Labor Market Engagement and the Body Mass Index of Working Adults: Evidence from India[ǂ]

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Abstract

Galvanized by rapid income growth, labor market transitions in the nature of jobs, and lifestyle factors, there has been an increase in rates of obesity in many developing countries. This paper examines the relationship between BMI and sector and physical intensity of work among urban adults in India. We document that BMI is positively and significantly associated with labor market inactivity. Women in white-collar work have about 1.01 kg/m^2 higher BMI than women in blue-collar work. For working men, the comparable estimate is approximately 1.18 kg/m^2. We find that the increase in overall BMI originates from those who are already at high levels of BMI. Further, relative to the non-working sample, employment in a blue-collar occupation is associated with a BMI penalty for men and women. We find suggestive evidence that the increase in BMI for women is driven by a decline in energy expenditure, while both a decrease in energy expenditure and an increase in energy intake are important in explaining BMI dynamics for men. These results are robust to a variety of specification and methodological checks, and suggest that the increasing trend in BMI may be attributed to the transition towards a more sedentary occupational structure. Overall our research underlines the important role played by occupational engagement in determining the general health of populations in developing countries.

Key Words: BMI, Overweight or Obese, Labor Market Sector, Physical Intensity, Gender, India

JEL Codes: I12, I15, O12

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1. Introduction

A striking global health trend in the recent past has been the rapid increase in the proportion of the population that is overweight or obese. This is true in both developed and developing countries. Excess weight is increasingly viewed as a global pandemic, with more obese people than under-weight in the world today. Indications are that this problem is going to worsen, further contributing to the global burden of disease.

Using data from India, this paper examines the association between occupational activity and body mass index (BMI) among urban working Indians. India has experienced high rates of economic growth in the last two decades, and the resultant increase in income is related to a rise in the proportion of the population that is overweight or obese. India currently has the third highest number of overweight or obese individuals among all countries, with 20% of adults and 11% of adolescents characterized as belonging in this category (Lancet (2014)). We measure occupational activity by sector and intensity of work in this research, and focus on the association between labor market engagement and BMI in order to understand why rates of overweight or obese have been rising over time in India.[1] We study urban residents as prior research shows that the phenomenon of excess BMI is especially pronounced in urban India (Maitra and Menon (2018)). Tailoring measures of labor market engagement to reflect the structure of occupations specific to India, this paper provides new evidence on the association between BMI and sector and intensity of work in a country where the number of over-nourished people is increasing dramatically.

This topic is of particular relevance as unhealthy levels of BMI are positively correlated with chronic health risks like hypertension and diabetes, diseases that can have substantial impacts on household budgets. Engelgau, et al. (2012) argue 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 with a heart disease patient are estimated to spend up to a third of their annual income on health.

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

Continuing with a review of literature, previous research has tended to focus on the dynamics of energy-intake and energy-expenditure in determining BMI. An increase in BMI may be the result of high intake of energy or low expenditure of energy or both (Roberts and Leibel (1998)). Cutler, et al. (2003) argue that the main reason for the increase in obesity rates in the US over the last quarter century is the increase in calorie consumption. Using data from Japan, Maruyama and Nakamura (2018) find that both energy intake and energy expenditure have significantly decreased for Japanese adult men and women, and that a larger reduction in energy expenditure among men than women accounts for the increasing male-to-female BMI gap (observed persistent increase in BMI for men and a decrease in BMI for women). This result is applicable to India where evidence indicates that there has been a secular decline in average energy intake (Deaton and Drèze (2009), Ramachandran (2014)). Since rates of overweight or obesity have continued to rise in India despite this fact, we examine the association between BMI and energy expenditure resulting from sector and physical strenuousness (or intensity) of work to shed further light on this question.

Another direction that has been pursued in recent work has been the effect on BMI of the type of occupation. In the context of studies with designs where the results may be interpreted as causal, evidence suggests a strong and significant effect of energy expenditure at work on BMI. This literature also finds that there are considerable differences by gender. Lakdawalla and Philipson (2007), using US data, find that job-related exercise reduces weight for men, and the impacts are largest for those at the upper tail of the weight distribution. Lakdawalla and Philipson (2009), also using data from the US, find that a woman who spends one year in the least physically demanding job has significantly higher weight as compared to a woman who spends a year in the most physically demanding job. Godard (2016) shows that decreases in work related physical activity leads to increases in obesity rates. Sarma, et al. (2014), using data from Canada, find that both leisure time physical activity and work related physical activity are associated with a reduction in BMI, and the effects are stronger for women than for men. Gender-disaggregated impacts are also found in Abramowitz (2016) where the effect on BMI of time spent in work is most pronounced in non-strenuous jobs. Observational studies using data from a number of developed countries also document a consistent link between BMI status and physical activity at work (see for example Ishizaki, et al. (2004), Bockerman, et al. (2008), Choi, et al. (2010) and Church, et al. (2011)). An exception is He and Baker (2004) who find no association between light or vigorous physical activity in the workplace and changes in BMI in the US.

The negative relationship between the physical strenuousness of work and BMI has been observed in a number of developing countries as well. Colchero, et al. (2008) using longitudinal data from the Philippines finds that relative to women employed in heavy physical activity occupations, those in low and medium physical activity occupations have 0.29 and 0.12 kg/m^2 higher BMI, respectively. Adair (2004), also using data from the Philippines, shows that improvements in socioeconomic status, a reduction in the number of hours worked, and urban residence, were all systematically positively correlated with an increase in BMI over-time. Similar results have been obtained from China. Paeratakul, et al. (1998) finds that women employed in physically intense occupations had 0.42 kg/m^2 lower BMI than women in relatively less physically strenuous jobs; Bell, et al. (2001) finds that both men and women engaged in low and moderate physical activity at work experienced larger weight gains (>5kg) as compared to women engaged in heavy physical activity. These studies underscore the importance of accounting for occupation-related energy expenditure in understanding the determinants of BMI.

Our paper adds to the fairly limited evidence on the link between labor market work and the health of those employed in developing countries. While we use data from India to document our main arguments, our results are generalizable to other advancing countries by virtue of the fact that India is representative of the dynamics of high BMI levels, and important in terms of the excess-weight – income nexus. More specifically, we build on the existing literature that uses information from developing countries in two meaningful ways. First, by demonstrating that occupational activity levels are importantly associated with BMI, we offer an explanation for the puzzling situation in India where increases in BMI co-exist with overall declines in average energy intake levels. Although intake levels may have declined, the general trend towards a more sedentary occupational structure that has accompanied structural transformation in the country is associated with increases in BMI. Second, this research is the first to create a mapping of occupations and metabolic equivalent values (MET) in India. This allows us to provide a more comprehensive measure of the intensity of work profiles (captured by the METs) in the country than has been done before. The use of MET values is a robust and powerful tool to measure energy expenditure levels at work in India than has hitherto been formulated and analyzed.

We briefly summarize the key results of our research before concluding this section. First, we find that being employed in a low activity occupation is associated with significantly higher BMI when we do not add controls. This association remains significant even after controlling for demographic characteristics, education, socio-economic status, and various other household characteristics. In particular, women employed in white-collar work have approximately 1.01 kg/m^2 higher BMI than women in blue-collar work. The corresponding estimate for men in white-collar work is 1.18 kg/m^2. We find comparable results when we evaluate the relationship between BMI and the physical intensity of work. These results indicate that growth in the incidence of overweight is driven by structural transformation over time which has led to a relative reduction in physically-exertive jobs (blue-collar work). Second, quantile methods reveal that much of the increase in BMI is concentrated in the upper tail of the distribution. That is, the overall increase in BMI may be broadly attributed to those who are already at high levels of BMI, and not to those who are at more healthy levels. This suggests that the aggregate distribution of BMI may be widening in India over time. Third, relative to not working, employment in a blue-collar occupation (but not in a white-collar occupation) is associated with a statistically significant BMI deficit for men and women. Finally, our analysis of caloric intake reveals that energy expenditure is an important driver of aggregate BMI effects for women. For men however, both calorie intake and energy expenditure appear to be important.

