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ABSTRACT

Labor Market Engagement and the Health of Working Adults: Evidence from India*

Driven by rapid income growth, labor market transitions in the nature of jobs, and lifestyle factors, there has been a widespread increase in rates of overweight and obesity in many countries. This paper examines the effect of occupational engagement and work intensity on the weight of urban working women and men in India. Using nationally representative data, a variety of specifications that reflect different definitions of work, and empirical methods that correct for the influence of unobservables, we document that labor market inactivity is positively associated with BMI. We offer policy recommendations that may help mitigate some of these unintended consequences. Our paper builds on the fairly limited evidence on the relationship between labor market engagement and health in developing countries.

JEL Classification: I12, I15, O12
Keywords: excess weight, labor market, gender, India

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1. Introduction

One of the striking global health trends in the recent past has been the rapid increase in the rates of overweight and obesity in both developed and developing countries. According to Lancet (2016), over the period 1975-2014, the number of obese individuals in the world has increased from 105 million to 641 million. Obesity is increasingly viewed as a global pandemic, with more obese people than under-weight in the world today. Indications are that the problem is only going to worsen in the future, thus contributing to the global burden of health.

Policy makers in developing countries therefore face an obesity led increase in projected public health expenditures. This is especially true in India where the high rates of economic growth in the last two decades and the resultant increase in income and wealth have been associated with an increase in the proportion of the population that is overweight or obese. India currently has the third highest number of overweight and obese individuals among all countries, with 20% of adults and 11% of adolescents characterized as belonging to this category (Lancet (2014)). The health implications are substantial, with excess weight being positively associated with chronic health risks like hypertension and diabetes. Understandably, the impact of these diseases on household budgets is likely to be substantial. Engelgau, et al. (2012) argues that in India the risk of impoverishment due to non-communicable diseases like heart disease is about 40% higher as compared to that due to communicable diseases, and households in India with a heart disease patient are estimated to spend up to a third of their annual income on health expenses.

Weight gain is the result of high energy intake or low energy expenditure or a combination of both (Roberts and Leibel (1998)). In the Indian context, evidence suggests that there has been no significant increase in average energy intake over time; rather there has been a secular decline in average energy intake (Deaton and Drèze (2009) and Ramachandran (2014)). Therefore, any analysis of weight should account for energy expenditure in order to provide a comprehensive picture of the dynamics underlying weight. This is the lens that we employ here. Specifically, using nationally representative data from India, we examine the effect of

occupational activity on the weight of urban working Indians. Occupational activity is measured by sector of work and intensity of work.[1] We focus on urban residents as prior research (Maitra and Menon (2017)) shows that the phenomenon of overweight and obesity is especially pronounced in urban India.

Tailoring measures of physical intensity to reflect the structure of occupations specific to India, this paper provides new evidence on this topic from a country where the number of over-nourished people is increasing dramatically. We employ several empirical specifications to analyze the relationship between occupational activity levels and weight status. Conditional on observed covariates and controls for location and time, we find that being employed in a low activity occupation results in higher weight. This holds true for different ways of measuring intensity of work, and for both males and females engaged in the labor market and residing in urban regions of India. Our results are robust to a variety of specification tests.

This paper builds on the fairly limited evidence on the relationship between labor market participation and the health of working men and women in developing countries, and is consistent with the sparse evidence on the relationship between the physical strenuousness of occupations and weight in other developing countries. Colchero, et al. (2008) using longitudinal data from Philippines finds that BMI among women employed in occupations involving low and medium physical activity were respectively 0.29 and 0.12 kg/m^2 greater compared to women employed in heavy physical activity occupations. Adair (2004), again using data from Philippines, showed that improvements in socioeconomic status, a reduction in the number of hours worked, and urban residence, were all systematically positively correlated with weight gain. Similar results have been obtained from China. Paeratakul, et al. (1998) find that women employed in physically strenuous occupation had 0.42 kg/m^2 lower BMI than women in relatively less physically strenuous jobs; Bell, et al. (2001) find that both men and women engaged in low and moderate

[1] The intensity of work refers to the physical demands of or the energy expenditure associated with each occupation. Methods to capture the intensity of work are well established and we discuss these in detail in Section 2.

physical activity at work experienced large weight (>5kg) gains as compared to women engaged in heavy physical activity. These studies emphasize that weight status is closely aligned with the physical intensity of work in developing countries, and underscore the importance of accounting for occupation-related energy expenditure in understanding determinants of weight.[2]

We build on the existing literature in two important ways. First, by demonstrating that occupational activity levels are important health predictors, we offer an explanation for the puzzling situation in India where increases in weight coexist with overall declines in energy intake levels. Hence, although intake levels may have declined, the aggregate occupational structure of the economy appears to have transitioned to a more sedentary profile that accompanies general structural development over time. In consequence, individuals continue to be net consumers of energy. Second, by creating a mapping of occupations and metabolic equivalent values (discussed below), we provide a more comprehensive, continuous measure of the intensity of work profiles in India.

2. Data and construction of the estimation sample

Our analysis is conducted using nationally representative data from two waves of the India Human Development Survey (IHDS) conducted in 2004-05 (henceforth referred to as the IHDS1) and 2011-12 (henceforth referred to as the IHDS2). 83% of the households from IHDS1 were re-surveyed in IHDS2. The survey collected information on health, education, employment, economic status, marriage, fertility, gender relations, and social capital. While both rounds of the survey collected anthropometric data for women, the corresponding data for men was collected

[2] The literature from developed countries is more mixed. Lakdawallah and Philipson (2002) using data from the US find that a woman who spends one year in the least physically demanding job has a significantly higher weight as compared to a woman who spends a year in the most physically demanding job. He and Baker (2004) however find no statistically significant relationship between light or vigorous physical activity in the workplace and weight gain in the US. Using data from Finland, Bockerman, et al. (2008) finds that a man weighs lower when his occupation is physically demanding compared with males involved in sedentary jobs. Gender-disaggregated impacts are also found in Abramowitz (2016) where the association between time spent in work and BMI is most pronounced in non-strenuous jobs.

systematically only in 2011. In this paper, we concentrate on the repeated cross-sectional aspect of the data. This is because panel estimations require adequate variation in measures of labor market engagement in order to evaluate their effects on weight outcomes. However, we find that up to 90% did not change occupations across rounds of the IHDS.[3]

We use Body Mass Index (BMI) as our primary indicator of weight. BMI, defined as the ratio of weight (in kilograms) to height (in meters) squared is commonly accepted as a key indicator of weight. BMI can also be used to categorize individuals into different weight categories: underweight (BMI < 18.5), normal weight (BMI $\in [18.5, 25)$), overweight (BMI $\in [25, 30)$), obese (BMI $\in [30, 40)$) and morbidly obese (BMI ≥ 40). Although we highlight these indicator categories for illustrative purposes, we use the continuous measure of BMI.[4]

The primary focus of our analysis is working men and women 18–60 years old, residing in urban areas of India. We exclude the sample of individuals who have not worked in the one year prior to the survey (i.e., non-working men and women). It is well understood that the sample of people who work is systematically different from the sample of people who do not work, that is, the working population is non-random. Selection into work could be driven by ability for example, as more able people tend to be better educated and thus more suited to remunerative occupations in the labor market. However, it is not clear what metabolic equivalent values should be assigned to those who are not engaged in the labor market. Rather than combine disparate populations (those working and those not working) and use arbitrarily assigned metabolic equivalent values for those absent from the labor market, we restrict our analysis to only those who work.[5] Additionally, we find that BMI in the first round does not predict withdrawal from

[3] Roemling and Qaim (2013) also do not use the panel aspect of the Indonesian data for similar reasons.
[4] This is because, as WHO (2004) argues, these general cut-offs might not be appropriate for the Asian population: in particular, Asian populations have different associations between BMI, percentage of body fat and health risks compared to the European population.
[5] Depending on the definition of work used, between 79–83% of women and 23–28% of men do not work. We compare the results for the working sample to those for the full sample (i.e., including those that were not engaged in the labour market in the previous year). The two sets of results are similar (see Section 4) indicating that restricting the sample to only those who work is not restrictive.

the labour market, i.e., the decision to work is independent of weight status. While this increases confidence in the estimates, we recognize that the generalizability of our results is limited.

Both the IHDS1 and the IHDS2 surveys contain information on whether any household member worked on farms, worked for payment (wage/salary), or worked for a household business during the 12-month period preceding the survey. Also included are questions on the type of occupation/business, number of days worked in the preceding year, and hours worked in a day in each occupation.[6] Using this, we compute total hours worked in the preceding year which is the sum of hours spent working on farms, household business and for wage/salary.[7] We use two definitions of work. First, we define an individual to be employed if he/she is involved in an economic activity *for the majority of the year*. We aggregate the number of days worked across all categories to get the total number of days worked in the preceding year. An individual is considered to be employed if he/she worked for at least 180 days in the preceding year. This is *Definition* 1. This is similar to the usual principal status definition used by the National Sample Surveys of India (NSS).[8] In the second definition of work, an individual is considered to be employed if hours worked in the preceding year were at least 240 hours**.** This is *Definition* 2 (the IHDS definition of work). Not relying on a single definition also allows us to demonstrate the robustness of our results to alternate specifications; we show that the results are consistent irrespective of the definition used.

To examine the relationship between the intensity of work and BMI, we define intensity in a number of ways. Our first measure of intensity is an individual's sector of work. We use the

[6] Within the wage/salary category, there are individuals who report working in more than one job. IHDS2 contains information on number of days worked, hours worked in a day, and type of occupation for all jobs an individual is engaged in, while IHDS1 contains information only for one job. Since the proportion of individuals in urban areas who have more than one job is very low in both rounds, to maintain consistency, we exclude individuals who work in more than one job within the wage/salary category.

