in the highest range (>Rs 1000). Another striking result is that amounts spent vary in a somewhat complex fashion. If we consider those in extreme or moderate poverty (i.e. the first two monthly expenditure ranges), small or moderately high fractions of households spending small amounts on eating out fall sharply. In the intermediate range of monthly expenditure (Rs 500–1000), the proportions spending small to moderate amounts is higher and a non-negligible proportion spends more than moderate amounts on eating out. In the highest expenditure range or among the relatively affluent (i.e. with a monthly per capita expenditure>Rs 1000), there is a clear progression of proportions spending larger amounts on eating out except in the highest range of eating out expenditure (>Rs 500). But even in this cell, the share of the relatively affluent is non-negligible (about 7 per cent). So the upshot is that relatively affluent are more likely to eat out, as also to spend larger amounts.

Table 6
Distribution of Household Expenditure on Eating Out
by monthly per capita expenditure (MPCE)(Rs)
in Metros

Eating Out (Rs)	<300	300–500	500–1000	>1000	Total
None	3.91 (95.12)	17.93 (86.24)	43.62 (71.75)	34.54 (53.70)	100 (66.66)
1–99	1.65 (4.18)	13.35 (6.66)	45.47 (7.76)	39.53 (6.38)	100 (6.91)
100–199	0.18 (0.71)	6.64 (5.09)	51.55 (13.51)	41.63 (!0.31)	100 (10.62)
200–499	0.0 (0.0)	2.66 (2.01)	24.58 (6.37)	72.77 (17.81)	100 (10.50)
>500	0.0 (0.0)	0.0 (0.0)	4.72 (0.62)	95.28 (11.79)	100 (5.31)
Total	2.74 (100)	13.86 (100)	40.53 (100)	42.87 (100)	100 (100)

This comes out more sharply in the sub-sample for the metros in Table 6. Among the relatively affluent, for example, the proportion spending larger amounts on eating out rises from over 6 per cent to about 18 per cent but falls to about 12 per cent in the highest eating out expenditure range (i.e. >Rs 500).

To avoid cluttering the text, and to throw more light on the differences between the poor and non-poor, let us first consider the sub-sample for the metros in Table 7. While the proportion spending larger amounts on eating out decreases sharply among the poor, there is a progression among the non-poor except in the highest range of eating out expenditure. In the non-metro sub-sample, however, while the proportion of poor spending larger amounts drops sharply, it also falls among the non-poor but more slowly.

As monthly per capita expenditure is only a proxy for the standard of living, it is worthwhile to examine linkages between eating out and castes — some of which are highly poverty prone. Two cross-tabulations are given below: one for the sub-sample for the metros and another for the non-metros. Two remarks are in order.

Table 7
Distribution of Household Expenditure on Eating Out by Poverty Status in Metros

Eating Out (Rs)	Non-Poor	Poor	Total
None	83.96 (63.27)	16.04 (92.62)	100 (66.66)
1–99	92.22 (7.21)	7.78 (4.66)	100 (6.91)
100–199	98.27 (11.80)	1.73 (1.59)	100 (10.62)
200–499	99.08 (11.76)	0.92 (0.84)	100 (10.50)
>500	99.36 (5.96)	0.64 (0.29)	100 (5.31)
Total	88.46 (100)	11.54 (100)	100 (100)

Table 8
Distribution of Household Expenditure on Eating Out by Poverty Status in Non-Metros

Eating Out (Rs)	Non-Poor	Poor	Total
None	73.66 (68.70)	26.34 (86.16)	100 (72.57)
1–99	83.55 (14.67)	16.65 (10.29)	100 (13.69)
100–199	91.56 (8.71)	8.44 (2.81)	100 (7.40)
200–499	96.93 (6.37)	3.07 (0.71)	100 (1.22)
>500	99.26 (1.56)	0.74 (0.04)	100 (1.22)
Total	77.81 (100)	22.19 (100)	100 (100)

One is that proportions of those eating out are not higher in all cases in the metros. While those of the SCs and OBCs are higher in the metros — especially of the latter — that of the STs is much higher in the non-metros. The second remark is that the amounts spent by each of these deprived groups — with varying degrees of deprivation — are higher in the metros. So it follows that even relatively deprived groups are not immune to changing life styles and dietary changes.

Table 9
Distribution of Household Expenditure on Eating Out by Caste in Metros

Eating Out (Rs)	SC	ST	OBC	Others	Total
None	26.59 (73.21)	1.64 (82.09)	25.14 (60.79)	46.63 (66.29)	100 (66.29)
1–99	25.95 (7.41)	0.28 (1.46)	32.10 (8.05)	41.67 (6.14)	100 (6.91)
100–199	24.62 (10.80)	0.96 (7.66)	39.62 (15.27)	34.80 (7.88)	100 (10.62)
200–499	16.20 (7.02)	0.47 (3.67)	31.20 (11.88)	52.13 (11.67)	100 (10.50)
>500	7.12 (1.56)	1.29 (5.13)	20.80 (4.0)	70.80 (8.01)	100
Total	24.21 (100)	1.33 (100)	27.56 (100)	46.89 (100)	100 (100)

Table 10
Distribution of Household Expenditure on Eating Out by Caste in Non-Metros

Eating Out (Rs)	SC	ST	OBC	Others	Total
None	22.96 (76.82)	8.65 (72.84)	35.83 (70.82)	32.56 (71.65)	100 (72.57)
1–99	21.33 (13.46)	11.15 (17.72)	40.59 (15.14)	26.93 (11.18)	100 (13.69)
100–199	17.07 (5.82)	6.94 (5.96)	40.41 (8.15)	35.58 (7.99)	100 (7.40)
200–499	14.05 (3.31)	4.33 (2.57)	34.90 (4.86)	46.72 (7.24)	100 (5.11)
>500	10.26 (0.58)	6.41 (0.91)	31.00 (1.03)	52.33 (1.94)	100 (1.22)
Total	21.69 (100)	8.62 (100)	36.71 (100)	32.98 (100)	100 (100)

Table 11 throws light on eating out amounts in three different locations: rural, urban and urban slums. The contrast in some respects is striking. The proportions of households spending larger amounts decreases in rural areas but not so sharply; in the urban areas, by contrast, the proportion of households spending larger amounts rises but slowly until the highest eating out expenditure range. In fact, about 16 per cent of the households spend moderately high or high amounts on eating out. But the urban slums are not far behind. About 33 per cent of the households spent small or slightly larger amounts but about 14 per cent also spent moderately high or high amounts. As noted already, thus even deprived locations are not immune to life-style changes and convenience of eating out.