2. Data and Construction of the Estimation Sample

Our analysis is conducted using data from two waves of the India Human Development Survey (IHDS) conducted in 2004–05 (referred to as IHDS1 from now on) and 2011–12 (referred to as IHDS2 from now on). This is a nationally representative, multi-topic survey of 41,554 households in 1,503 villages and 971 urban neighborhoods across India collected by the National Council of Applied Economic Research and the University of Maryland. The rural sample in IHDS1 was collected using stratified random sampling techniques, whereas the urban sample was a stratified sample of cities and towns in states chosen using probability proportional to population methods. India had 593 districts in 2001 and IHDS1 included representative data from 384 of them. Around 83% of the households were re-interviewed in 2011–2012 for the second wave of the survey (IHDS2) based on the same sampling design as IHDS1. This 83% includes original households and split households located in the same village. IHDS2 included a further 2,134 households in urban areas and in some rural areas of the northeastern states of India to compensate for households that had moved permanently. The final sample for IHDS2 is representative of 384 districts spanning over 1400 villages and over 1000 urban blocks.[2] The IHDS data has specific weights in each round that reflect the corresponding sampling techniques, and clear instructions on which particular weight variables are to be used in order to make sample estimates representative of population characteristics. All regressions we implement are weighted by the appropriate weight variables. The IHDS data are of high quality and unique in the breadth of topics covered and the integrity of the anthropometric information collected, which is important from our perspective. Further, the response rate is more than 90% in each wave.

The survey collected information on health, education, employment, economic status, marriage, fertility, gender relations, and social capital. However, while both rounds of the survey collected anthropometric data for women, the corresponding data for men was collected systematically only in IHDS2. We concentrate on the cross-sectional aspect of the data by using

[2] See https://www.icpsr.umich.edu/icpsrweb/content/DSDR/idhs-II-data-guide.html for more details.

both rounds for women and IHDS2 for men, and utilize the panel aspect of the data for women mainly to examine the robustness of our key results (see Section 5.4 for more details).[3]

Our key dependent variable is BMI, defined as the ratio of weight (in kilograms) to height (in meters) squared. BMI may be used to categorize individuals into broad groupings: 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).

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.[4] 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.[5] 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

[3] Panel estimations require sufficient variation in both BMI and labor market engagement over the rounds for identification. Given the relatively short gap between the two rounds, there is not a great deal of change in occupation across rounds. Moreover, there is considerable persistence in BMI across rounds. Roemling and Qaim (2013) also do not use the panel aspect of the Indonesian data for similar reasons.

[4] Within the wage/salary category, there are individuals who report working in more than one job. IHDS2 collected information on number of days worked, hours worked in a day, and type of occupation for all jobs an individual is engaged in. IHDS1 collected 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. In consequence, we drop 136 men and 84 women in the IHDS2 data and 19 women in the IHDS1 data to arrive at our estimating sample.

[5] If a household had more than one type of business, information on the other type was 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 multiplied the days worked in the preceding year in that activity by the (average) hours spent in a day on that activity.

Surveys of India (NSS), the most widely used source of employment statistics in the country.[6] We also use a second definition of work: in this definition, 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). Since *Definition 1* is closer to the more commonly used definition of being employed in India, we focus on results using this definition. Results from *Definition 2* are presented in the Appendix. Our results are broadly consistent irrespective of the definition used.

We measure energy expenditure at work in a number of ways. Our first measure is an individual's sector of work. We use the two-digit National Classification of Occupation (NCO) codes to identify the type of occupation associated with the primary activity; this is defined as one in which an individual spent maximum time in the preceding year. Following the approach adopted by Fletcher and Sindelar (2009), we classify these occupations into white and blue-collar jobs. 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). Table A1 presents details on the classification of occupations.

We use the occupation code associated with the primary activity of the individual to obtain a second classification of work: low, medium, or high activity. Under this rubric (which follows Colchero, et al. (2008)), 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.

To measure intensity or physical strenuousness of work, we follow Tudor-Locke, et al. (2011) and assign each occupation a corresponding metabolic equivalent (MET) value. The MET of an activity is the ratio of the rate of energy expenditure during the activity to the rate of energy

[6] We condition on the number of days in *Definition 1*. 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.

expenditure at rest (one MET is the energy it takes to sit quietly or be at rest). Hence for example, an individual engaged in an activity with a MET value of 4 expends 4 times the energy used by a body at rest. Occupations listed in India's NCO codes at the three-digit level were matched with 509 detailed occupations in the 2002 Census Occupational Classification System (OCS) so that each NCO code could be assigned a specific MET value. We then take the average of these MET values at the three-digit occupation codes to obtain MET values at the two-digit level. This is done because the IHDS data identifies occupations only at the two-digit level. Table A2 in the Appendix presents details on the MET values assigned to each occupation under this method.[7] Finally, 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).[8]

To ensure that the mapping between sector of work and the MET values is sensible, we demarcated each occupation in Table A2 by sector of work and activity levels, and then looked at the average of MET values by these categorizations. These are reported in Figure A1 in the Appendix. Panel A of this figure show that that the average MET for white-collar occupations is 1.87 as compared to 3.23 for blue-collar occupations. Panel B of Figure A1 shows that the average METs for those in medium and high activity occupations are 2.78 and 3.42 respectively, both of which are higher than the average MET of 1.87 for those in low activity occupations.

The primary focus of our analysis is working men and women 18–60 years old residing in urban areas of India. For the majority of our analysis, 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

[7] As an alternative, we construct a weighted average of MET values where the weights are given by the number of employees in the sample in each two-digit occupation code. Please see Section 5.4 for more details.

[8] Results using these measures are presented in the Appendix. Please see Tables A4 and A5 for more details.

could be driven by ability for example, as more able people tend to be better educated and are thus more suited to remunerative occupations in the labor market. Comparing individuals within the working sample however is less susceptible to this problem. Moreover, it is not clear what metabolic equivalent values should be assigned to those who are not engaged in the labor market (no equivalent metabolic scales have been constructed for those who are not formally employed). Rather than combine disparate populations and use arbitrarily assigned metabolic equivalent values for those absent from the labor market, we restrict our main analysis to those who work. We justify this decision in three ways. First, in order to ensure that the sample of working individuals is not selected in terms of BMI (in case, for example, heavy people choose not to work and exit the labor market), we ensure that BMI in the first round does not predict exit from the working sample in the second round using the panel aspect of the IHDS data. We are able to conduct this test only for urban working women since, as noted above, the panel component of the anthropometric data is unavailable for men. These results are presented in Table A3 in the Appendix and show that BMI in the first round is not associated with withdrawal from the labor market in the second round.

Second, we present the cumulative density functions (CDF) for the BMI distributions for the working and the non-working population. The idea here is to examine whether by focusing on only the working population, we inadvertently restrict our analysis to a specific, non-representative part of the overall BMI distribution. These CDF plots are reported in Figure A2 in the Appendix where the left panel is for working women and the right panel is for working men. For women, there is little evidence that the distributions are statistically distinct, (K-S test p-value = 0.12). This is broadly the case for men also. Hence, by restricting our analysis to the working sample only, we are not curtailing the support of the overall BMI distributions. Third, 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 from 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; please see Section 5.2. We do, however, recognize that our results may not be universally applicable given our focus on the working population.