[7] If a household had more than one type of business, information on the other type was also included. In total, three household business types were included in the questionnaire. If the individual worked on multiple businesses, total time spent in household business was computed as the aggregate of hours spent in the three businesses. To compute the hours spent in an activity in the preceding year, we multiply the days worked in the preceding year in that activity by the (average) hours spent in a day on that activity.

[8] A difference between *Definition 1* (used in this paper) and the NSS definition of principal status is that we condition on the number of days. We use 180 days as an approximation of at least 50% of days worked in a year which is similar to the "major time criterion" used by NSS to define work status.

two-digit National Classification of Occupation (NCO) codes to identify the type of occupation associated with the primary activity, defined as one in which an individual spent maximum time in the preceding year. We then classify these occupations into white and blue-collar jobs.[9] White-collar jobs are generally not physically strenuous and include professionals, technical or administrative workers, executives, managers and clerical workers. Blue-collar jobs are more physically demanding and include individuals working in agriculture, manufacturing, sales and those classified as service workers (such as maids, sweepers, and protective service workers such as policemen or military personnel).[10] We use the occupation code associated with the primary activity of the individual to obtain a second classification of occupations: low, medium or high activity.[11] Under this categorization, all white-collar jobs are classified as low activity occupations. Blue-collar jobs were demarcated into medium activity occupations (sales and service workers and those in transport and communications) or high activity occupations (production workers, those in construction work.). Table A1 in the appendix provides further details on these classifications.

In order to get a measure of the physical strenuousness of work, we follow Tudor-Locke, et al. (2011) to assign each occupation a corresponding Metabolic Equivalent (MET) value in order to gauge the physical intensity of activities. METs are commonly used for evaluating the energy expenditure of a specific activity where a MET is the ratio of the rate of energy expenditure during an activity to the rate of energy expenditure at rest (one MET is the energy it takes to sit quietly or be at rest). Hence an individual engaged in an activity with a MET value of 4 expends 4 times the energy used by the body at rest. Using Tudor-Locke, et al. (2011), each occupation listed in India's National Classification of Occupations (NCO) at the three-digit level was cross-matched with the 509 detailed occupations in the 2002 Census Occupational Classification

[9] Fletcher and Sindelar (2009) also use similar classification.
[10] Specifically, occupations coded 00 to 36, 39, 40, 41, 42, 44 and 45 were categorized as white-collar jobs, while all other occupations were categorized as blue-collar jobs. See Table A2 for the actual occupations corresponding to each occupation code.
[11] We classify into low, medium, and high physical activity based on Colchero, et al. (2008).

System (OCS). We then take the average of MET values of corresponding three-digit codes to arrive at the two-digit level. Aggregation to this level is necessary as the IHDS data identifies occupations at the more composite level. Table A2 in the appendix presents details on the MET values assigned to each occupation. Following Tudor-Locke *et al*. (2011), we further categorize activities into three indicators of intensity levels: light (MET < 3.00), moderate (MET $\in$[3.00 – 6.00)) and vigorous (MET ≥ 6.00).

3. Empirical Framework

We estimate regressions of the following form:

$$BMI_{iht} = \beta_0 + \beta_1 Labor\ Market\ Activity_{iht} + \gamma X_{iht} + \varepsilon_{iht} \quad (1)$$

BMI_{iht} is the BMI of working individual i residing in household h at time t; $Labor\ Market\ Activity_{iht}$ (of individual i residing in household h at time t) is defined in a number of ways. Specification 1 defines labor market activity as the sector of work: working in a blue-collar occupation relative to a white-collar occupation. Specification 2 conditions on the individual being employed in a medium or high activity occupation relative to employment in a low activity occupation. Specification 3 uses continuous MET values associated with each occupation. Specification 4 includes dummies for occupations involving moderate and vigorous physical activity (categorizations based on MET values described above) with the reference category being light physical work. X_{iht} includes a set of individual and household level controls.[12] We also include a dummy for 2011-12 (IHDS2 survey) to take into account temporal variations and a set of state dummies to account for any unobserved state specific characteristics

[12] The individual level controls include age, age square, years of education, marital status, whether or not the individual consumes tobacco, number of children and the average number of hours spent watching television. The household level controls include dummies for wealth quartiles, whether or not the household has domestic help, whether the household owns a car or a motor cycle, household religion (Muslim, and others; the reference category is that the household is Hindu) and the share of total expenditure on eating outside.

(including government policy) that could potentially affect BMI.[13] The regressions for working women are run on the sample that does not report being pregnant; working men and women are restricted to be in the prime working age (18–60). Standard errors are clustered at the state level.

4. Descriptive Statistics

Summary statistics on the work definitions and categories defined above are shown in Table 1 – Panel A for women and Panel B for men. Panel A of Table 1 shows that conditional on working and depending on the definition of work used, 36–41% of women work in white-collar occupations. Table 1 reports that around 36% of women are in high activity jobs under *Definition 1*. The corresponding proportion under *Definition 2* is about 43%. Since all white-collar work is classified as low activity, about 36–41% of women are in such occupations.

Conditional on working, average BMI levels are higher for women employed in white-collar occupations than those in blue-collar occupations (24.26 kg/m^2 vs 22.75 kg/m^2), and higher among those engaged in low activity occupations than those in high activity occupations (24.26 kg/m^2 vs 22.64 kg/m^2). Consistent with the averages presented, the kernel density estimates presented in Panel A of Figure 1 show that the distribution of BMI of urban women working in white collar occupations stochastically dominates that of urban women working in blue collar occupations (p-value = 0.00 using Kolmogorov-Smirnov test, for both *Definitions 1* and *2*). Figure 2 presents the distribution of BMI by activity level of occupation. Panel A shows that the distribution of BMI for those working in low activity occupations stochastically dominates the BMI of those in medium and high occupations. Again, this result holds for both definitions of work.

Figure 3 presents the non-parametric lowess plots of the relationship between the intensity of work (MET value) and BMI. Panel A shows that for MET values of less than or equal

[13] For the regressions on the sample of men, we are unable to include the 2011 dummy as BMI data for males is only available in the IHDS2 survey.

to 2, an increase in intensity is not associated with changes in BMI. Beyond this range however, an increase in the strenuousness of occupations is associated with a systematic decline in BMI.

Table 1 shows that conditional on being employed, 64–70% of urban women are employed in light intensity occupations; the proportion declines to 5–8% for vigorous intensity occupations. As expected, the average BMI of women working in light intensity occupations is greater than those employed in high intensity occupations (23.73 kg/m^2 vs 22.15 kg/m^2). Panel A of Figure 4 corroborates these patterns. It shows that the distribution of BMI of women working in light intensity occupations stochastically dominates the BMI of women in moderate and vigorous intensity occupations.

The descriptive statistics presented in Panel B of Table 1 show, men aged 18–60 are considerably more likely to be engaged in the labor market as compared to women, with only 23–28% of men in the sample reporting not working.[14] Conditional on working, 38% of men are employed in white collar occupations and 41–43% are engaged in high activity occupations. As with the sample of women, those employed in white-collar occupations and those in low activity occupations have higher BMI compared to those in blue-collar occupations and in high activity occupations, respectively.

The averages presented in Panel B of Table 1 are corroborated by the kernel density estimates presented in Panel B of Figures 1, 2 and 4. The mass of the distribution of BMI for working males engaged in white-collar occupations, in low activity occupations and light intensity occupations lies to the right of that for those employed in blue-collar occupations, in high activity occupations and in vigorous intensity occupations, respectively. The Lowess plots of BMI on intensity of occupation presented in Panel B of Figure 3 show that for low MET values, there is a negative relationship between BMI and occupational intensity. This pattern switches in the case of high MET values.

[14] Data on anthropometrics for males was unfortunately collected systematically only in IHDS2. Our analysis of the relationship between labor market participation and BMI for urban males is thus restricted to the IHDS2 data.

5. Regression Results

5.1. Urban working women

Our ordinary least squares (OLS) regression results, corresponding to equation (1) are presented in Table 2. The results are consistent across the two definitions of work. However, as *Definition 1* reflects the more common NSS definition of work, we label those results as primary. Our main OLS results are thus presented in the first four columns of Table 2.

The results in column 1 of Table 2 show that relative to women working in white collar occupations, BMI is significantly lower for those working in blue collar occupations. The effect is fairly large. The coefficient estimate indicates that on an average, BMI among women working in blue collar occupations is a statistically significant 0.44 kg/m^2 lower compared to those working in white collar occupations. Given that the average BMI of women working in blue collar occupations is 24.26 kg/m^2, this is a 1.85% difference. The results presented in column 2 of Table 2 show that relative to those working in low activity occupations, the BMI of those working in medium activity occupations is 0.29 kg/m^2 lower, while the BMI of those working in high activity occupations is 0.54 kg/m^2 lower respectively, with the latter coefficient being precisely estimated. The BMI of those working in medium activity occupations is larger than those in high activity occupations; however, this effect is not statistically significant when we use *Definition 1*.[15]

The results presented in column 3 of Table 2 show that any increase in MET is associated with a sharp decline in BMI: a one-unit increase in MET is associated with a 0.26 kg/m^2 reduction in BMI. Finally, the regressions presented in column 4 show that relative to those working in light intensity occupations (see Table A2 for categorization on the basis of MET values), the BMI of those in moderate intensity occupations is 0.37 kg/m^2 lower (not statistically significant) and the BMI of those in vigorous intensity occupation is a statistically significant 0.80 kg/m^2 lower. Those in moderate intensity occupations have a higher BMI relative to those in vigorous activity

[15] Using *Definition 2*, we find that relative to those working in high activity occupations, those in medium activity occupations have a statistically significant 0.42 kg/m^2 higher BMI (see column 6 in Table 2).

occupations although the difference is measured with error. The remaining columns of Table 2 repeat these specifications for the case of *Definition 2*. As is clear, the results are similar.