Table 11
Distribution of Household Expenditure on Eating Out by Location

Eating Out (Rs)	Rural	Urban	Urban Slums	Total
None	74.82 (72.71)	23.88 (64.80)	1.29 (54.10)	100 (70.35)
1–99	77.45 (13.34)	20.06 (9.65)	2.50 (18.50)	100 (12.47)
100–199	67.45 (7.90)	29.68 (9.71)	2.86 (14.44)	100 (8.480
200–499	54.54 (4.95)	42.45 (10.75)	3.01 (11.76)	100 (6.57)
>500	37.20 (1.10)	61.86 (5.09)	0.95 (1.20)	100 (2.13)
Total	72.39 (100)	25.93 (100)	1.68 (100)	100 (100)

In Tables 12, 13 and 14, we give cross-classifications of household expenditure on eating out by type of family in the aggregate sample, metros and rural areas (excluding the metros), respectively. Let us first consider the results from the aggregate sample.

Among those who eat out in nuclear families, there is a steady decrease in the share of households as expenditure on eating out rises. In fact, a large majority of these (76 per cent) spent small amounts (i.e. <Rs 200) while the remaining spent >Rs 200.

The pattern is similar among joint families. About 71 per cent spent small amounts (<Rs 200), and the remaining moderate amounts (>Rs200).

If these results are compared with those for the metros, the patterns are different, as shown in Table 13. It is not just that more nuclear families eat out, they also tend to spend larger amounts (relative to the aggregate sample). About 50 per cent of these spent small amounts (<Rs 200) while about 17 per cent spent large amounts (>Rs 500). Among the joint families, a considerably higher proportion ate out. However, about half spent small amounts (<Rs 200) while over 16 per cent spent large amounts (>Rs 500). So more joint families in the metros ate out and spent larger amounts too, as compared with the aggregate sample.

Table 12
Distribution of Expenditure on Eating Out by Family Type
(Aggregate)

Eating Out (Rs)	Nuclear	Joint	Other	Total
None	53.03 (72,16)	38.17 (69.88)	8.81 (80.63)	100 (71.93)
1–99	55.79 (13.67)	38.15 (12.58)	6.07 (10.01)	100 (12.95)
100–199	50.59 (7.42)	44.04 (8.69)	5.36 (5.29)	100 (7.75)
200–499	48.08 (5.18)	47.57 (6.90)	4.35 (3.16)	100 (5.70)
>500	49.70 (1.57)	46.01 (1.95)	4.29 (0.91)	100 (1.67)
Total	52.86 (100)	39.29 (100)	7.86 (100)	100 (100)

Table 13
Distribution of Expenditure on Eating Out by Family Type in Metros

Eating Out (Rs)	Nuclear	Joint	Other	Total
None	63.77 (69.10)	28.73 (60.10)	7.49 (75.63)	100 (66.66)
1–99	57.47 (6.46)	35.96 (7.80)	6.56 (6.87)	100 (6.91_
100–199	53.94 (9.0)	40.30 (13.43)	5.76 (9.26)	100 (10.62)
200–499	59.95 (10.23)	36.76 (12.11)	3.29 (5.24)	100 (10.50)
>500	56.84 (4.90)	39.43 (6.57)	3.73 (3.0)	100 (100)
Total	61.52 (100)	31.87 (100)	6.60 (100)	100 (100)

In the rural areas, about the same proportion of nuclear and joint families (about 25 per cent) ate out and large majorities (84 per cent and 78 per cent, respectively) spent small amounts, while a larger segment of the latter spent amounts exceeding Rs 200.

Some of the key results of the cross-tabulations are illustrated graphically using pie charts in the Annex.

Table 14
Distribution of Expenditure on Eating Out by Family Type in Rural Areas
(Excluding Metros)

Eating Out (Rs)	Nuclear	Joint	Other	Total
None	50.55 (74.71)	40.58 (7.53)	8.87 (83.21)	100 (74.48)
1–99	54.62 (15.40)	39.84 (13.58)	5.54 (9.91)	100 (14.21)
100–199	46.65 (6.12)	48.32 (7.66)	5.03 (4.19)	100 (6.61)
200–499	40.09 (3.12)	55.24 (5.19)	4.67 (2.30)	100 (3.92)
>500	41.51 (0.65)	54.56 (1.04)	3.93 (0.39)	100 (0.79)
Total	50.39 (100)	41.67 (100)	7.94 (100)	100 (100)

In sum, eating out is a pervasive phenomenon — especially in the urban areas and, more specifically, in the metros. While relatively affluent are more prone to eating out and spend larger amounts, some of the deprived segments, using not just income/expenditure criteria but also caste and location, do not seem to lag far behind. Nor is eating out merely an urban phenomenon, as large segments in rural areas eat out too.

Heckman Selection Model

While these cross-tabulations yielded some insights into the pervasiveness of the eating out phenomenon, the marginal contributions of household traits — including their poverty status, demographic composition, whether a nuclear or a joint family — and locational effects could not be assessed. To do so, we have experimented with the Heckman selection model. This comprises two stages: first, the decision to eat is analysed, followed by how amounts spent on eating out vary with household and other characteristics.

As detailed expositions of the Heckman model are available in various text books, we draw upon Wooldridge (2006).

The approach to incidental truncation is to add an explicit selection equation to the population model of interest:

$$y = x\beta + u, \ E(u|x) = 0 \tag{1}$$

$$s = 1[z\gamma + v \geq 0], \tag{2}$$

where s =1 if we observe y, and 0 otherwise. As the elements of x and z are always observed, we write $x\beta = \beta_0 + \beta_1 x_1 + \beta x_2 + ...\beta_k x_k$ and $z\gamma = \gamma_0 + \gamma_1 z_1 + ...\gamma_m z_m$.