3. Empirical Framework

We estimate regressions of the following form:

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

BMI_{it} is the BMI of working individual i at time t, and $Labor\ Market\ Activity_{it}$ is the market engagement status of an individual which is defined in a number of different ways. Specification 1 defines labor market activity as the sector of work: employed in a blue-collar occupation relative to a white-collar occupation. Specification 2 uses continuous MET values associated with each occupation. We present results corresponding to other specifications of labor market activity in the Appendix. These include results from categorizing sector of occupation into low, medium, and high activity, and results from classifying intensity of occupation (based on MET values) into light, moderate, and vigorous. X_{it} includes a set of individual and household level demographic (age, square of age, marital status, years of education, religion, caste, number of children), socio-economic (household wealth), and lifestyle (smoking, hours spent watching television, ownership of a car or a motorcycle, whether the household employs domestic help, share of total food expenditure spent on eating outside the home) variables. We include a dummy for 2011–12 (IHDS2 survey) to take into account temporal variations in the pooled cross-sectional regressions for women, and a set of state dummies to account for any unobserved state specific characteristics (including government policy) that could potentially affect BMI in the regressions for women and men.[9] The regressions for working women are run on the sample that does not report being pregnant, and working men and women are restricted to be in the prime working age of 18–60 years. We report robust standard errors that are clustered at the state level.

[9] We cannot include the 2011–12 dummy for the regressions for men as BMI data for men are only available in the IHDS2 survey.

4. Descriptive Statistics

Summary statistics on the proportion of men and women employed in different sectors and in occupations of different intensity, as well as their BMI values are presented in Tables 1 and 2, respectively. Table 1 presents proportions in each category whereas Table 2 reports sample means.

Columns 1 and 2 of Table 1 show that conditional on working and depending on the definition of work used, 36–41% of women work in white-collar occupations. 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 being employed, 64–70% of urban women are employed in light intensity occupations; the proportion declines to 5–8% for occupations of vigorous intensity.

Turning to the sample of urban working men in columns 3 and 4 of Table 1, the descriptive statistics show that 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 reporting that they do not work. Conditional on working, 37–38 % of men are employed in white-collar occupations and 41–43% are engaged in high activity work. About 70–72% are in light intensity occupations and approximately 3% are in occupations of vigorous intensity.

Column 1 of Table 2 shows that the 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). Column 3 of Table 2 shows that as with the sample of women, across both definitions of work, those men employed in white-collar occupations and those men in low activity occupations have higher BMI compared to those in blue-collar occupations (24.20 kg/m^2 vs 23.03 kg/m^2) and those in high activity occupations (24.20 kg/m^2 vs 22.81 kg/m^2), respectively. Table 2 also reports that the average BMI of women working in light intensity occupations is greater than those employed in vigorous intensity occupations (23.73 kg/m^2 vs 22.15 kg/m^2 under *Definition 1*; the difference is marginally wider under *Definition 2*). Columns 3 and 4 of this Table show that a similar pattern holds for urban working men in light intensity versus vigorous intensity occupations as well.

The kernel density estimates presented in Figure 1 show that the distribution of BMI of urban women working in white-collar occupations is statistically distinct as compared to that of urban women working in blue-collar occupations; Kolmogorov-Smirnov (K-S) test p-value = 0.00.[10] Figure 1 also shows that the mass of the distribution of BMI for working men engaged in white-collar occupations lies to the right of that for those employed in blue-collar occupations (K-S test p-value for equality of distribution is 0.00).[11]

Figure 2 presents the non-parametric Lowess plots of the association between BMI and the intensity of work (MET) for urban working adults of prime age. Lowess (or locally weighted scatter-plot smoother) plots is a non-parametric smoother that creates plots which enable us to examine the association between any two variables. An advantage of a non-parametric smoother like the Lowess is that it finds a curve of best fit without assuming that the data follows some pre-specified distribution. Importantly, Lowess plots give additional weight to observations that are near the centroid of the data and less weight to those that are more removed, and are thus less sensitive to outliers in the data. Figure 2 shows that for MET values of less than or equal to 2, an increase in the intensity of work for women is weakly associated with changes in BMI. Beyond this range however, an increase in the strenuousness of occupations is associated with a systematic and substantial decline in BMI for them. In the same manner, Figure 2 shows that for a wide range

[10] Figure A3 in the Appendix presents the distribution of BMI by activity level at work for working women and men. The distribution of BMI for urban working women in low activity occupations in the left side panel is measurably different as compared to the BMI of those in medium and high activity occupations. K-S test p-values for equality of distributions are 0.00, 0.00, and 0.01 for the low and high, low and medium, and medium and high activity occupations, respectively. Similar patterns are evident for working men in the right side panel of Figure A3. These results correspond to the case where employment is defined using *Definition* 1 (the NSS definition). Results are similar when employment is defined using *Definition* 2 (the IHDS definition).

[11] Similarly in Figure A4 in the Appendix, the mass of the distribution of BMI for working adults engaged in light intensity occupations lies to the right of that for those employed in vigorous intensity occupations.

of MET values for men, there is the expected negative association between BMI and occupational intensity. This pattern weakly changes in the case of relatively high MET values, possibly driven by the paucity of observations at these higher ranges.

Table 3 presents summary statistics of our key explanatory variables in three different samples (full sample of those working, those employed in blue-collar work, and those employed in white-collar work). This Table reports measurable differences in characteristics of these groups, both at the individual and household levels, and as corroborated by the pairwise t-tests reported in column 4. As Table 3 shows, women in white-collar occupations are older, more educated, more likely to be married, more likely to belong to the 3rd and 4th wealth quartiles, more likely to live in households that possess a car or a bike, more likely to hire domestic help, and spend more time watching television, as compared to women in blue-collar occupations. They are less likely to smoke or belong to the 1st and 2nd wealth quartiles, and are likely to have fewer children than women in blue-collar work. The patterns are similar for men.

5. Regression Results

We now turn to the regression results. The results for urban working women and men aged 18–60 are presented in Section 5.1. Section 5.2 extends our analysis to include those who are not working. Section 5.3 examines the relationship between labor market engagement and energy expenditure, and Section 5.4 presents extensions and reports results from a range of alternative specifications that examine the robustness of our key results.

5.1. Results for Urban Working Women and Men

The ordinary least squares (OLS) regression results that correspond to equation (1) are presented in Table 4 and Table 5 for urban working women and men, respectively. We present two measures in these tables (blue/white-collar and MET). We use two other measures as a robustness check and present these results in Table A4 of the Appendix. We increment the model in these tables by adding controls sequentially. The full model with all covariates is reported in column 7 of Tables

4 and 5. The corresponding models that use the alternative definition of work, *Definition* 2, are presented in Table A5 in the Appendix. The results are broadly similar.

Examining the estimates in Tables 4 and 5, irrespective of the measure used, we find that jobs involving low physical activity are positively associated with BMI. The most parsimonious specification is presented in column 1 of Panels A and B and includes only age and square of age. Adding marital status in column 2 slightly attenuates the coefficient β_1. The magnitude of the estimate continues to decrease as we include investments in human capital and wealth quartiles as measures of socioeconomic status: it falls from -1.458 in Column 2 to -0.536 in Column 4 for women (see Table 4) and from -1.185 in column 2 to -0.371 in column 4 for men (see Table 5). Across columns 5 through 7, the size of the estimate stabilizes for both women and men. The coefficient in column 7 of Table 4 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.[12]

A similar analysis is conducted using MET as a measure of physical intensity for both men and women. As above, the estimate stabilizes (column 5–7, panel B of Tables 4 and 5) once we control for education and wealth quartiles. The results presented in column 7 of panel B of Table 4 show that a one-unit increase in MET is associated with a 0.26 kg/m^2 reduction in BMI.[13]

Column 7 of Table 5 (panel A) reports that relative to those working in white-collar occupations, men working in blue-collar occupations have a 0.33 kg/m^2 lower BMI.[14] An increase in MET is associated with a systematic decline in BMI (column 7 of Table 5, panel B). However,

[12] Estimates presented in column 1 of Table A4 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, with the latter coefficient estimated precisely. The BMI of those working in medium activity occupations is larger in magnitude than those in high activity occupations; however, this difference is not statistically significant.

[13] The regressions presented in column 2 of Table A4 show that relative to those working in light intensity occupations, 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 occupations although the difference is imprecisely estimated.