As a robustness check for our estimates that restrict the sample to the working population, we re-estimate columns 1, 2, 5 and 6 in Table 2 using the full sample of individuals that includes those who do not work. Labour Market Activity now has three possibilities: not working, employed in a white-collar occupation and employed in a blue-collar occupation. Activity now has four possibilities: not working, employed in a low activity occupation, employed in a medium activity occupation and employed in a high activity occupation. These results, which are reported in Table A4, resonate with the estimates in Table 2.[16] As mentioned above, we ensure that the sample of working women is not selected in terms of weight. For example, it is possible that heavy people may choose not to work and exit the labor market. Hence the sample of those who remain are non-random by virtue of such attrition. In this case, BMI in the first round will predict exit from work in the second round in our panel sample. Table A5 in the appendix presents the results from the regression of BMI in the first round of IHDS on withdrawal from the labour market in the second. As is clear, BMI in 2004–05 is not associated with exit from the labour market in 2011–2012; hence the sample of working women is not selected along this dimension.[17]

One concern with the specification defined in equation (1) is that labor market activity could be correlated with the unobserved determinants of BMI, that is, the sector of occupation is endogenous. This could be due to reverse causality as heavier women may choose more sedentary occupations or there could be unobserved variables affecting both BMI and labor market activity. For example, there might be individual specific unobserved heterogeneity: genetic or motivational disposition that affects both labor market engagement and weight. Examples of this include differences in (hard to quantify) metabolic rates between individuals that may affect weight, and through weight, may impact occupational choices made in the labor market.

[16] Since MET values are not defined for those not working, we report results only for sector of occupation.
[17] BMI data for men were only collected in IHDS2, so we are unable to run the corresponding regression for men.

In light of this, we conduct IV regressions that account for potential unobservables of this nature by instrumenting the sector of work (blue-collar or white-collar) and the intensity of work (measured by MET values). The instruments we use include the ability to speak English (fluently or moderately) and spouse's occupational activity level. Azam, et al. (2013) shows using the IHDS1 data set that the ability to speak English fluently (or even moderately) is strongly correlated with higher earnings. We contend that the ability to speak English fluently or moderately is positively correlated with the likelihood of working in a white-collar occupation.[18] Positive assortative matching in the marriage market implies that spouses often have similar levels of education, which implies that spouse's occupational activity level is likely to be correlated with the index individual's occupational level of activity (Siow (2015)).[19]

Our choice of instruments requires that we restrict the sample in the IV regressions to the married sample. While this slightly reduces the sample size, summary statistics for work patterns and BMI by sector of work, work activity and intensity of work remain similar to the full sample (see Panels A and B of Table A3 in the appendix). The OLS estimates of the effect of labor market engagement on BMI for those who are married are presented in columns 1 and 3 of Tables 3 and 4. A comparison of the corresponding columns in Tables 2 and 3 shows that while not identical, the estimates for the married and working sample are in the same ballpark as those for the working sample.

The IV results for women are presented in columns 2 and 4 in Panel A of Tables 3 (for sector of work) and 4 (for intensity of work). These IV estimates are larger than the corresponding OLS estimates, indicating that OLS underestimates the effect of occupational choice on BMI. The

[18] To account for the possibility that the ability to speak English has a direct effect on BMI, we included spoken English ability as an additional control in equation (1). After conditioning for labour market engagement and other covariates, the ability to speak English does not have a significant effect on BMI. These results are available on request.

[19] Spouse's occupational activity level is however unlikely to have a direct effect on the particular individual's BMI conditional on income, wealth and other household characteristics. To confirm that this is the case, we re-estimated equation (1) including this instrument as an additional explanatory variable. We find that after conditioning for labor market engagement and other observables, spouse's occupational activity level has no significant effect on BMI. Results available on request.

IV regression results in column 2 implies that relative to those working in white-collar occupations, working in a blue-collar occupation results in a 1.01 kg/m^2 or 4.12% decline in BMI.[20] This implies that on average there is a 2.7 kg or 6 pound change in BMI in the 6 years between the two IHDS surveys; a result that is plausible. The IV estimates in columns 2 and 4 of Table 4 are also larger compared to the corresponding OLS estimates in columns 1 and 3. A unit increase in MET results in a 0.51 kg/m^2 decrease in BMI under *Definition 1*. The IV estimate using *Definition 2* is also larger. We conclude that due to unobservable differences (in preferences or metabolic rates) that vary systematically between those who select into distinctive occupational sectors, OLS underestimates the effect of labor market engagement on BMI.[21]

5.2. Urban Working Males

The OLS regression results for the sample of working males aged 18 – 60 are presented in Panel B of Table 2 (columns 1–4 and 5–8 for *Definitions 1* and *2* respectively). These results are consistent with those for urban working females: column 1 of Table 2 shows that relative to those working in white-collar occupations, men working in blue-collar occupations have a 0.33 kg/m^2 lower BMI. Given that the average BMI for men employed in white-collar occupations is 24.20 kg/m^2, this implies that men employed in blue-collar occupations are 1.36% lighter. The results presented in column 2 imply that relative to those working in low activity occupations, men working in high activity occupations have a 2.05% lower BMI (difference is statistically significant). An increase in MET is associated with a systematic decline in BMI (column 3). However, consistent with the patterns presented in the Lowess plots for the relationship between BMI and intensity of occupation (Panel B of Figure 3), for high MET values, an increase in MET

[20] Table A6 in the appendix presents the first stage results. The coefficients on the instruments are of the expected sign and the reported first stage F-statistics are greater than the conventionally accepted threshold of 10 in both cases. This is corroborated by the Cragg-Donald Wald F-statistic which exceeds the 5% maximal IV relative bias (using the critical values defined by Stock and Yogo (2005)) both in column 1 and column 2. The Hansen J statistic is insignificant at 5% for all the specification which indicates that our IVs are valid.

[21] In unreported regressions we control for the share of total household expenditures on a range of diet related variables including sugar. Our key results (both OLS and IV) remain unaffected.

has a statistically zero impact on BMI. Relative to men working in light intensity occupations, although those in moderate intensity occupations have BMI that is 0.28 kg/m^2 lower, the coefficient for those in vigorous intensity occupations is positive but measured with error. Results for *Definition 2* for men echo these findings.

Consistent with the results for women, the IV regression results for men presented in columns 2 and 4 of Panel B of Tables 3 and 4 are larger than the corresponding OLS estimates, reflecting the negative bias in OLS.[22]

6. Conclusion and Policy Implications

Excess weight, generally considered a problem of richer countries, is a growing concern in many developing countries. It has been argued that reductions in physical activity commensurate with modest declines in energy intake are crucial factors that underline the rise in over-nutrition. Using data on labor market engagement and its intensity, this study shows that engagement in sedentary work is a crucial explanatory factor.

Decreasing employment in agriculture and a general trend towards a service sector economy imply lower physical occupational activity, a process that is occurring at a rapid pace in many developing countries (Monda, et al. (2007)). Technological innovations and growing incomes have made domestic activities and the work place irreversibly less active. From a health perspective, understanding the relationship between physical activity and excess weight is of considerable importance. However, empirical evidence on this relationship is limited. Our research bridges this gap by analyzing the relationship between physical strenuousness of work and BMI. Taking the potential endogeneity of labor market activity into account, we find that

[22] The IV estimates of men presented in column 2 and 4 of Tables 3 and 4 include only those with working spouses (wives). Since sample sizes in Tables 3 and 4 and those in Table 2 varied by a wide margin in this design, we ran the IV regressions for men such that they included non-working spouses. These results are presented in Table A7 in the appendix. It is clear that including non-working spouses increases the sample sizes, the IV results remain in the same range, and the first stage F- statistic exceeds the conventionally accepted threshold level. However, Hansen's *J* overidentification test is weaker now: we cannot reject at the 5% level in two cases.

being engaged in sedentary jobs is causally (positively) associated with increases in BMI for urban working adults.

Policies designed to tackle behavioral risk factors closely linked with excess weight, such as aspects of physical inactivity and diet, are indispensable. These policies may include communication programs that disseminate information on how grave the issue of overweight and obesity is, and spread awareness about the benefits of physical activity in daily routines. Examples include facilitating the ease of walking to work, encouraging the use of public transportation, or employer-sponsored subsidies for gym membership. In this regard, community wide campaigns may be a powerful tool (CDC (2011)).

Local governments can be key players in creating an environment which is more conducive to physical activities through their land use policies for example; these authorities can set requirements for builders to provide parks and recreational facilities in new developments. Lack of access to neighborhood parks, recreational facilities and lack of safety may deter women from being more physically engaged. Rectifying this could thus improve women's health. These are examples of some of the interventions which may serve to mitigate the unintended consequences of a torpid workplace.