The equation of primary interest is (1), and β could be estimated by OLS given a random sample. The selection equation, (2), depends on observed variables, z_h, and an unobserved error, ν. Exogeneity of z implies $E(u|x,z) = 0$. In fact, for the model that we propose to estimate, x must be a subset of z.

The error term, ν, in the sample selection equation is assumed to be independent of z (and therefore x). It is also assumed that ν has a standard normal distribution. Any correlation between u and ν causes a sample selection problem.

As u and ν are related, and ν has a standard normal distribution, it is easy to show that $E(\nu|z,s)$ is simply the inverse Mills ratio, $\lambda(zy)$, when $s = 1$.[12] This leads to the important equation

$$E(y|z,s) = x\beta + \rho E(\nu|z,s). \qquad\qquad (3).$$

Equation (3) shows that expected value of y, given z and observability of y, is equal to $x\beta$, plus an additional term that depends on the inverse Mills ratio evaluated at $z\gamma$. This equation shows that we can estimate β by using only the selected sample, provided we include $\gamma(z\gamma)$ as an additional regressor.

If $\rho = 0, \lambda(zy)$ does not appear, and OLS of y on x using the selected sample consistently estimates β. Otherwise, effectively the variable, $\lambda(zy)$, correlated with x, is omitted. $\rho = 0$ when u and ν are uncorrelated.

Since λ is unknown, we cannot evaluate $\lambda(z_i\gamma)$ for each i. However, given the assumptions, and, with s also given, z follows a probit model

$$P(s=1|z) = \Phi(z\gamma)\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \qquad\qquad (4)$$

So γ is estimated by probit of s_i on z_i, using the entire sample. In a second step, β is estimated from a regression of y_i on x_i, $\hat{\lambda}_i$, using the selected sample for which $s_i=1$. The $\hat{\beta}_j$ are consistent and approximately normally distributed. The t statistic on $\hat{\lambda}_i$ tests $H_0 = 0$. Under H_0 there is no selection bias.

An alternative to this two-step estimation is full maximum likelihood estimation. This requires obtaining the joint distribution of y and s. Usually, the two-step procedure is applied first to test for selection bias. After the selection bias is confirmed, the regression and selection equation are estimated jointly by MLE (Wooldridge, 2006).[13]

---

[12] For details, see Wooldridge (2006).

[13] Adkins and Hill (2008) also recommend the MLE procedure. They observe "In most instances, it is preferable to estimate the full model, both the selection equation and the equation of interest, jointly by maximum likelihood" (p.399).

Results

As the two-step procedure rejects the null, $H_0=0$, shown in Table 15, our comments are confined to the MLE results in Table 16.

Let us first consider the probit results. The main findings are:

- Both metro and non-metro urban locations induce eating out, relative to the rural. As life style changes in these locations have been more dramatic and convenience of eating out is greater, these are plausible results.

- Both nuclear and joint families display higher propensies to eat out relative to others. Between the two, joint families are more likely to eat out.

- While the coefficient of SCs/STs is negative, it is weakly significant, implying a lower propensity to eat out, relative to the omitted group of Others. That of OBCs is positive and significant, suggesting that they are more likely to eat out.

- The higher the number of adult males in paid work in the two age groups, 18 to 24 years, and 25 to 45 years, the greater is the likelihood of such households eating out. The same applies to the number of adult females in paid employment in these age groups.

- Controlling for the effects of these and other right side variables, the higher the ratio of per capita expenditure to the poverty cut-off expenditure, the higher is the probability of such households eating out. This confirms the important role of growing affluence in dietary changes.

- We have further examined whether the sources of income matter too. The higher the share of salary in household income, the greater is the likelihood of eating out. While the effect of higher share of business income is positive too, it is weakly significant.

- The higher the number of adult males in paid work in the two age groups, 18 to 24 years, and 25 to 45 years, the greater is the likelihood of such households eating out. The same applies to the number of adult females in paid employment in these age groups.

Table 15
Heckman Selection Model — Two-Step Estimates

Heckman selection model — two-step estimates		Number of o	=	41349	
(regression model with sample selection)		Censored obs	=	29697	
		Uncensored obs	=	11652	
		Wald chi2(20)	=	1977.64	
		Prob > chi2	=	0.0000	
	Coef.	Std. Err.	z	P>z	
Eating out — Rs.					
Metro	97.41035	9.153334	10.64	0	
Urban	17.13643	6.649995	2.58	0.01	
SC/ST	-38.28974	6.758803	-5.67	0	
OBC	-57.63362	6.22415	-9.26	0	
Expenditure Poverty Ratio	17.29877	1.543485	11.21	0	
No. of adult males in paid work age group 18-24	-6.422317	6.5436	-0.98	0.326	
No. of adult males in paid work age group 25-45	6.749505	5.046546	1.34	0.181	
No. of adult males in paid work age group >45	11.13983	6.466939	1.72	0.085	
share of salary in total income	-0.4735356	0.3452486	-1.37	0.17	
share of business income in total income	0.4673173	0.1222451	3.82	0	
_cons	429.4722	36.46348	11.78	0	
Recode Eating out (0/1)					
Metro	0.2081591	0.0230919	9.01	0	
Urban	0.1858965	0.0159761	11.64	0	
Nuclear Family	0.2740344	0.0282138	9.71	0	
Joint family	0.3677165	0.0288986	12.72	0	
SC/ST	-0.0411038	0.0177504	-2.32	0.021	
OBC	0.1123784	0.0159338	7.05	0	
Expenditure Poverty Ratio	0.0931872	0.0030568	30.49	0	
No. of adult males in paid work age group 18-24	0.0889712	0.0172724	5.15	0	
No. of adult males in paid work age group 25-45	0.0771043	0.0127216	6.06	0	
No. of adult males in paid work age group >45	-0.0081029	0.0179003	-0.45	0.651	
No. of adult females in paid work age group 18-24	0.159953	0.0282207	5.67	0	
No. of adult females in paid work age group 25-45	0.1354875	0.0167471	8.09	0	
No. of adult females in paid work age group >45	-0.0170181	0.0284469	-0.6	0.55	
share of salary in total income	0.1254854	0.0165585	7.58	0	
share of business income in total income	0.0012523	0.000547	2.29	0.022	
_cons	-1.303558	0.0310907	-41.93	0	
mills					
lambda	-256.9678	24.87149	-10.33	0	
rho	-0.79844				
sigma	321.83744				
lambda	-256.96777	24.87149			

Turning to the factors underlying the eating out expenditure, our main results are the following.