[14] The results presented in column 3 of Table A4 imply that relative to those working in low activity occupations, men working in high activity occupations have a lower BMI, and the difference between medium and high activity levels is statistically significant.

consistent with the patterns presented in the Lowess plots for the correlation between BMI and intensity of occupation (Figure 2), the impact is statistically weak.[15] The corresponding OLS results for intensity using the IHDS definition of work (*Definition* 2) are presented in Table A5 in the Appendix for both women and men. As is clear, these are broadly consistent with estimates in Tables 4 and 5.[16]

The results for the control variables in Tables 4 and 5 are generally as expected. For women, wealth, hours watching television, and presence of domestic help are associated with increased BMI, while for men, being married, educated, wealthy, the presence of domestic help, and ownership of motor vehicle are positively associated with BMI. For both men and women, BMI has a non-linear correlation with age which is in keeping with previous research.

As we note in Table 3, blue and white-collar workers are statistically different in observable characteristics. In light of this, we use the nearest neighbor matching estimator method (based on the propensity score method) to check the integrity of the key OLS results presented in column 7 of Tables 4 and 5.[17] The average treatment effect for blue-collar workers (relative to white-collar workers) continues to be negative and statistically significant. In particular the estimated average treatment effect for women is -0.072 (p-value = 0.000), and for men is -0.055 (p-value = 0.000). These estimated average treatment effects are smaller in magnitude as compared to the OLS estimates, consistent with the fact that the two groups are measurably different. However our original results continue to hold in terms of the direction of the association and statistical significance.

We next estimate the association between physical activity at work and the distribution of BMI. The increase in mean BMI could either be the result of an increase in the upper tail of

[15]Relative to men working in light intensity occupations, although those in moderate intensity occupations have BMI that is 0.28 kg/m^2 lower (Column 4 of Table A4); the coefficient for those in vigorous intensity occupations is statistically zero. Further, the difference between vigorous and moderate is not precisely measured.

[16] In Table A5, only the difference between high and medium activity levels is statistically significant for women and men under *Definition 2*.

[17] Results available on request.

the BMI distribution or a decrease in the proportion of those who are undernourished in the lower tail of the BMI distribution. These have different implications. We employ quantile regression models to examine the distributional implications of labor market engagement on BMI. The regression specification is given by

$$BMI_{it} = \beta_{0\theta} + \beta_{1\theta} Labor\ Market\ Activity_{it} + \gamma_{\theta} X_{it} + \varepsilon_{it} \quad (2)$$

Equation (2) is estimated at five different values of $\theta = 0.10, 0.25, 0.50, 0.75, 0.90$, i.e., at the 10^{th}, 25^{th}, 50^{th}, 75^{th} and 90^{th} quantiles. We report in Figure 3 the coefficient estimates of $\beta_{1\theta}$ (blue-collar occupation or MET) and the bootstrapped 95% confidence intervals (from 1000 iterations). Panel A of Figure 3 shows that for women, employment in a blue-collar occupation is associated with a statistically significant reduction in BMI at the 25^{th}, 50^{th} and 75^{th} quantiles, relative to employment in a white-collar occupation. For men, the statistically significant impacts are at the 50^{th}, 75^{th} and 90^{th} quantiles. Panel B reports quantile results for the intensity of work measured by MET. These results, while slightly weaker, are qualitatively similar to those presented in Panel A of Figure 3.

The broadly negative association in Panel A of Figure 3 highlights that the increase in average BMI for working men and women originates from those who are already at high levels of BMI, that is, the BMI distribution is widening. Although the negative association in Panel B is only weakly evident, the patterns in these Panels of Figure 3 allow us to rule out that the increase in mean BMI originates primarily in the lower tail of the BMI distribution. Hence these quantile estimates allow us to unpack dynamics at different points in the BMI distribution to reveal that the main impetus for increases in BMI comes from those at the right extreme, suggesting that policies that focused on individuals in this part of the BMI distribution may yield the most benefits in terms of remedial public health measures.

5.2. Including the Non-Working

In the regression results presented in Tables 4 and 5, the sample was restricted to prime-age urban working sample. We next examine the sensitivity of our results by including the non-working sample aged 18–60. Sector of work now has three possibilities: not working, employed in a white-collar occupation, or employed in a blue-collar occupation. Similarly the activity classification now has four groupings (not working, working in a low activity occupation, working in a medium activity occupation, or working in a high activity occupation). These results are presented in Table 6. Columns 1 and 2 pertain to all urban women aged 18–60 and columns 3 and 4 to all urban men aged 18–60. We are unable to estimate the corresponding specifications to panel B of Tables 4 and 5 as MET values are undefined for those who do not work. The estimates presented in Table 6 include all the variables in column 7 of Tables 4 and 5. The results reported in column 1 resonate with those in column 7 of Table 4. In particular, those employed in blue-collar work (relative to not working) have lower BMI. In terms of activity levels, column 2 shows that women in medium and high activity occupations (relative to not working) have significantly lower BMI.

Results for men in columns 3 and 4 of Table 6 are broadly consistent with those reported in column 7 of Table 5. In particular, blue-collar work relative to not working is associated with lower BMI, as is work in high activity occupations. The differences between blue-collar and white-collar work are significant for both men and women (-0.343 and -0.326, respectively). For men, differences between high and low activity work and between high and medium activity work are both statistically significant (-0.486 and -0.438, respectively). For women, only the former difference is statistically significant (-0.455).[18]

An important thing to note is that the results for BMI of non-working women (or men) and women (or men) working in white-collar jobs are similar, while the BMI of those in blue-collar jobs is significantly lower than the BMI of those who are not engaged in the labor market. Since the non-working women/men category is akin to the category composed of those in low activity jobs, we deduce that much of the increase in BMI over time may be attributed to a decline

[18] Results using *Definition 2* are presented in Table A6 of the Appendix and are similar.

in employment in jobs that are physically more demanding (blue-collar work) rather than transitions from out-of-work status to white-collar work (or vice versa).

5.3. Labor Market Engagement and Energy Expenditure

It is possible that the positive correlation between BMI and labor market inactivity reflects variations in the energy density of diets. In particular, white-collar workers may consume a diet that is energy dense while blue-collar workers may not. In order to shed further light on the dynamics of energy intake and energy expenditure, we use information on three diet-related variables from the IHDS. Table 7 presents these results. Models in this table sequentially include per capita food expenditure of households (column 1), share of expenditure on high energy dense foods which is the aggregate of the share of expenditure on sugar, sweeteners, processed food and share of expenditure on eating out (column 2), and the share of expenditure on low energy dense food which is the share of expenditure on fruits and vegetables (column 3).[19] As the results in columns 1–3 of this table make clear, the coefficient on the blue-collar occupation dummy remains essentially unaltered.

The regressions presented in Tables 4 and 5 include controls for activity at home (such as doing household chores) and reduced activity that may result from use of vehicles. As we mention above, presence of domestic help proxies for the eased burden of domestic chores, and ownership of a motor vehicle (car or bike) proxies for less physically strenuous modes of travel. IHDS2 also collects information on time taken (in minutes) to travel to work. We include travel time as an additional control in column 4 of panels A and B of Table 7. This data was collected only in IHDS2 however, so the sample in column 4 is restricted to urban working adults aged 18–60 in IHDS2. Results show that including this additional control increases the magnitude of the blue-collar dummy coefficient for women which continues to remain statistically significant. However, we lose statistical precision on the blue-collar dummy for men.

[19] Food expenditure is deflated using the consumer food price index with 2001 as the base year.