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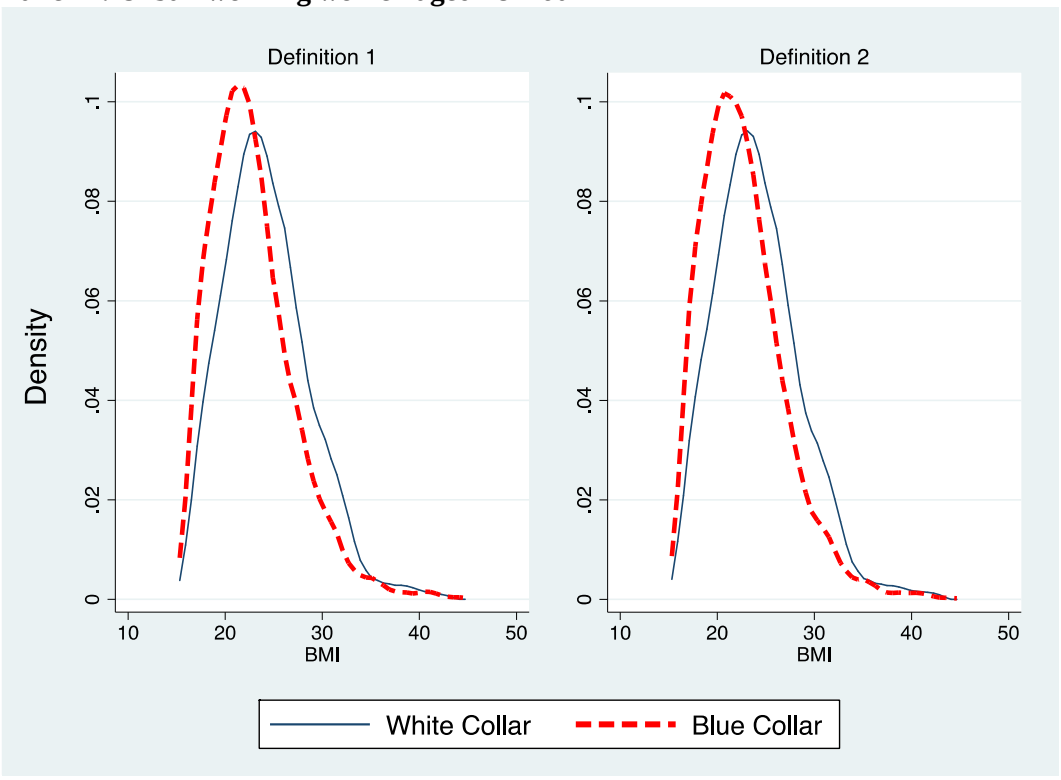
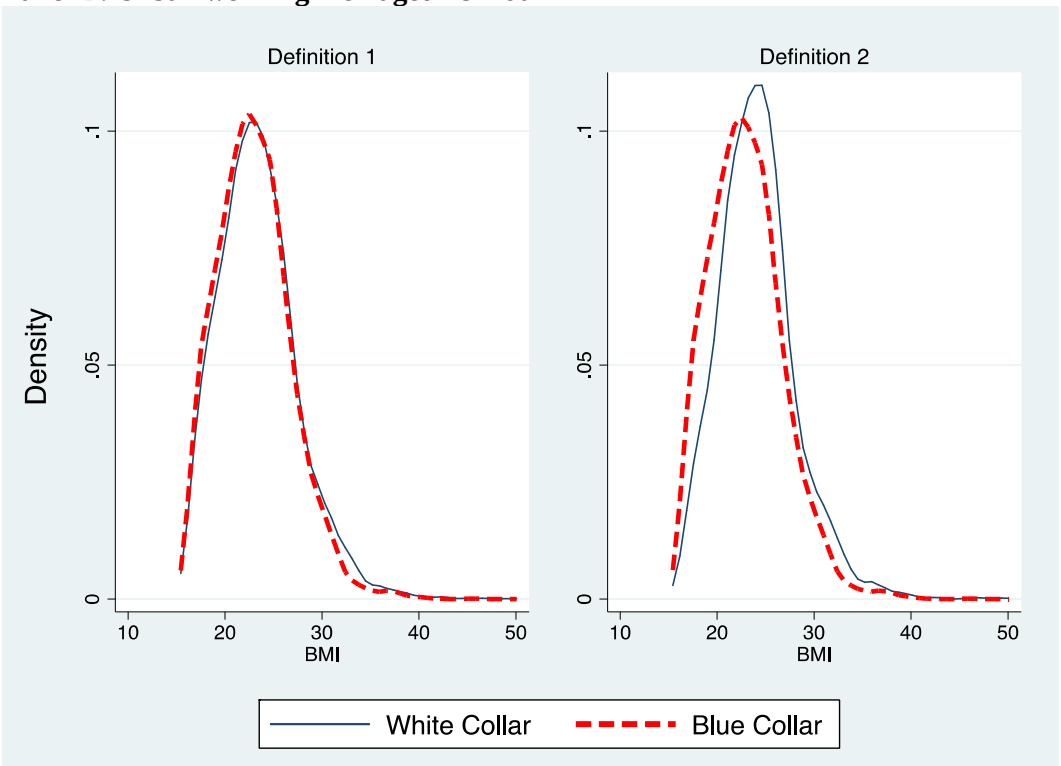
Figure 1: Distribution of BMI by sector of occupation.

Panel A: Urban working women aged 18 – 60

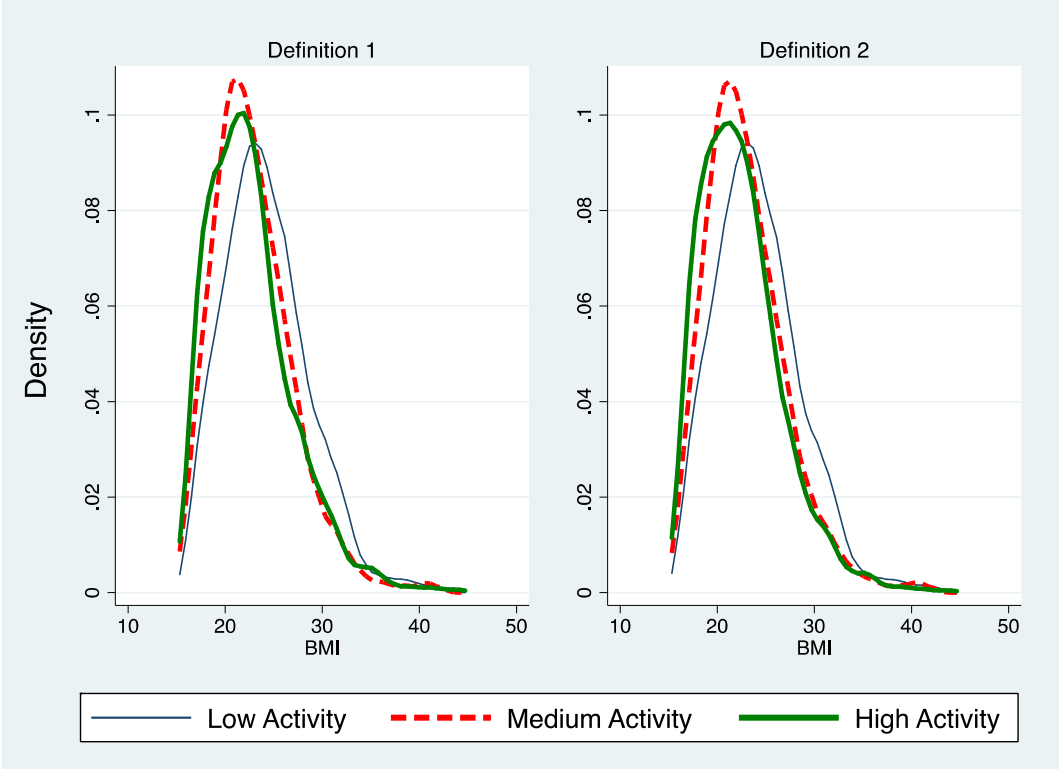


Panel B: Urban working men aged 18 – 60

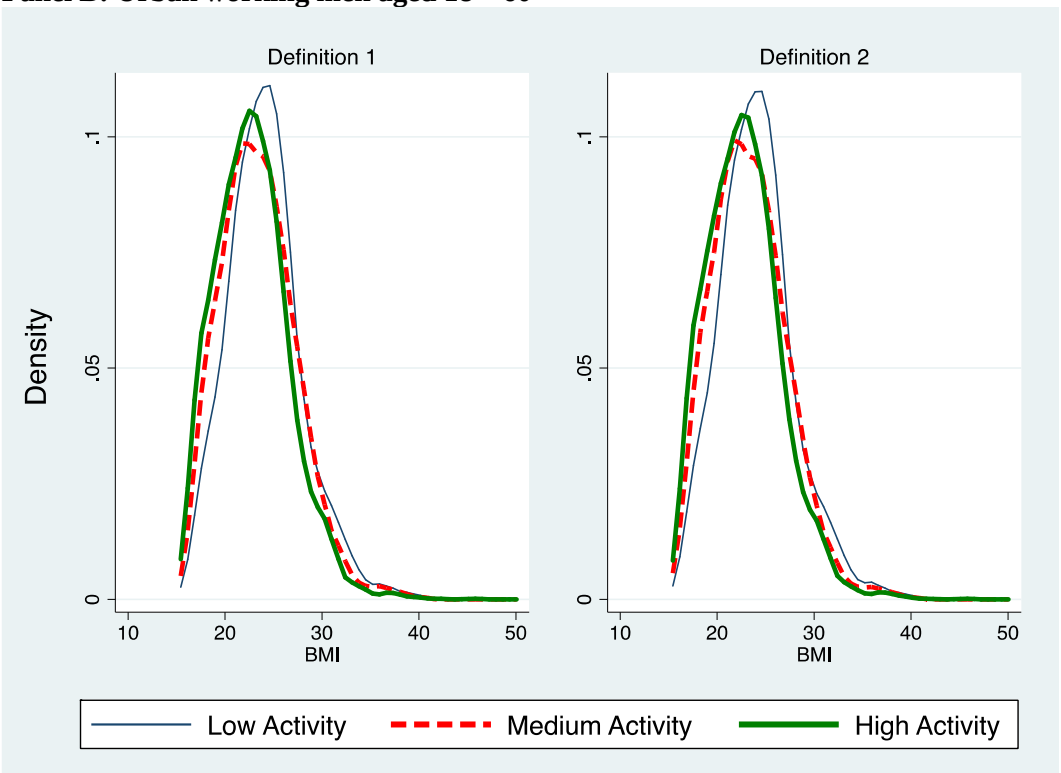


Notes: Sample in Panel A restricted to urban working women aged 18 – 60 in IHDS1 and IHDS2. In Panel B, sample is restricted to urban working men aged 18 – 60 in IHDS2.