- Location matters a great deal. 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.

- Both SCs/STs and OBCs are likely to spend lower amounts relative to Others.

Table 16
Heckman Selection Model — MLE Results

Heckman selection model		Number of obs	=	41349	
(regression model with sample selection)		Censored obs	=	29697	
		Uncensored obs	=	11652	
		Wald chi2(10)	=	548.52	
Log pseudolikelihood = -4.74e+08		Prob > chi2	=	0.0000	

	Coef.	Robut Std. Err	z	P>|z|
Eating out - Rs.				
Metro	104.2238	11.2702	9.25	0
Urban	47.15219	5.799586	8.13	0
SC/ST	-45.25382	5.102639	-8.87	0
OBC	-37.58008	8.516833	-4.41	0
Expenditure Poverty Ratio	26.57366	2.653255	10.02	0
No. of adult males in paid work age group 18-24	5.279526	5.651607	0.93	0.35
No. of adult males in paid work age group 25-45	19.95253	5.85688	3.41	0
No. of adult males in paid work age group >45	20.97598	13.91832	1.51	0.13
share of salary in total income	-0.2054892	0.1046213	-1.96	0.05
share of business income in total income	0.5358787	0.3416282	1.57	0.12
_cons	121.2509	14.76449	8.21	0
Recode Eating out (0/1)				
Metro	0.1501872	0.0390624	3.84	0
Urban	0.2013181	0.0203902	9.87	0
Nuclear Family	0.2849823	0.0407049	7	0
Joint family	0.4013781	0.0424468	9.46	0
SC/ST	-0.0368894	0.0245217	-1.5	0.13
OBC	0.097246	0.0232568	4.18	0
Expenditure Poverty Ratio	0.1194413	0.007103	16.82	0
No. of adult males in paid work age group 18-24	0.0971875	0.0240406	4.04	0
No. of adult males in paid work age group 25-45	0.0993962	0.0194385	5.11	0
No. of adult males in paid work age group >45	0.0253304	0.0297687	0.85	0.4
No. of adult females in paid work age group 18-24	0.1721438	0.0446598	3.85	0
No. of adult females in paid work age group 25-45	0.1119627	0.0245254	4.57	0
No. of adult females in paid work age group >45	-0.0177909	0.0401841	-0.44	0.66
share of salary in total income	0.1656913	0.0306916	5.4	0
share of business income in total income	0.0014672	0.0011262	1.3	0.19
_cons	-1.376383	0.0468827	-29.36	0
/athrho	-0.2241698	0.0411004	-5.45	0
/lnsigma	5.392404	0.0817619	65.95	0
rho	-0.2204888	0.0391023		
sigma	219.7311	17.96563		
lambda	-48.44823	6.923901		
Wald test of indep. eqns. (rho = 0): chi2(1) = 29.75 Prob > chi2 = 0.0000				

- The higher the number of adult males in paid employment in the age-group 25 to 45, the greater is the amount spent. A similar result is obtained for the number of adults in paid employment in the older age group, >45 years, but the coefficient is only weakly significant.

- 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.

In sum, most of the results are plausible. Specifically, location of households, their demographic and caste characteristics and, above all, their relative affluence influence both the decision to eat out, and, conditional on it, the amount spent.

Concluding Observations

The main findings are summarised from a broad policy perspective.

Attention was drawn to growing affluence, urbanisation and dietary changes that are occurring at a rapid pace in developing countries. Of particular significance in the Indian context is the expansion of the middle class, higher female participation, 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 super markets and fast food outlets.

There have been concomitant changes in dietary patterns. Consumption of animal products — especially fats — has increased but that of vegetable products only moderately. Among the latter, consumption of wheat, starchy roots, vegetable oils and sweets and sweeteners, and fruits has increased while that of rice, pulses and other cereals has declined. Also, the forms in which some of these products are consumed has also changed — *chapatti*, for example, is increasingly replaced by commercialised and westernised bread products.

Health implications of these dietary patterns are, however, not clear-cut. On the one hand, a more varied and nutritionally balanced diet and higher levels of food hygiene are associated with better health outcomes. On the other, although energy dense foods associated with fast food outlets are cheaper and convenient, these are also linked to a higher incidence of diet-related non-communicable diseases or NCDs (e.g. diabetes, coronary heart disease). Although India lags behind other developing countries in the epidemiological transition — decline in infectious disease mortality is increasingly compensated for by higher mortality from chronic degenerative NCDs — there is some evidence of this trasition taking place.

Viewed from this perspective, 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.