As discussed above, any change in BMI could be the result of changes in energy expenditure (measured by labor market engagement), or changes in energy (caloric) intake, or both. If labor market activity decreases BMI at the same time as it decreases caloric intake, this suggests that the overall effect on BMI originates from two separate sources. In this case, it is hard to pin-point the dominating force. Alternatively, if labor market activity has no effect on or increases caloric intake, we have a better case for concluding that the aggregate impact on BMI originates primarily from a relative increase in energy expenditure. To investigate this further, we regress labor market activity (blue-collar work status) on variables that capture caloric intake that were described above. These results are presented in Table 8. The results in columns 1 and 2 are for urban working age women in IHDS1 and IHDS2, while those in columns 3 and 4 are for urban working age men in IHDS2. For women, the association between labor market activity and caloric intake is mostly insignificant with just one instance of a positive association in the case of high energy dense foods. This suggests that for women, much of the overall BMI effect originates from the relative increase in energy expenditure for women in blue-collar work relative to those in white-collar work. For men however, work in a blue collar occupation is associated with a decline in per capita food expenditure and share of expenditure on high energy dense foods. MET for working men is also associated with a decline in expenditures on high energy dense foods. This is possibly an income effect as average earnings are lower in blue-collar occupations. Hence for men, the aggregate BMI impact appears to originate from both a decline in calories and a relative increase in energy expenditure as captured by both blue-collar work status and MET values.[20]

5.4. Robustness Checks and Extensions

The MET values in Tables 4 and 5 were constructed by taking the (simple) average of MET values of corresponding three-digit codes to arrive at the two-digit level. This was necessary as the IHDS

[20] Note that these expenditure variables are at the household level as the IHDS does not collect individual level data on these measures. These results should thus be interpreted keeping that in mind.

data identifies occupations at the more composite two-digit level. However, this method may not accurately reflect the fact that certain occupations are relatively more common than others in India. In order to take this into account, we construct a weighted MET value where the weights are given by the relative proportion of employees in the sample in each two-digit occupation code. It is to be expected that given the exertive nature of labor required, on average, vigorous intensity work will engage relatively few urban women and men. On the other hand, working women in particular are more likely to be in light intensity jobs. This is borne out in our data as seen in Table 1 where the relative proportion of urban women in light intensity jobs using *Definition 1* is 69.8%. The corresponding relative proportion in vigorous intensity activities is substantially lower at 5.3%. This is also true for urban men under *Definition 1* where 71.7% are in light intensity work versus 2.5% in vigorous intensity jobs. We also know that average MET values are relatively high in jobs of greater intensity levels and commensurately low in light work. Indeed, we define intensity levels based on MET values in Table 1 as discussed above. Hence when we move away from weighting occupations equally, the higher MET values will get relatively small weights reflecting the smaller numbers employed there, whereas the lower MET values will get relatively high weights reflecting the larger numbers employed in that category. This means that on average, the newly weighted MET values (that reflect the fact that some occupations are more common than others) will be lower on average than the previous MET values that gave equal weight to each occupational category. Results in Table 6 that point to a decline in blue-collar jobs as an important factor contributing to the rise in BMI also confirms that this manner of re-weighting will result in lower MET values on average. Hence we should expect that weighting of this nature will yield estimates that are smaller than those that result from the case where occupations are given equal importance.

The regression results that use weighted MET where weights are the relative proportion of workers in each occupation are presented in Table 9: column 1 for women and column 2 for men. While the magnitude of the coefficient estimate is lower as expected, our main MET results in Tables 4 and 5 continue to hold. The coefficient estimate is negative and statistically significant for women indicating that employment in a higher intensity occupation is associated with declines in BMI. The coefficient has the expected sign but is insignificant for men, as it was in the last column of Table 5.

As an additional check to account for the skewed nature of the BMI data, we re-estimate our basic regressions after transforming BMI into its log counterpart. These results are reported in Table 10 and are similar to those presented in Tables 4 and 5.[21]

Finally, we use the panel aspect of the data to run fixed-effects models for working women in the age group of interest. This is done in order to account for time invariant unobservables that may influence results. The estimates from this model are presented in Panel A of Table 11. We find that change in job type (from blue-collar to white-collar occupation) is not associated with a significant change in BMI (column 1). The results are similar when we use MET (column 2). This may be because there is considerable persistence in the sector of occupation and in MET values across the two rounds of the survey which are relatively closely spaced, which implies that the magnitude of variation in the data to identify these impacts is small. Furthermore, we examine whether sector of occupation in IHDS1 (as the baseline) is associated with a change in BMI over the two rounds of the survey. In particular, we regress change in BMI ($BMI_{t+1} - BMI_t$) across the two rounds of the panel data for urban working women on the type of job and other covariates in time t (that is, in IHDS1). These regression results are reported in Panel B of Table 11.[22] Neither the type of job in IHDS1 nor the intensity of work in IHDS1 has any effect on the change in BMI across rounds. As noted above, one reason may be that the rounds are relatively closely spaced. Another explanation may be provided by Figure A5 in the Appendix. This figure shows that the distribution of change in BMI over the two rounds has a

[21] We also estimate the year specific effects for women in IHDS2 alone and note that while there are a few minor differences as compared to the estimates from the pooled cross-section sample, the effects of sector and intensity of work are similar in the pooled cross-sections and IHDS2 alone samples. These results are available on request.
[22] The model includes those who could be tracked in both rounds. Restricting the sample to those who could be tracked and work in both rounds does not change results.

mass around 0 indicating that there is considerable persistence in BMI over time. We find this to be the case for women employed in both blue-collar and white-collar work in IHDS1.

6. Conclusion and Policy Implications

Excess weight, generally considered a problem of richer countries, is now 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 this increase. Using data on labor market engagement and its intensity, this study shows that physical activity at work is associated with higher BMI and probability of being overweight or obese across a wide range of specifications. While we acknowledge that several limitations remain due to lack of availability of data (on exercise activity including leisure/sport activities and individual level data on food intake) which also constrains our ability to draw causal implications, this study finds consistent evidence that lower occupational activity levels are associated with higher levels of BMI.

Decreasing employment in agriculture and a general trend towards a service sector economy imply lower activity levels at work, a process that is occurring at a rapid pace in many developing countries (Monda, et al. (2007)). Technological innovations have also served to make domestic activities and the work place less strenuous (Lakdawalla, et al. (2005)). From a health perspective, understanding the correlation between BMI and physical activity levels is thus of considerable importance. Our research contributes to the literature by analyzing the correlation between BMI and strenuousness of work in the context of a large developing country. In addition to the positive association between BMI and low physical effort at work, our study suggests that there is value in considering these dynamics at different points in the BMI distribution. In particular, we find that the main impetus for increase in mean BMI comes from those at the upper tail of the BMI distribution. Hence, examining the entire distribution and targeting individuals in the right tail of the distribution may help in crafting more efficient public health policies. While we cannot provide a causal interpretation of our results due to data constraints, the results presented in this paper suggest that the increase in BMI that we observe in India is possibly driven by structural transformation that has led to declines in employment in the blue-collar sector.

Given these findings, procedures designed to tackle behavioral risk factors linked with high BMI levels such as physical inactivity and diet are indispensable. Examples include communication programs that disseminate information on the gravity of the issue, and that serve to spread awareness on the benefits of physical exertion in daily routines. Other examples include actions that facilitate the ease of walking to work or those that encourage the use of public transportation. Encouraging physical activity through employer-sponsored subsidies for gym membership may also be effective, although there is some evidence that membership alone may be insufficient to bring about meaningful improvements in BMI levels (Della Vigna and Malmendier (2006)). Community wide campaigns may also 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 absence of safe and secure environments may deter women in particular from being more physically engaged (UN (2007)). Rectifying this would be an important step in the right direction. These are a few examples of interventions which may mitigate the unintended health consequences of a torpid workplace.