Figure 2: Distribution of BMI by activity levels (defined by occupation)
Panel A: Urban working women aged 18 – 60

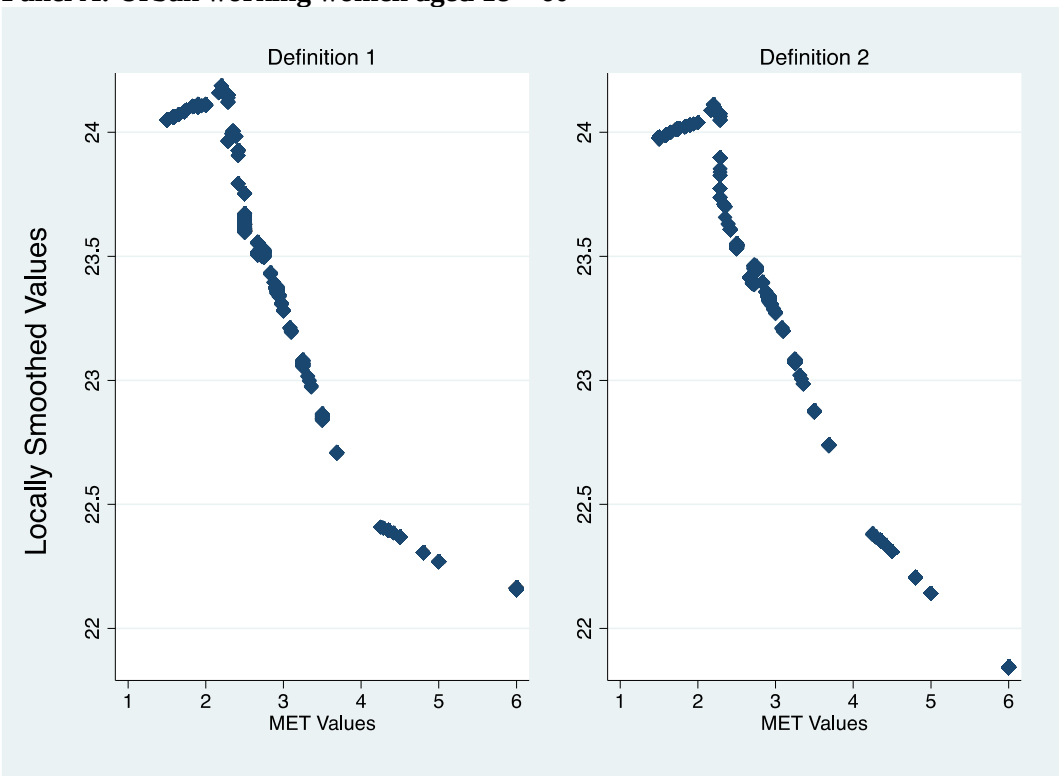


Panel B: Urban working men aged 18 – 60

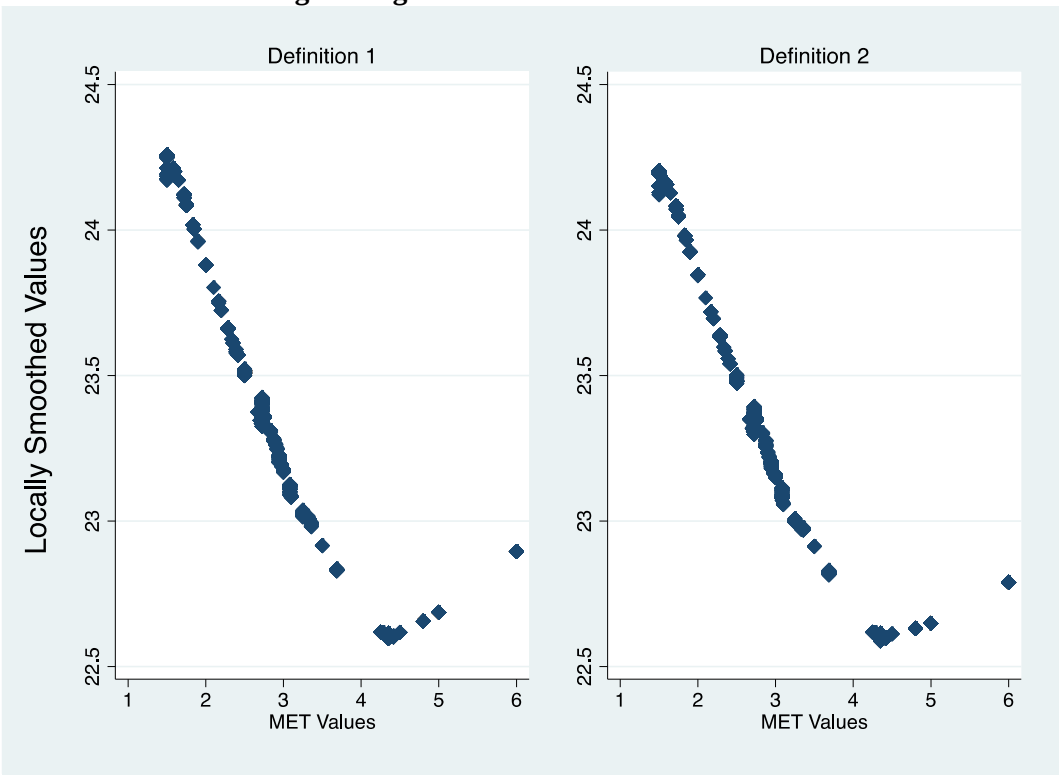


Notes: Sample in Panel A restricted to urban working women aged 18 – 60 in IHDS1 and IHDS2. In Panel B, sample is restricted to urban working men aged 18 – 60 in IHDS2.

Figure 3: Lowess plots of BMI on intensity of activity
Panel A: Urban working women aged 18 – 60