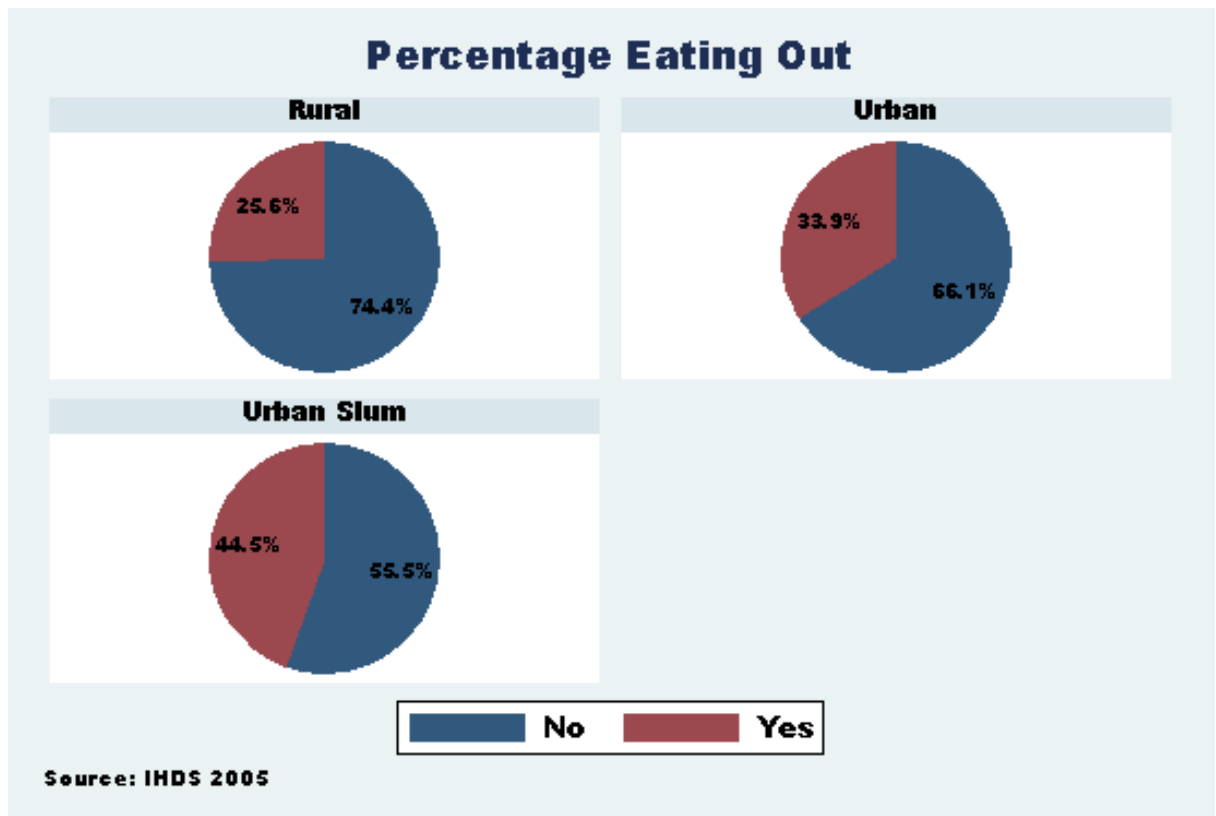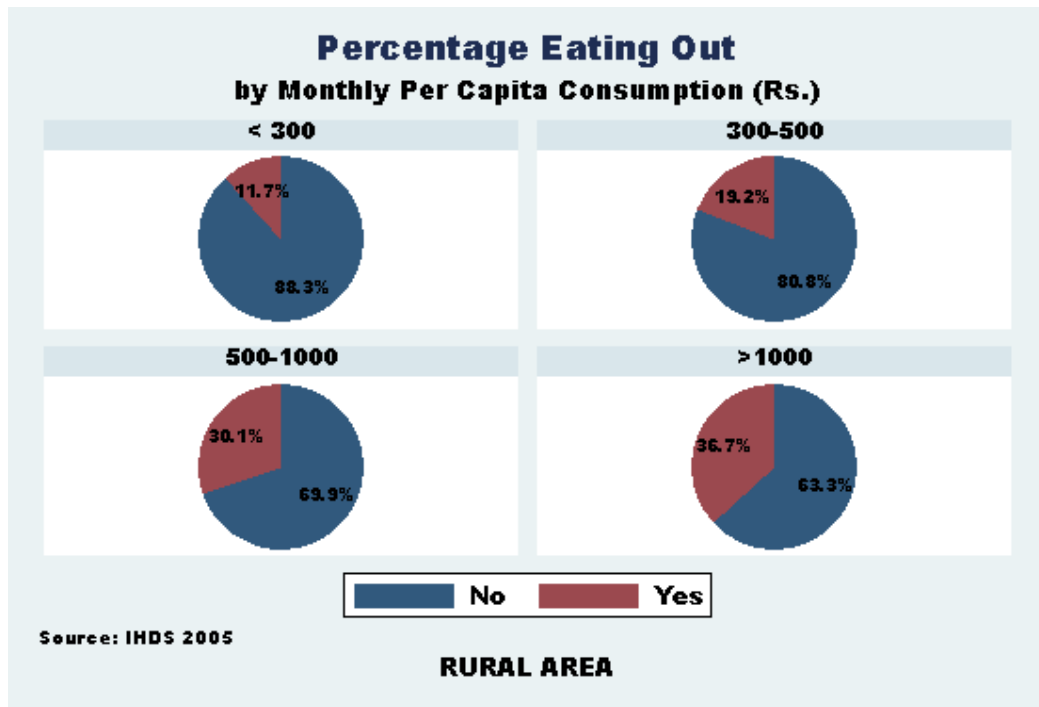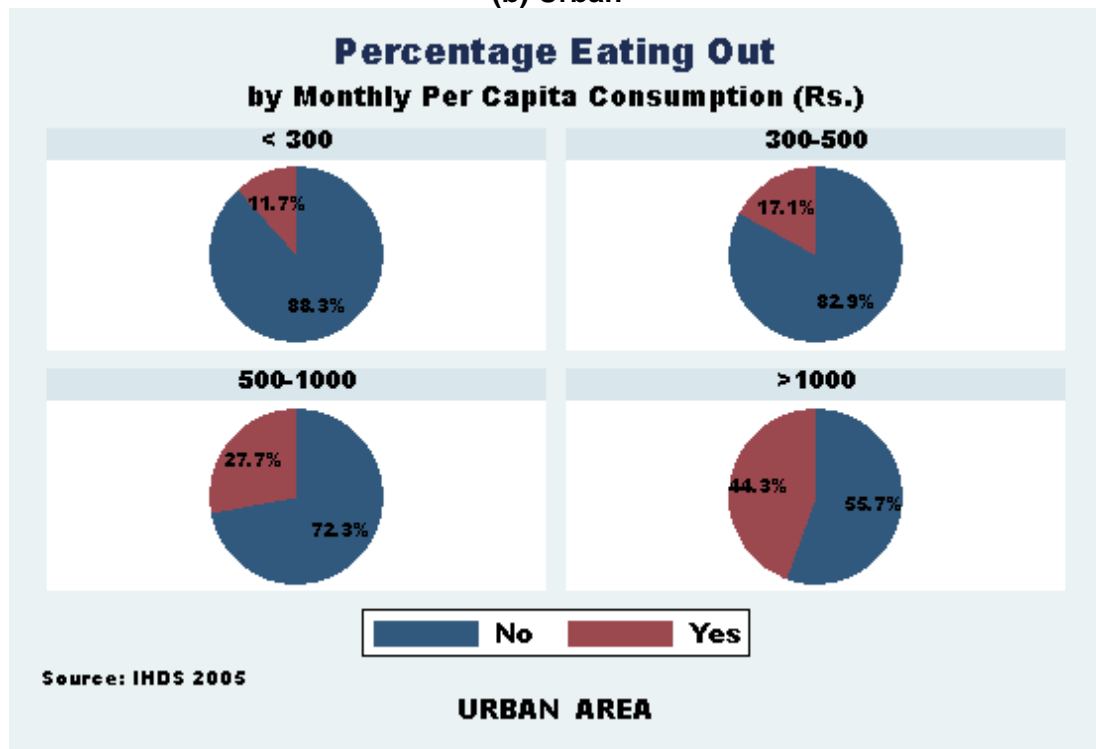**Fig 1: Distribution of Households Eating Out**