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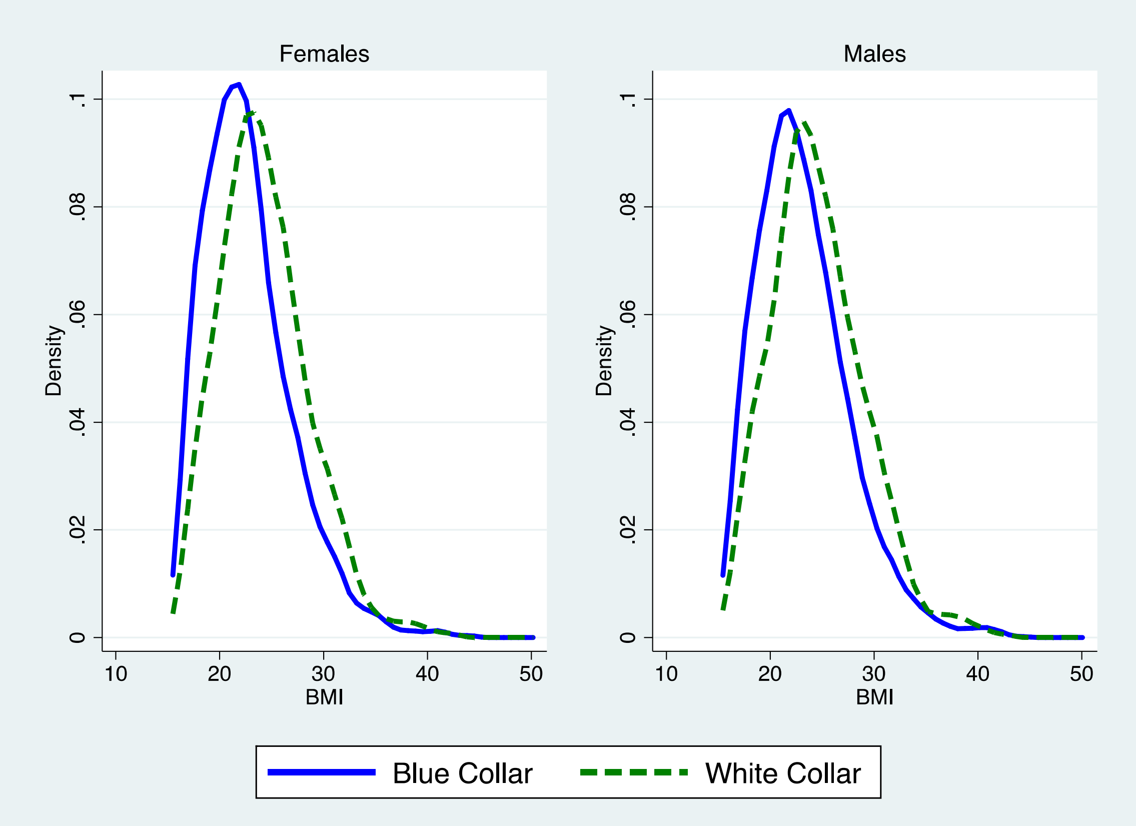
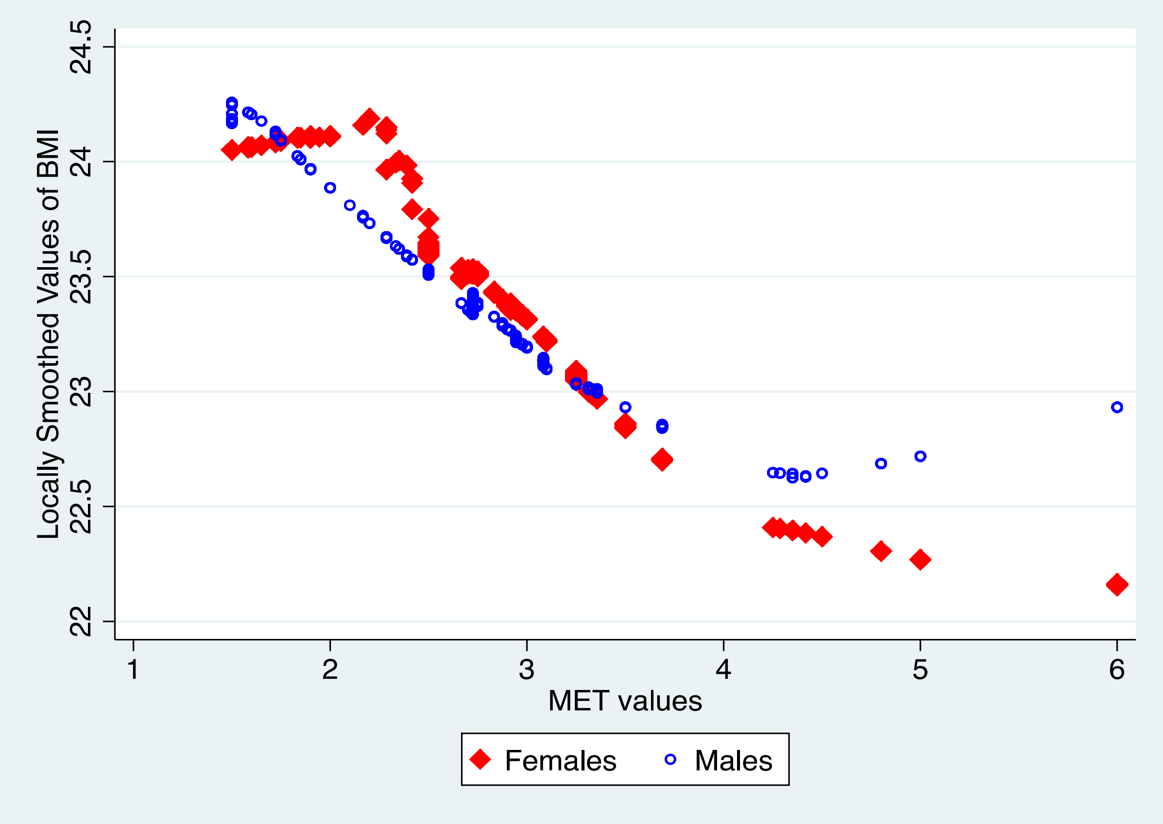
Figure 1: Distribution of BMI by Sector of Occupation



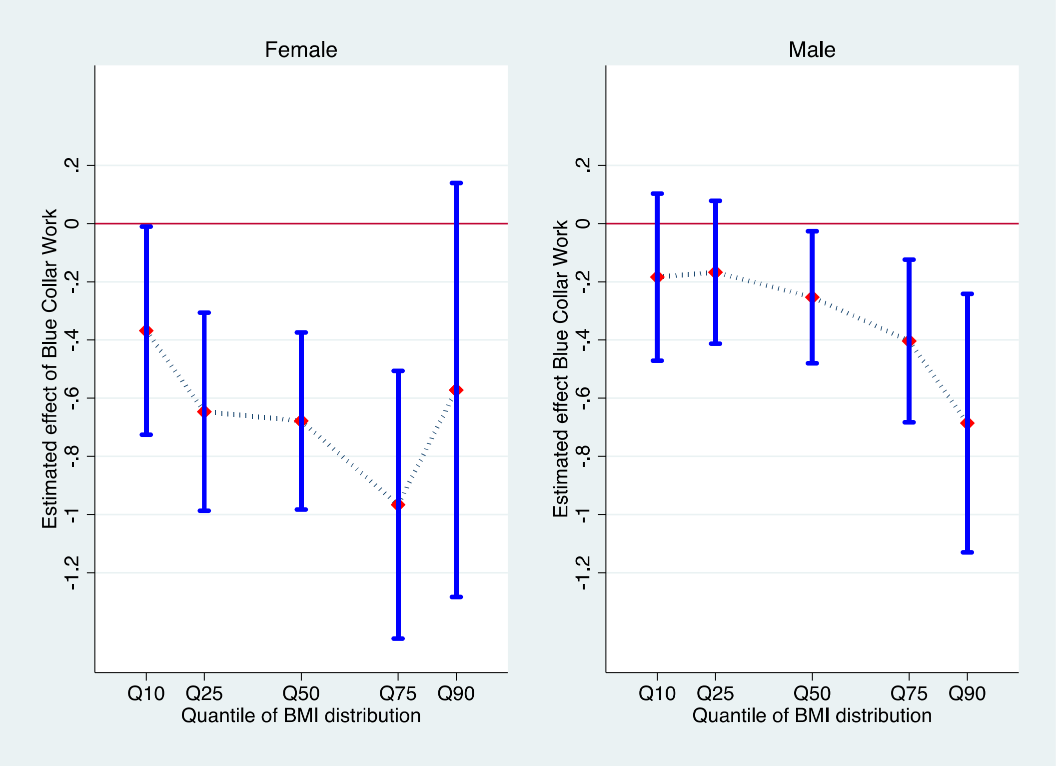
Notes: Kernel Density Estimates of BMI presented. Sample for women restricted to urban working women aged 18–60 in IHDS1 and IHDS2. Sample for men is restricted to urban working men aged 18–60 in IHDS2. See Table A1 for categorization of occupations. Kolmogorov-Smirnov (K-S) test p-value for equality of distribution is 0.00, for both women and men. Employment defined using *Definition* 1.