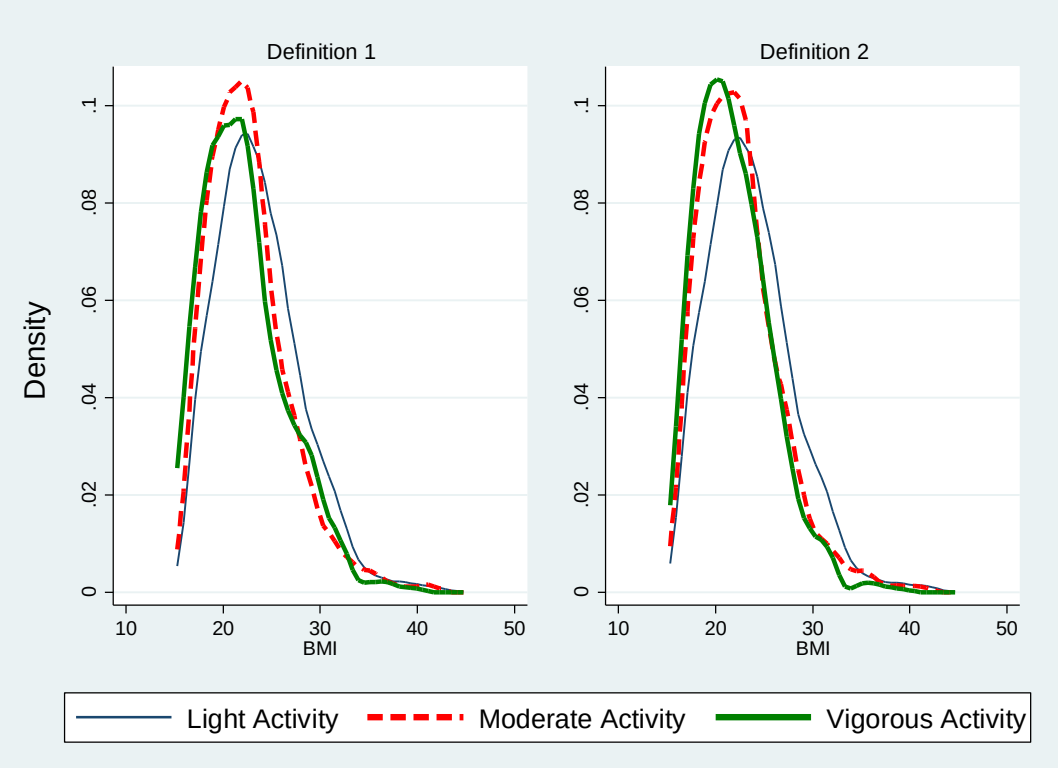


Panel B: Urban working men aged 18 – 60

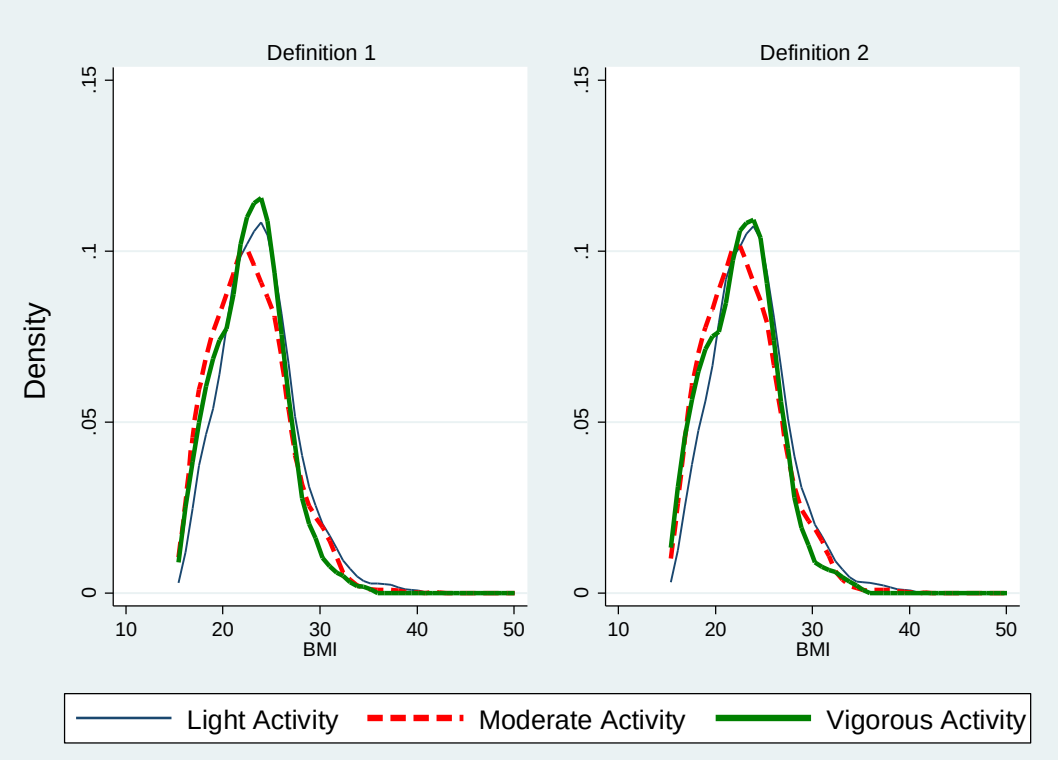


Notes: Sample in Panel A restricted to urban working women aged 18 – 60 in IHDS1 and IHDS2. In Panel B, sample is restricted to urban working men aged 18 – 60 in IHDS2.

Figure 4: Distribution of BMI by intensity of activity (defined by MET categories)
Panel A: Urban working women aged 18 – 60



Panel B: Urban working men Aged 18 – 60



Notes: Sample in Panel A restricted to urban working women aged 18 – 60 in IHDS1 and IHDS2. In Panel B, sample is restricted to urban working men aged 18 – 60 in IHDS2.

Table 1: Distribution of urban women by occupational groups and physical strenuousness of work

	Panel A		Panel B	
	Women Aged 18 – 60		Men Aged 18 – 60	
	Definition 1	*Definition 2*	*Definition 1*	*Definition 2*
	(1)	(2)	(3)	(4)
Occupation Category				
Blue Collar occupation	10.28	13.40	44.43	48.29
White Collar occupation	7.02	7.61	27.59	28.53
Occupation Category (Conditional on Working)				
Blue Collar occupation	59.43	63.78	61.69	62.86
White Collar occupation	40.57	36.22	38.31	37.14
Activity Level of Work (Conditional on Working)				
Low activity job	40.57	36.22	38.31	37.14
Medium activity job	23.85	20.97	20.30	20.03
High activity job	35.58	42.81	41.40	42.83
BMI (Conditional on Working)				
Blue Collar occupation	22.75	22.64	23.03	22.98
White Collar occupation	24.26	24.21	24.20	24.16
Low activity job	24.26	24.21	24.20	24.16
Medium activity job	22.92	22.98	23.46	23.39
High activity job	22.64	22.47	22.81	22.79
Intensity of Activity – MET (Conditional on Working)				
Activity: Light	69.77	63.82	71.68	70.32
Activity: Moderate	24.97	27.90	25.79	26.75
Activity: Vigorous	5.26	8.28	2.53	2.93
BMI (Conditional on Working)				
Activity: Light	23.73	23.68	23.75	23.70
Activity: Moderate	22.60	22.50	22.79	22.76
Activity: Vigorous	22.15	21.88	22.81	22.66

Notes: The sample in columns 1 and 2 includes urban women aged 18 – 60 in IHDS1 and IHDS2. The sample in columns 3 and 4 includes urban men aged 18 – 60 in IHDS2. In columns 5 – 8, the sample is restricted to those that are married. Table reports proportions except in the case of BMI where actual levels are reported.

Table 2: OLS regression of BMI on labour market intensity.

	Definition 1				*Definition 2*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Urban Working Women								
Blue Collar	-0.439**				-0.413*			
	(0.193)				(0.202)			
Medium Activity		-0.287				-0.133		
		(0.291)				(0.271)		
High Activity		-0.537***				-0.553***		
		(0.160)				(0.190)		
Physical intensity (in MET)			-0.261***				-0.250***	
			(0.060)				(0.061)	
Moderate Intensity				-0.373				-0.439*
				(0.225)				(0.243)
Vigorous Intensity				-0.796***				-0.762***
				(0.161)				(0.120)
Constant	13.926***	13.935***	14.357***	13.679***	13.265***	13.321***	13.841***	13.193***
	(0.982)	(0.998)	(1.018)	(0.904)	(1.104)	(1.115)	(1.102)	(1.022)
Difference: High – Medium Activity		-0.250				-0.420**		
		(0.216)				(0.188)		
Difference Vigorous – Moderate Intensity				-0.423				-0.323
				(0.302)				(0.210)
Sample size	3,743	3,743	3,743	3,743	4,574	4,574	4,574	4,574
Panel B: Urban Working Men								
Blue Collar	-0.334***				-0.335***			
	(0.117)				(0.111)			
Medium Activity		-0.066				-0.077		
		(0.122)				(0.128)		
High Activity		-0.496***				-0.483***		
		(0.138)				(0.129)		
Physical intensity			-0.116				-0.119*	
(in MET)			(0.072)				(0.066)	

Moderate Intensity				-0.279*				-0.275**
				(0.144)				(0.122)
Vigorous Intensity				0.221				0.057
				(0.326)				(0.278)
Constant	15.785***	15.759***	15.865***	15.588***	15.623***	15.609***	15.714***	15.419***
	(0.861)	(0.863)	(0.920)	(0.834)	(0.861)	(0.858)	(0.906)	(0.821)
Difference: High – Medium Activity		-0.430***				-0.405***		
		(0.136)				(0.140)		
Difference: Vigorous – Moderate				0.500				0.332
Intensity				(0.300)				(0.247)
Sample size	5,165	5,165	5,165	5,165	5,491	5,491	5,491	5,491

Notes: In Panel A, sample restricted to 18-60-year-old working urban women at the time of survey in IHDS1 and IHDS2. In Panel B, sample restricted to 18-60-year-old working urban men. The regressions include individual (age, age square, years of education, marital status, whether or not the individual consumes tobacco, number of children, the average number of hours spent watching television) and household level (dummies for wealth quartiles, whether or not the household has domestic help, whether the household owns a car or a motor cycle, household religions, the share of total expenditure on eating outside) controls, and a set of state dummies. The regressions in Panel A also include an IHDS2 year dummy. Standard errors clustered at the state level are in parenthesis. Significance: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table 3: IV regression of BMI on sector of work. Married sample.

	Definition 1		*Definition 2*	
	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)
Panel A: UrbanWorking Women Aged 18 – 60				
Blue collar	-0.553**	-1.008**	-0.499**	-0.825*
	(0.212)	(0.429)	(0.206)	(0.443)
Constant	13.920***		13.779***	
	(1.531)		(1.603)	
First Stage F-statistic		144.10		195.57
		[0.000]		[0.000]
Hansen's J χ^2 statistic		0.399		5.247
		[0.891]		[0.073]
Sample size	2,353	2,353	3,076	3,076
Panel B: Urban Working Men Aged 18 – 60				
Blue collar	-0.651**	-1.178***	-0.623***	-1.307***
	(0.247)	(0.391)	(0.188)	(0.472)
Constant	18.322***		17.656***	
	(2.755)		(3.422)	
First Stage F-statistic		59.10		77.20
		[0.000]		[0.000]
Hansen's J χ^2 statistic		1.339		1.199
		[0.512]		[0.549]
Sample size	802	802	1,025	1,025

Notes: In Panel A, sample restricted to 18-60-year-old working urban married women at the time of survey in IHDS1 and IHDS2. In Panel B, sample restricted to 18-60-year-old working urban married men. The regressions include individual (age, age square, years of education, marital status, whether or not the individual consumes tobacco, number of children, the average number of hours spent watching television) and household level (dummies for wealth quartiles, whether or not the household has domestic help, whether the household owns a car or a motor cycle, household religions, the share of total expenditure on eating outside) controls, and a set of state dummies. The regressions in Panel A also include an IHDS2 year dummy. English speaking ability and activity status of spouse (working spouses) are used as instruments. Standard errors clustered at the state level are in parenthesis. *p*-values are reported in square brackets. Significance: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table 4: IV regression of BMI on labour market intensity. Married sample.