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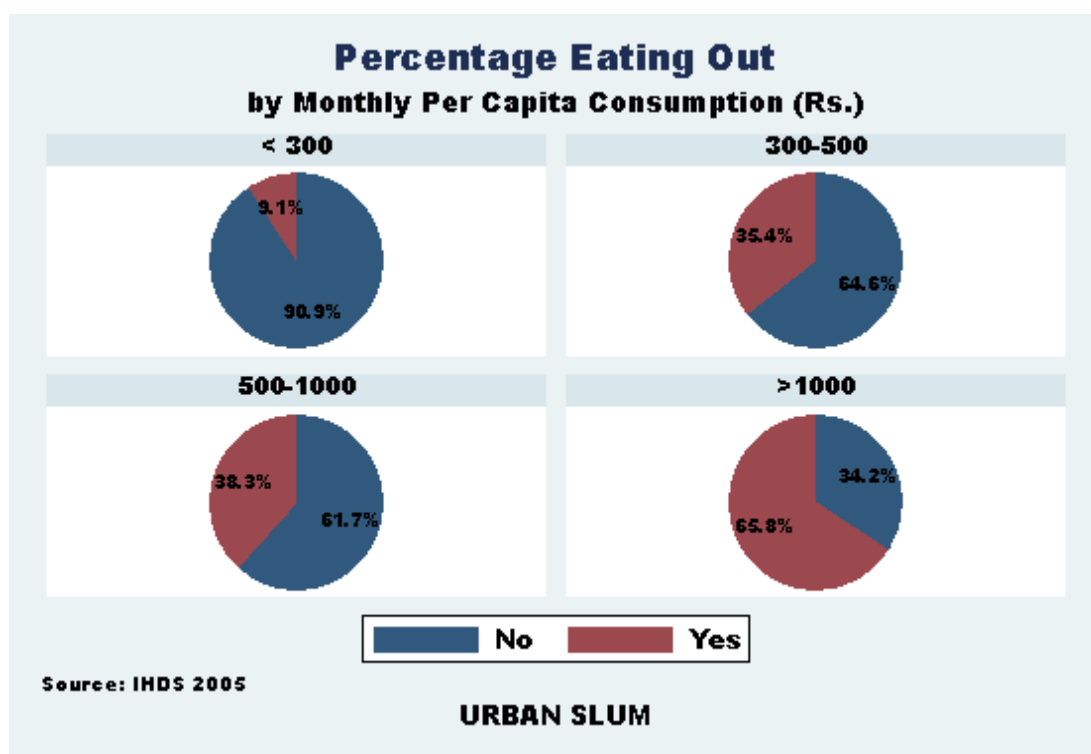
Fig 2: Distribution of Households Eating Out by MPCE (Rs)

(a) Rural

(b) Urban

(c) Urban Slums

Percentage Eating Out
by Monthly Per Capita Consumption (Rs.)

< 300 — 9.1% Yes, 90.9% No
300-500 — 35.4% Yes, 64.6% No
500-1000 — 38.3% Yes, 61.7% No
>1000 — 34.2% No, 65.8% Yes

No   Yes

Source: IHDS 2005

URBAN SLUM

(d) Aggregate

Percentage Eating Out
by Monthly Per Capita Consumption (Rs.)

< 300 — 11.7% Yes, 88.3% No
300-500 — 19.1% Yes, 80.9% No
500-1000 — 29.7% Yes, 70.3% No
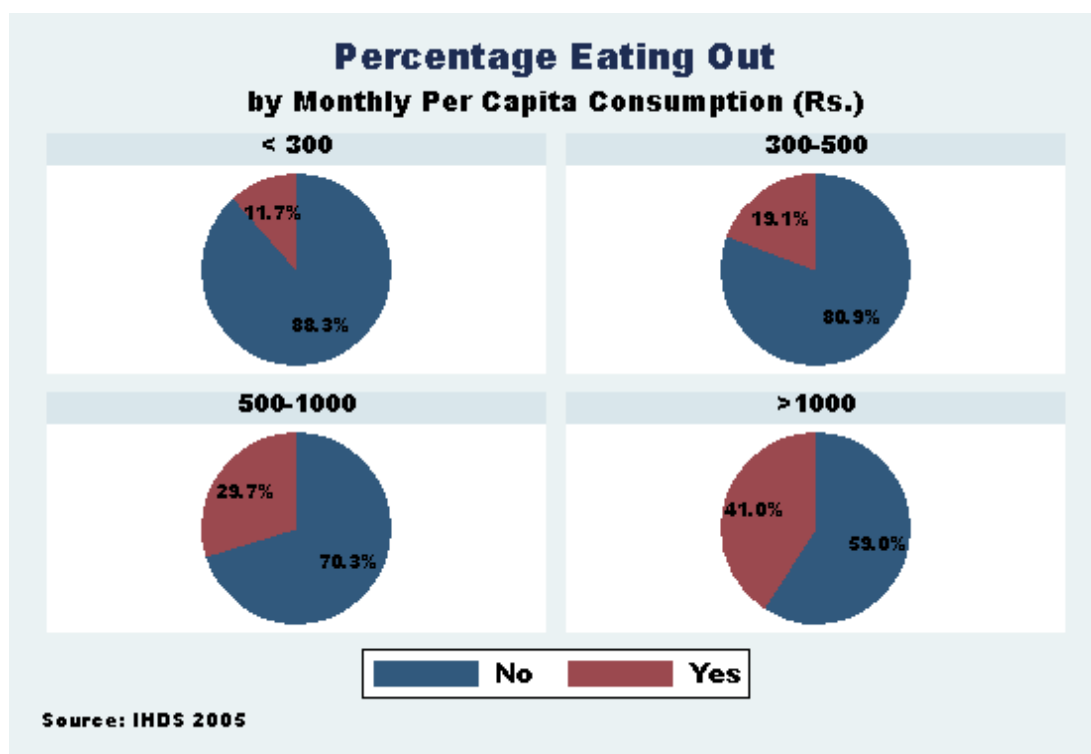>1000 — 41.0% Yes, 59.0% No