Figure 2: Lowess Plots of BMI and MET

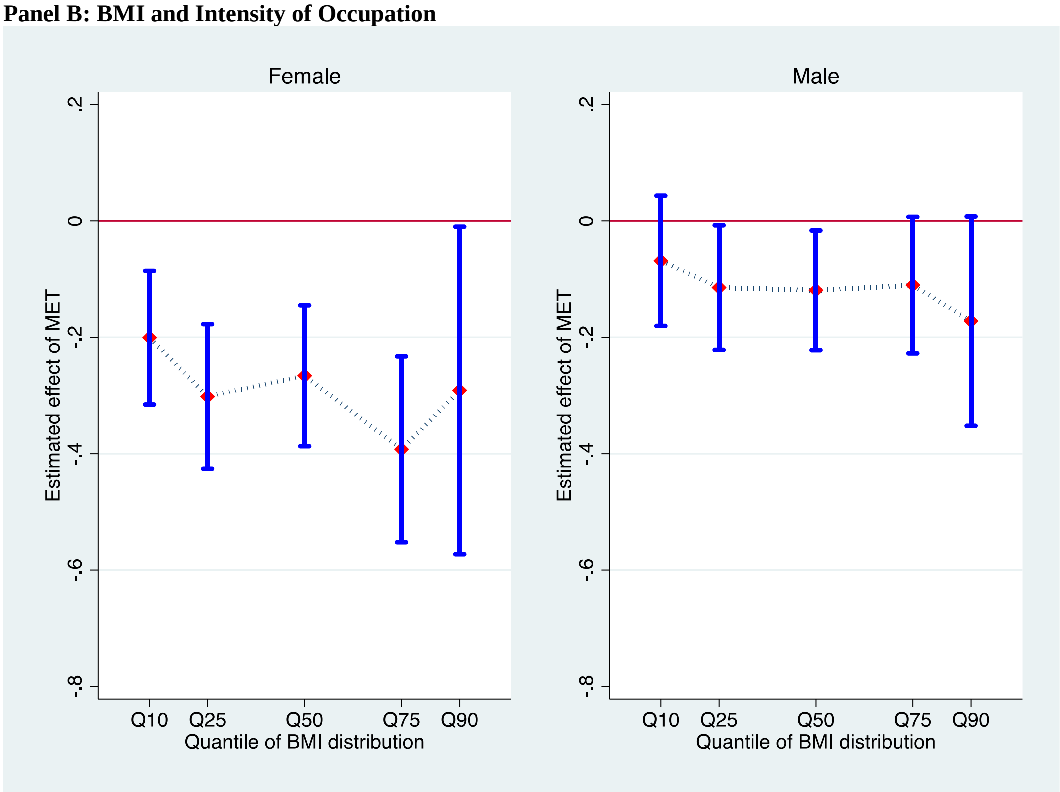


Notes: Lowess regression results. Sample for women restricted to urban working women aged 18–60 in IHDS1 and IHDS2. Sample for men is restricted to urban working men aged 18–60 in IHDS2. See Table A2 for the MET values associated with each occupation. Employment defined using *Definition* 1.

Figure 3: Quantile Regression Results
Panel A: BMI and Sector of Occupation



Panel B: BMI and Intensity of Occupation



Notes: Coefficient estimates and bootstrapped 95% confidence intervals (1000 iterations) from Quantile Regressions (equation (2)) presented. The sample for women includes 18–60 year-old working urban women at the time of survey in IHDS1 and IHDS2. The sample for men includes 18–60 year-old working urban men in IHDS2. 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 religion, the share of total expenditure on eating outside) controls, and a set of state dummies. The regressions for women also include an IHDS2 year dummy.

Table 1: Descriptive Statistics of Urban Women and Men by Work Status, Occupational Groups and Intensity of Work

	Women Aged 18–60		Men Aged 18–60	
	Definition 1	***Definition 2***	***Definition 1***	***Definition 2***
	(1)	(2)	(3)	(4)
Working Status				
Working	17.30	21.01	72.04	76.85
Non-working	82.70	78.99	27.96	23.15
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
Intensity of Activity: MET				
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

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. Proportion of women and men in each category presented. See Table A1 for categorization of occupations. See Table A2 for the MET values associated with each occupation.

Table 2: BMI of Urban Women and Men by Work Status, Occupational Groups and Intensity of Work

	Women Aged 18–60		**Men Aged 18–60**	
	Definition 1	***Definition 2***	***Definition 1***	***Definition 2***
	(1)	(2)	(3)	(4)
Sector of Occupation				
Not Working	23.60	23.65	22.72	22.76
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				
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. Average BMI of women and men in each category presented. See Table A1 for categorization of occupations. See Table A2 for the MET values associated with each occupation.

Table 3: Characteristics by Sector of Work

	All		Blue-collar		White-collar		Difference
	Mean	SE	Mean	SE	Mean	SE	
	(1)		(2)		(3)		(2 - 3)
Panel A: Urban Working Women Aged 18─60 (Pooled)							
Age	35.934	0.062	37.465	0.178	38.271	0.202	-0.806***
Year of Schooling	7.233	0.031	3.993	0.086	10.500	0.117	-6.507***
Married	0.870	0.002	0.759	0.008	0.798	0.009	-0.039***
Smoke Tobacco	0.035	0.001	0.068	0.005	0.029	0.004	0.039***
Hours watching TV	2.559	0.009	2.296	0.031	2.477	0.031	-0.181***
Number of Children	1.903	0.008	2.057	0.028	1.724	0.028	0.333***
Wealth Quartile 1	0.214	0.003	0.467	0.010	0.110	0.007	0.357***
Wealth Quartile 2	0.247	0.003	0.291	0.009	0.181	0.009	0.110***
Wealth Quartile 3	0.256	0.003	0.164	0.008	0.260	0.010	-0.096***
Wealth Quartile 4	0.284	0.003	0.078	0.005	0.450	0.012	-0.371***
Household hires domestic help	0.077	0.002	0.025	0.003	0.146	0.008	-0.120***
Household possesses car or bike	0.425	0.003	0.197	0.008	0.542	0.012	-0.344***
Hindu Household	0.772	0.003	0.802	0.008	0.790	0.009	0.012***
Muslim Household	0.162	0.002	0.143	0.007	0.091	0.007	0.053***
Other Religion Household	0.065	0.002	0.055	0.005	0.120	0.007	-0.065***
Share of Expenditure eating out (percent)	2.756	0.032	2.318	0.097	3.476	0.143	-1.158***
Panel B: Urban Working Men Aged 18─60 (IHDS 2)							
Age	37.825	0.137	39.222	0.182	40.900	0.225	-1.678***
Year of Schooling	9.334	0.050	7.403	0.071	11.319	0.085	-3.916***
Married	0.727	0.005	0.838	0.006	0.839	0.008	0.000
Smoke Tobacco	0.271	0.005	0.363	0.008	0.235	0.009	0.127***
Hours watching TV	1.900	0.013	1.854	0.019	1.898	0.022	-0.044*
Number of Children	1.403	0.015	1.700	0.023	1.499	0.025	0.201***
Wealth Quartile 1	0.215	0.005	0.307	0.008	0.102	0.006	0.205***
Wealth Quartile 2	0.251	0.005	0.293	0.008	0.194	0.008	0.099***
Wealth Quartile 3	0.256	0.005	0.248	0.007	0.269	0.009	-0.021*
Wealth Quartile 4	0.278	0.005	0.152	0.006	0.435	0.010	-0.283***
Household hires domestic help	0.060	0.003	0.034	0.003	0.094	0.006	-0.060***
Household possesses car or bike	0.500	0.005	0.381	0.008	0.649	0.010	-0.268***
Hindu Household	0.786	0.004	0.787	0.007	0.802	0.008	-0.016
Muslim Household	0.148	0.004	0.154	0.006	0.129	0.007	0.026***
Other Religion Household	0.066	0.003	0.059	0.004	0.069	0.005	-0.010
Share of Expenditure eating out (percent)	3.025	0.065	2.702	0.097	3.613	0.127	-0.911***

Notes: NSS definition (*Definition* 1) of employment used. 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. See Table A1 for categorization of occupations.