	Definition 1		*Definition 2*	
	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)
Panel A: Urban Working Women Aged 18 – 60				
MET	-0.174***	-0.514**	-0.192***	-0.636***
	(0.059)	(0.223)	(0.064)	(0.185)
Constant	14.038***		14.147***	
	(1.504)		(1.678)	
First Stage F-statistic		50.13		46.05
		[0.000]		[0.000]
Hansen's J χ^2 statistic		1.429		2.124
		[0.489]		[0.346]
Sample size	2,353	2,353	3,076	3,076
Panel B: Urban Working Men Aged 18 – 60				
MET	-0.010	-0.651**	0.029	-0.632**
	(0.088)	(0.276)	(0.072)	(0.320)
Constant	17.911***		16.856***	
	(2.805)		(3.571)	
First Stage F-statistic		30.31		46.09
		[0.000]		[0.000]
Hansen's J χ^2 statistic		1.541		1.886
		[0.462]		[0.389]
Sample size	802	802	1,025	1,025

Notes: In Panel A, sample restricted to 18-60-year-old working urban married women at the time of survey in IHDS1 and IHDS2. In Panel B, sample restricted to 18-60-year-old working urban married men. The regressions include individual (age, age square, years of education, marital status, whether or not the individual consumes tobacco, number of children, the average number of hours spent watching television) and household level (dummies for wealth quartiles, whether or not the household has domestic help, whether the household owns a car or a motor cycle, household religions, the share of total expenditure on eating outside) controls, and a set of state dummies. The regressions in Panel A also include an IHDS2 year dummy. English speaking ability and activity status of spouse are used as instruments. Standard errors clustered at the state level are in parenthesis. *p*-values are reported in square brackets. Significance: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

ONLINE APPENDIX

Table A1: Categorization into type of occupation and physical activity level

Categorization	Occupational Groups
Type of Occupation	
White collar jobs (non-manual jobs)	Professional, technical, and related workers, administrative, executive, and managerial workers, clerical and related workers♣
Blue collar jobs (manual jobs)	Sales workers, Service workers, workers in transport and communications, Farmers, fishermen, hunters, loggers and related workers, Production and related workers ♣
Physical activity level	
Low (same as white collar jobs)	Professional, technical, and related workers, administrative, executive, and managerial workers, clerical and related workers*
Medium	Sales workers, service workers and workers in transport and communications *
High	Farmers, fishermen, hunters, loggers and related workers, production, and related workers*

Notes: ♣: Occupations coded 00 – 36, 39, 40, 41, 42, 44 and 45 as per NCO 1968 were categorized as white-collar jobs. Occupations coded as 37, 38, 49, 43 and 50 – 99, as per NCO 1968 were categorized as blue-collar jobs.
*: Occupations coded 00 – 36, 39, 40, 41, 42, 44, 45 as per NCO 1968 were categorized as low activity jobs. This is same as white collar jobs described above. Occupations coded as 37, 38, 43, 49, 86, 98 and 50 – 59 as per NCO 1968 were categorized medium activity jobs. Occupations coded 60 – 85, 87 – 97 and 99 as per NCO 1968 were categorized as high activity jobs.

Table A2: MET values of occupation

Two- digit occupation code	Occupations	Two- digit MET value	Activity classification
00	Physical Scientists	1.80	Light
01	Physical Science Technicians	2.50	Light
02	Architects, Engineers, Technologists and Surveyors	1.60	Light
03	Engineering Technicians	2.39	Light
04	Aircraft and Ships Officers	2.00	Light
05	Life Scientists	2.10	Light
06	Life Science Technicians	2.50	Light
07	Physicians and Surgeons (Allopathic Dental and Veterinary Surgeons)	2.35	Light
08	Nursing and other Medical and Health Technicians	2.42	Light
09	Scientific, Medical and Technical Persons, Other	2.50	Light
10	Mathematicians, Statisticians and Related Workers	1.50	Light
11	Economists and Related Workers	1.50	Light
12	Accountants, Auditors and Related Workers	1.50	Light
13	Social Scientists and Related Workers	1.94	Light
14	Jurists	1.50	Light
15	Teachers	2.50	Light
16	Poets, Authors, Journalists and Related Workers	1.50	Light
17	Sculptors, Painters, Photographers and Related Creative Artists	3.00	Light
18	Composers and Performing Artists	2.33	Light
19	Professional Workers, NEC	2.20	Light
20	Elected and Legislative Officials	1.50	Light
21	Administrative and Executive Officials Government and Local Bodies	2.00	Light
22	Working Proprietors, Directors and Managers, Wholesale and Retail Trade	1.50	Light
23	Directors and Managers, Financial Institutions	1.50	Light
24	Working Proprietors, Directors and Managers Mining, Construction, Manufacturing and Related Concerns	1.90	Light
25	Working Proprietors, Directors, Managers and Related Executives, Transport, Storage and Communication	1.50	Light
26	Working Proprietors, Directors and Managers, Other Service	1.58	Light
29	Administrative, Executive and Managerial Workers, NEC	1.50	Light
30	Clerical and Other Supervisors	1.75	Light
31	Village Officials	1.50	Light
32	Stenographers, Typists and Card and Tape Punching Operators	1.65	Light
33	Book-keepers, Cashiers and Related Workers	1.75	Light
34	Computing Machine Operators	1.50	Light
35	Clerical and Related Workers, NEC	1.72	Light

36	Transport and Communication Supervisors	2.17	Light
37	Transport Conductors and Guards	2.00	Light
38	Mail Distributors and Related Workers	3.33	Moderate
39	Telephone and Telegraph Operators	1.50	Light
40	Merchants and Shopkeepers, Wholesale and Retail Trade	1.50	Light
41	Manufacturers, Agents	1.75	Light
42	Technical Salesmen and Commercial Travellers	2.00	Light
43	Salesmen, Shop Assistants and Related Workers	2.50	Light
44	Insurance, Real Estate, Securities and Business Service Salesmen and Auctioneers	1.83	Light
45	Money Lenders and Pawn Brokers	1.50	Light
49	Sales Workers, NEC	2.50	Light
50	Hotel and Restaurant Keepers	2.00	Light
51	House Keepers, Matron and Stewards (Domestic and Institutional)	3.50	Moderate
52	Cooks, Waiters, Bartenders and Related Worker (Domestic and Institutional)	2.75	Light
53	Maids and Other House Keeping Service Workers NEC	4.50	Moderate
54	Building Caretakers, Sweepers, Cleaners and Related Workers	3.25	Moderate
55	Launderers, Dry-cleaners and Pressers	2.67	Light
56	Hair Dressers, Barbers, Beauticians and Related Workers	2.50	Light
57	Protective Service Workers	2.83	Light
59	Service Workers, NEC	2.67	Light
60	Farm Plantation, Dairy and Other Managers and Supervisors	3.00	Moderate
61	Cultivators	4.8	Moderate
62	Farmers other than cultivators	4.28	Moderate
63	Agricultural Labourers	6.00	Vigorous
64	Plantation Labourers and Related Workers	6.00	Vigorous
65	Other Farm Workers	3.25	Moderate
66	Forestry Workers	5.00	Moderate
67	Hunters and Related Workers	3.00	Moderate
68	Fishermen and Related Workers	5.00	Moderate
71	Miners, Quarrymen, Well Drillers and Related Workers	4.25	Moderate
72	Metal Processors	2.98	Light
73	Wood Preparation Workers and Paper Makers	2.92	Light
74	Chemical Processors and Related Workers	2.71	Light
75	Spinners, Weavers, Knitters, Dyers and Related Workers	2.73	Light
76	Tanners, Fellmongers and Pelt Dressers	3.25	
77	Food and Beverage Processors	2.70	Light
78	Tobacco Preparers and Tobacco Product Makers	2.92	Light
79	Tailors, Dress Makers, Sewers, Upholsterers and Related Workers	2.29	Light

80	Shoe makers and Leather Goods Makers	2.50	Light
81	Carpenters, Cabinet and Related Wood Workers	3.43	Moderate
82	Stone Cutters and Carvers	2.83	Light
83	Blacksmiths, Tool Makers and Machine Tool Operators	3.31	Moderate
84	Machinery Fitters, Machine Assemblers and Precision Instrument	3.08	Moderate
85	Electrical Fitters and Related Electrical and Electronic Workers	2.94	Light
86	Broadcasting Station and Sound Equipment Operators and Cinema Projectionists	2.00	Light
87	Plumbers, Welders, Sheet Metal and Structural Metal Preparers and Erectors	4.42	Moderate
88	Jewellery and Precious Metal Workers and Metal Engravers (Except Printing)	1.50	Light
89	Glass Formers, Potters and Related Workers	2.50	Light
90	Rubber and Plastic Product Makers	3.10	Moderate
91	Paper and Paper Board Products Makers	2.83	Light
92	Printing and Related Workers	1.85	Light
93	Painters	2.88	Light
94	Production and Related Workers, NEC	2.90	Light
95	Bricklayers and Other Constructions Workers	4.35	Moderate
96	Stationery Engines and Related Equipment Operators, Oilers and Greasors	3.10	Moderate
97	Material Handling and Related Equipment Operators, Loaders and Unloaders	3.69	Moderate
98	Transport Equipment Operators	2.73	Light
99	Labourers NEC	5.00	Moderate

Notes: Met values are matched using Tudor-Locke *et al*. (2011). For occupation codes 61, 62 and 66 we use https://sites.google.com/site/compendiumofphysicalactivities/Activity-Categories/occupation (accessed on August 30, 2017).

Table A3: Distribution of urban women by occupational groups and physical strenuousness of work.