No   Yes

Source: IHDS 2005

Fig. 3: Distribution of Households by Eating Out Expenditure by Family Type (Nuclear)

Percentage Eating Out
Nuclear Families

Legend: none, 1-99, 100-199, 200-499, >=500

Source: IHDS 2005

(Joint)

Percentage Eating Out
Joint Families

Legend: none, 1-99, 100-199, 200-499, >=500

Source: IHDS 2005

(Others)

Percentage Eating Out — Other Families

Source: IHDS 2005
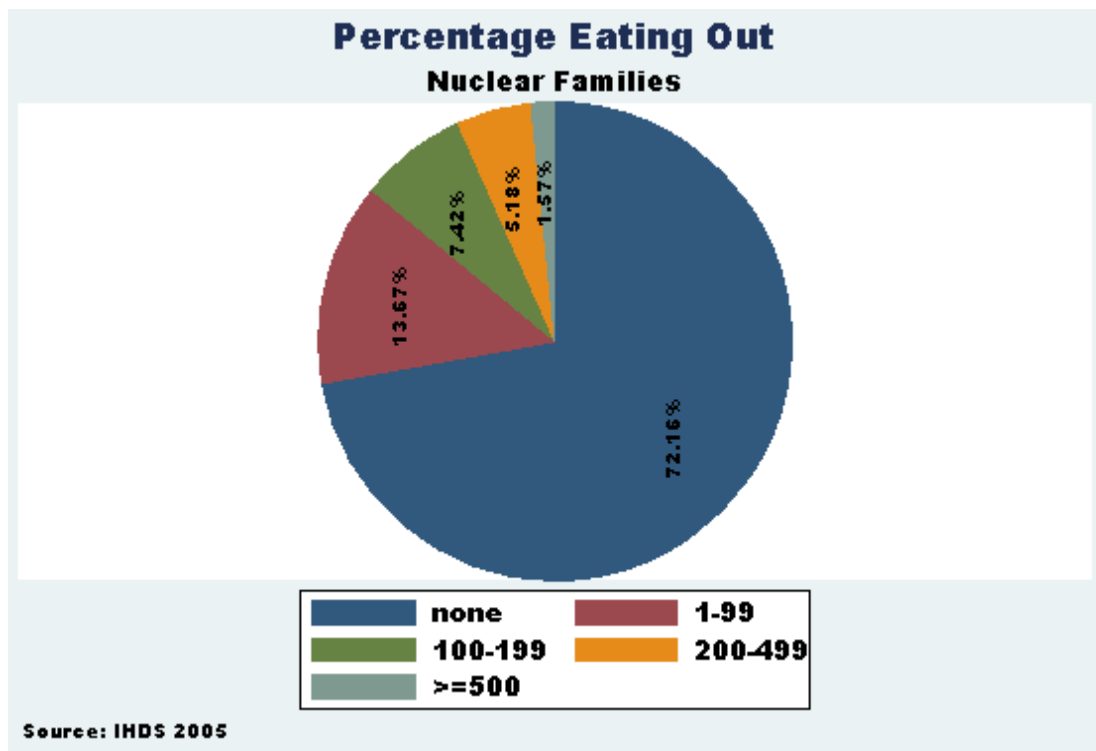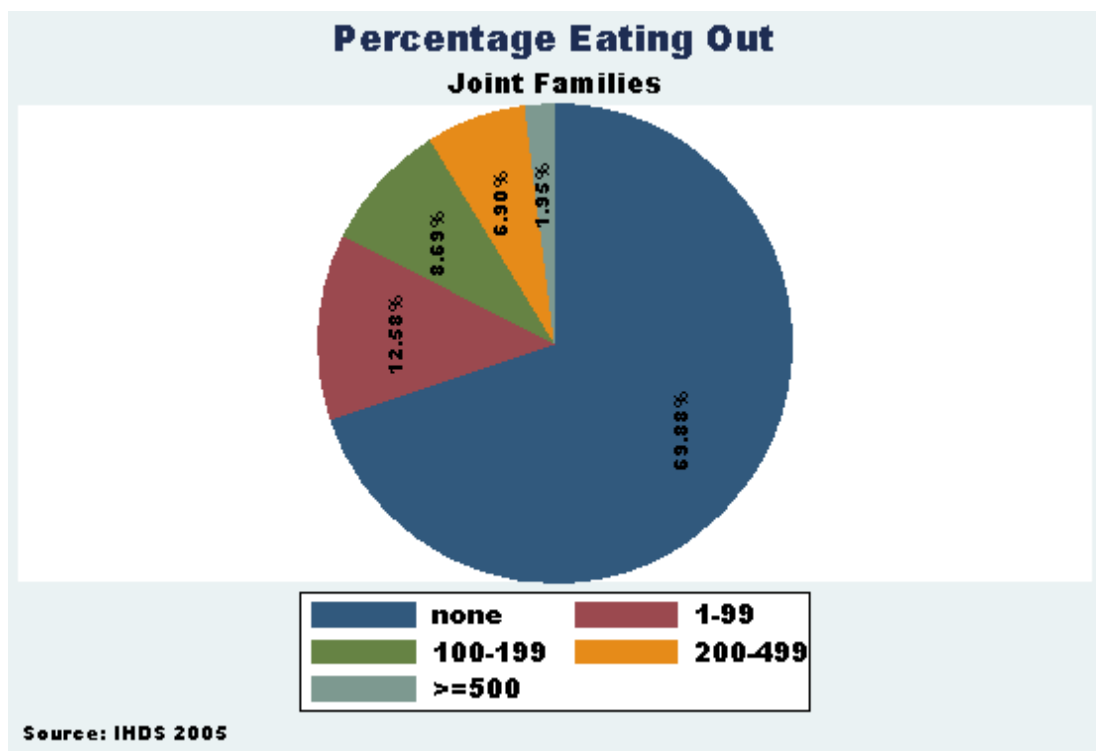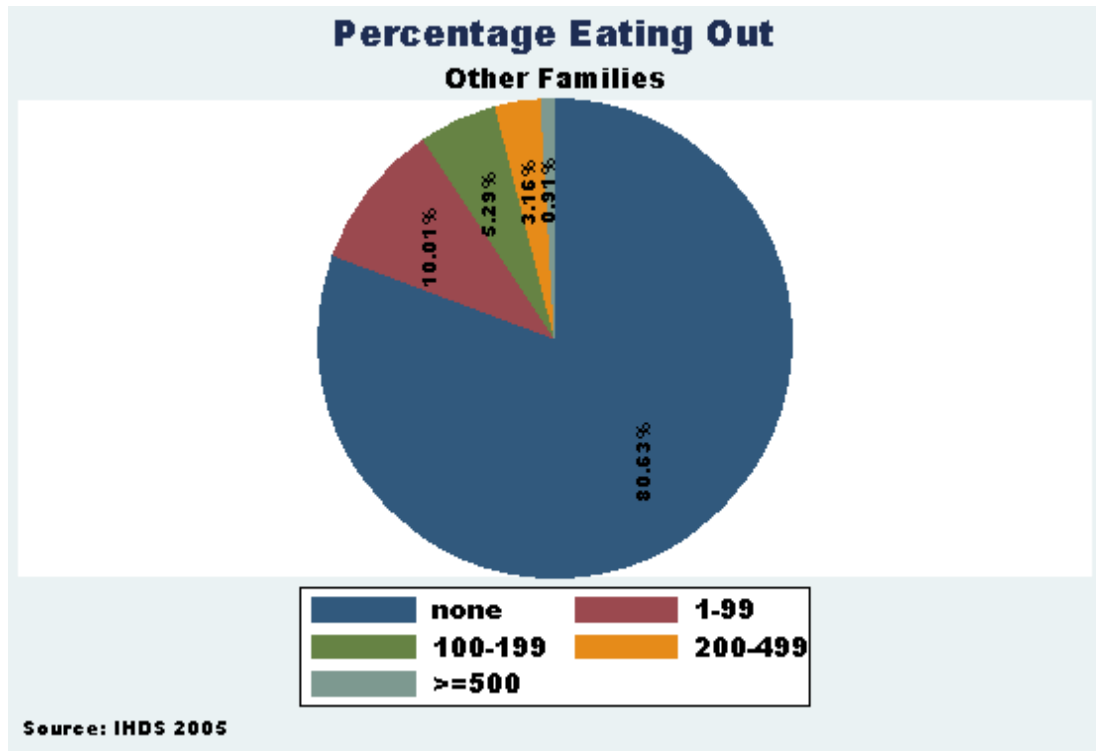
References

Adkins, L.C. and R.C. Hill (2008) Using Stata for Principles of Econometrics, Hoboken, NJ: John Wiley & Sons.

Deaton, A. and J. Dreze (2009) "Food and Nutrition in India: Facts and Interpretations", *Economic and Political Weekly*, XLIV (7), 42–65.

Gaiha, R., G. Thapa, K. Imai and Vani S. Kulkarni (2008) "Has Anything Changed? Deprivation, Disparity and Discrimination in Rural India", *Brown Journal of World Affairs*, Spring/Summer.

Himanshu (2007) "Recent Trends in Poverty and Inequality: Some Preliminary Results", *Economic and Political Weekly*, XLII (6), 497-508..

Jha, R., R..Gaiha and A. Sharma (2009) "Calorie and Micronutrient and Poverty Nutrition Traps in Rural India", *World Development*, 37 (5), 982–991.

Mahal, A., A. Karan and M. Engelgau (2009) *The Economic Implications of Non-Communicable Diseases for India*, draft.

Mahal, A., and A. Karan (2008) "Adequacy of Dietary Intakes and Poverty in India: Trends in the 1990s", *Economics and Human Biology*, 6 (1), 57–74.

Pingali, P. (2007) "Westernisation of Asian Diets and the Transformation of Food Systems: Implications for Research and Policy", *Food Policy*, 32 (3), 281–298.

Pingali, P. and Y. Khwaja (2004) "Globalisation of Indian Diets and the Transformation of Food Supply Systems", ESA Working Paper No. 04–05, Rome: FAO.

Popkin, B., S. Horton, S. Kim, A. Mahal, and J. Shuigao (2001) "Trends in Diet, Nutritional Status, and Diet-Related Non-Communicable Diseases in China and India: The Economic Costs of the Nutrition Transition", *Nutrition Reviews*, 59 (12), 379–390.

Reddy, K. Srinath, B. Shah, C. Varghese, A. Ramadoss (2005) "Responding to the Threat of Chronic Diseases in India", *The Lancet*, October 5.

Shetty, P.S. (2002) "Nutrition Transition in India", *Public Health Nutrition*, 5 (1A), 175–182.

Timmer, C.P. (2009) "Do Supermarkets Change the Food policy Agenda?", *World Development*, forthcoming.

Wooldridge, J.M. (2006) *Introductory Econometrics*, Mason, OH: Thomson: South Western.