	Panel A		Panel B	
	Married Women Aged 18 – 60		Married Men Aged 18 - 60	
	Definition 1	*Definition 2*	*Definition 1*	*Definition 2*
	(1)	(2)	(3)	(4)
Occupation Category				
Blue Collar occupation	8.93	12.10	51.49	55.09
White Collar occupation	6.42	6.99	31.74	32.46
Occupation Category (Conditional on Working)				
Blue Collar occupation	58.17	63.39	61.86	62.92
White Collar occupation	41.83	36.61	38.14	37.08
Activity Level of Work (Conditional on Working)				
Low activity job	41.83	36.61	38.14	37.08
Medium activity job	21.25	18.32	20.37	20.01
High activity job	36.92	45.07	41.49	42.91
BMI (Conditional on Working)				
Blue Collar occupation	22.72	22.59	23.25	23.26
White Collar occupation	24.50	24.43	24.45	24.44
Low activity job	24.50	24.43	24.44	24.45
Medium activity job	22.86	22.89	23.74	23.69
High activity job	22.64	22.46	23.03	23.05
Intensity of Activity – MET (Conditional on Working)				
Activity: Light	71.56	64.14	71.46	70.14
Activity: Moderate	23.21	27.16	25.78	26.66
Activity: Vigorous	5.23	8.70	2.76	3.20
BMI (Conditional on Working)				
Activity: Light	23.87	23.83	24.00	24.00
Activity: Moderate	22.55	22.40	22.99	23.01
Activity: Vigorous	21.99	21.77	22.87	22.82

In columns 1 – 4, the sample is restricted to those that are married working sample. Table reports proportions except in the case of BMI where actual levels are reported.

Table A4: OLS regression of BMI on labour market intensity. All urban women and men.

	Definition 1		*Definition 2*	
	(1)	(2)	(3)	(4)
Panel A: All Urban Women Aged 18 – 60				
White Collar	-0.222		-0.264	
	(0.182)		(0.165)	
Blue Collar	-0.565***		-0.718***	
	(0.115)		(0.124)	
Low Activity		-0.222		-0.263
		(0.182)		(0.165)
Medium Activity		-0.396*		-0.400**
		(0.223)		(0.192)
High Activity		-0.677***		-0.873***
		(0.137)		(0.148)
Constant	11.121***	11.123***	11.116***	11.131***
	(0.690)	(0.692)	(0.693)	(0.697)
Difference: Blue – White	-0.343**		-0.454***	
	(0.157)		(0.136)	
Difference: Medium – Low Activity		-0.174		-0.137
		(0.273)		(0.234)
Difference: High – Low Activity		-0.455***		-0.610***
		(0.156)		(0.145)
Difference: High – Medium Activity		-0.281		-0.473*
		(0.271)		(0.236)
Sample Size	22,584	22,584	22,584	22,584
Panel B: All Urban Men Aged 18 – 60				
White Collar	0.098		0.046	
	(0.190)		(0.167)	
Blue Collar	-0.228**		-0.299***	
	(0.105)		(0.091)	
Low Activity		0.101		0.047
		(0.190)		(0.168)
Medium Activity		0.052		-0.031
		(0.139)		(0.136)
High Activity		-0.385***		-0.448***
		(0.120)		(0.101)
Constant	14.330***	14.323***	14.338***	14.337***
	(0.804)	(0.807)	(0.777)	(0.778)
Difference: Blue – White	-0.326**		-0.345***	
	(0.120)		(0.111)	
Difference: Medium – Low Activity		-0.049		-0.078
		(0.135)		(0.141)
Difference: High – Low Activity		-0.486***		-0.494***
		(0.137)		(0.122)
Difference: High – Medium Activity		-0.438***		-0.416***
		(0.140)		(0.141)
Sample Size	7,193	7,193	7,193	7,193

Notes: In Panel A, sample restricted to 18-60-year-old urban women at the time of survey in IHDS1 and IHDS2. In Panel B, sample restricted to 18-60-year-old urban men. The regressions include individual (age, age square, years of education, marital status, whether or not the individual consumes tobacco, number of children, the average number of hours spent watching television) and household level (dummies for wealth quartiles, whether or not the household has domestic help, whether the household owns a car or a motor cycle, household religions, the share of total expenditure on eating outside) controls, and a set of state dummies. The regressions in Panel A also include an IHDS2 year dummy. Standard errors clustered at the state level are in parenthesis. Significance: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table A5: OLS regression of BMI in the first round of IHDS on withdrawal from the labour market in the second round of IHDS.

	Definition 1	*Definition 2*
	(1)	(2)
All Urban Working Women in 2004-05.		
BMI in 2004-05	0.003	0.001
	(0.005)	(0.004)
Constant	1.160**	0.476*
	(0.420)	(0.258)
Sample size	884	1,163

Notes: Sample restricted to urban working women aged 18 and above at the time of survey in IHDS1, but aged less than 60 at the time of survey in IHDS2. The dependent variable takes value 1 if a woman stopped working in IHDS2, and takes value 0 if she continue to work in IHDS2. The regressions include IHDS1 individual (age, age square, years of education, marital status, whether or not the individual consumes tobacco, number of children, the average number of hours spent watching television) and household level (dummies for wealth quartiles, whether or not the household has domestic help, whether the household owns a car or a motor cycle, household religions, the share of total expenditure on eating outside) controls, and a set of state dummies. Standard errors clustered at the state level are in parenthesis. Significance: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table A6: First stage results.

	Blue collar job		MET	
	Definition 1	**Definition 2**	**Definition 1**	**Definition 2**
	(1)	(2)	(3)	(4)
Panel A: Urban Married Working Women Aged 18 – 60				
Spoken English (Moderate or Fluent)	-0.114***	-0.142***	0.114*	0.047
	(0.036)	(0.030)	(0.065)	(0.085)
Spouse employed in Medium Activity	0.319***	0.318***	0.325***	0.342***
	(0.022)	(0.022)	(0.044)	(0.051)
Spouse employed in High Activity	0.373***	0.371***	0.750***	0.836***
	(0.021)	(0.023)	(0.065)	(0.072)
First Stage F-statistic	144.10	195.57	50.13	46.05
	[0.000]	[0.000]	[0.000]	[0.000]
Hansen's J χ^2statistic	0.399	5.247	1.429	2.124
	[0.891]	[0.073]	[0.489]	[0.346]
Sample size	2,353	3,076	2,353	3,076
Panel B: Urban Married Working Men Aged 18 – 60				
Spoken English (Moderate or Fluent)	-0.059**	-0.068**	-0.048	-0.084
	(0.029)	(0.029)	(0.074)	(0.071)
Spouse employed in Medium Activity	0.421***	0.417***	0.563***	0.460***
	(0.038)	(0.031)	(0.109)	(0.106)
Spouse employed in High Activity	0.465***	0.436***	0.913***	0.849***
	(0.035)	(0.028)	(0.096)	(0.083)
First Stage F-statistic	59.10	77.20	30.31	46.09
	[0.000]	[0.000]	[0.000]	[0.000]
Hansen's J χ^2 statistic	1.339	1.199	1.541	1.886
	[0.512]	[0.549]	[0.462]	[0.389]
Sample size	802	1,025	802	1,025

Notes: In Panel A, Sample restricted to 18-60-year-old married working urban women at the time of survey. In Panel B, sample restricted to 18-60-year-old married working urban men. The regressions include individual (age, age square, years of education, marital status, whether or not the individual consumes tobacco, number of children, the average number of hours spent watching television) and household level (dummies for wealth quartiles, whether or not the household has domestic help, whether the household owns a car or a motor cycle, household religions, the share of total expenditure on eating outside) controls, and a set state dummies. The regressions in Panel A also include an IHDS2 year dummy. English speaking ability and activity status of spouse are used as instruments. Standard errors clustered at the state level are in parenthesis. *p*-values are reported in square brackets. Significance: * $p<0.10$, ** $p<0.05$, *** $p<0.00$.

Table A7: IV regression of BMI on labour market intensity. Urban married men sample with working and non-working spouses.

	Definition 1		*Definition 2*	
	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)
Panel A: Urban Working Men Aged 18 – 60				
Blue collar	-0.309***	-2.145***	-0.332***	-2.330***
	(0.091)	(0.661)	(0.073)	(0.770)
Constant	17.253***		17.158***	
	(0.961)		(0.909)	
First Stage F-statistic		58.18		77.38
		[0.000]		[0.000]
Hansen's *J* Chi-squared statistic		7.776		7.013
		[0.051]		[0. 071]
Sample size	4,264	4,264	4,463	4,463
Panel B: Urban Working Men Aged 18-60				
MET	-0.103	-0.900***	-0.096	-0.943***
	(0.067)	(0.303)	(0.060)	(0.314)
Constant	17.323***		17.188***	
	(1.026)		(0.982)	
First Stage F-statistic		28.75		55.16
		[0.000]		[0.000]
Hansen's *J* Chi-squared statistic		8.068		7.161
		[0.044]		[0.067]
Sample size	4,264	4,264	4,463	4,463

Notes: In Panel A, sample restricted to 18-60-year-old working urban married men. The regressions include individual (age, age square, years of education, marital status, whether or not the individual consumes tobacco, number of children, the average number of hours spent watching television) and household level (dummies for wealth quartiles, whether or not the household has domestic help, whether the household owns a car or a motor cycle, household religions, the share of total expenditure on eating outside) controls, and a set of state dummies. English speaking ability and activity status of spouse (including non-working spouses as well) are used as instruments. Standard errors clustered at the state level are in parenthesis. *p*-values are reported in square brackets. Significance: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.