Table 4: Regression of BMI on Sector and Intensity of Work for Urban Working Women

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Sector of Work							
Blue-collar[a]	-1.472***	-1.458***	-0.825***	-0.536**	-0.474**	-0.466**	-0.439**
	(0.174)	(0.174)	(0.193)	(0.222)	(0.201)	(0.199)	(0.193)
Age	0.318***	0.296***	0.313***	0.276***	0.299***	0.296***	0.338***
	(0.054)	(0.053)	(0.054)	(0.049)	(0.046)	(0.044)	(0.052)
Age square	-0.003***	-0.003***	-0.003***	-0.002***	-0.003***	-0.003***	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Married[b]		0.379***	0.373***	0.142	0.198	0.157	0.115
		(0.131)	(0.132)	(0.134)	(0.159)	(0.156)	(0.161)
Years of education			0.099***	0.029*	0.029*	0.018	0.023
			(0.012)	(0.015)	(0.017)	(0.018)	(0.016)
Wealth Q2[c]				0.578***	0.578***	0.530***	0.630***
				(0.203)	(0.183)	(0.178)	(0.161)
Wealth Q3[c]				1.290***	1.234***	1.123***	1.091***
				(0.223)	(0.237)	(0.236)	(0.222)
Wealth Q4[c]				1.952***	1.913***	1.610***	1.810***
				(0.365)	(0.405)	(0.397)	(0.314)
Tobacco[d]					0.167	0.155	0.101
					(0.408)	(0.405)	(0.401)
Hours TV					0.049	0.047	0.060*
					(0.033)	(0.034)	(0.034)
No of Children					-0.084	-0.075	-0.110
					(0.059)	(0.057)	(0.073)
Domestic Help[e]						0.997**	0.914**
						(0.410)	(0.422)
Own Car or bike[f]						0.247	0.261
						(0.165)	(0.165)
Muslim[g]							0.319
							(0.250)
Other Religion[g]							-0.060
							(0.248)
Share eat out							-0.041***
							(0.013)
Year (2011–12)[h]	0.807***	0.838***	0.691***	0.859***	0.726***	0.723***	0.697***
	(0.194)	(0.190)	(0.209)	(0.211)	(0.214)	(0.229)	(0.229)
Constant	15.954***	16.035***	14.549***	14.977***	14.532***	14.657***	13.926***
	(1.121)	(1.094)	(1.098)	(0.980)	(0.900)	(0.879)	(0.982)
Sample Size	4,473	4,473	4,471	4,176	3,928	3,913	3,743
Panel B: Physical Intensity of Work (MET)							
MET	-0.546***	-0.539***	-0.332***	-0.248***	-0.237***	-0.247***	-0.261***
	(0.088)	(0.088)	(0.083)	(0.088)	(0.075)	(0.074)	(0.060)
Age	0.336***	0.314***	0.328***	0.287***	0.309***	0.306***	0.346***
	(0.054)	(0.052)	(0.053)	(0.047)	(0.044)	(0.042)	(0.053)
Age square	-0.003***	-0.003***	-0.003***	-0.002***	-0.003***	-0.003***	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Married[b]		0.363***	0.356**	0.120	0.177	0.132	0.091
		(0.130)	(0.131)	(0.133)	(0.159)	(0.155)	(0.158)
Years of education			0.110***	0.034***	0.032**	0.020	0.022

			(0.010)	(0.012)	(0.015)	(0.017)	(0.014)
Wealth Q2[c]				0.512**	0.514***	0.459**	0.546***
				(0.203)	(0.184)	(0.178)	(0.165)
Wealth Q3[c]				1.228***	1.169***	1.045***	0.993***
				(0.228)	(0.235)	(0.232)	(0.220)
Wealth Q4[c]				1.950***	1.900***	1.571***	1.748***
				(0.380)	(0.414)	(0.410)	(0.331)
Tobacco[d]					0.138	0.124	0.074
					(0.416)	(0.413)	(0.407)
Hours TV					0.042	0.040	0.054
					(0.034)	(0.035)	(0.035)
No of Children					-0.084	-0.075	-0.105
					(0.061)	(0.059)	(0.074)
Domestic Help[e]						1.041**	0.964**
						(0.396)	(0.409)
Own Car or bike[f]						0.260	0.273
						(0.166)	(0.165)
Muslim[g]							0.250
							(0.232)
Other Religion[g]							-0.036
							(0.239)
Share eat out							-0.041***
							(0.013)
Year (2011–12)[h]	0.728***	0.759***	0.632***	0.824***	0.700***	0.698***	0.678***
	(0.201)	(0.197)	(0.212)	(0.208)	(0.208)	(0.224)	(0.223)
Constant	16.330***	16.400***	14.675***	15.176***	14.790***	14.969***	14.357***
	(1.178)	(1.142)	(1.100)	(0.998)	(0.912)	(0.897)	(1.018)
Sample Size	4,473	4,473	4,471	4,176	3,928	3,913	3,743

Notes: Dependent variable in the regressions is BMI. OLS regressions presented. Sample restricted to urban working women aged 18–60 at the time of survey in IHDS1 and IHDS2. Employment measured using the NSS definition of work (*Definition* 1). Standard errors clustered at the state level in parenthesis. Significance: * p<0.10, ** p<0.05, *** p<0.01.

Reference Categories. [a]: white-collar; [b]: unmarried or separated or divorced for married; [c]: quintile 1 for wealth; [d]: not consume tobacco; [e]: do not employ domestic help; [f]: do not own car or bike; [g]: Hindu; [h]: Year 2004–05 (IHDS1).

Table 5: Regression of BMI on Sector and Intensity of Work for Urban Working Men

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Panel A: Sector of Work							
Blue-collar[a]	-1.166***	-1.185***	-0.588***	-0.371***	-0.365***	-0.332***	-0.334***
	(0.114)	(0.114)	(0.101)	(0.095)	(0.091)	(0.099)	(0.117)
Age	0.333***	0.269***	0.252***	0.252***	0.280***	0.281***	0.273***
	(0.026)	(0.029)	(0.033)	(0.030)	(0.028)	(0.028)	(0.034)
Age square	-0.004***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married[b]		0.555***	0.689***	0.626***	0.751***	0.720***	0.680***
		(0.173)	(0.170)	(0.176)	(0.207)	(0.214)	(0.229)
Years of education			0.153***	0.087***	0.076***	0.059***	0.062***
			(0.018)	(0.011)	(0.011)	(0.010)	(0.016)
Wealth Q2[c]				0.958***	0.854***	0.737***	0.657***
				(0.101)	(0.103)	(0.094)	(0.107)
Wealth Q3[c]				1.506***	1.343***	1.043***	0.943***
				(0.172)	(0.169)	(0.186)	(0.194)
Wealth Q4[c]				1.959***	1.758***	1.208***	1.135***
				(0.310)	(0.294)	(0.308)	(0.316)
Tobacco[d]					-0.534***	-0.497***	-0.486***
					(0.114)	(0.107)	(0.110)
Hours TV					0.013	0.011	0.015
					(0.080)	(0.083)	(0.072)
No of Children					-0.064	-0.043	-0.043
					(0.047)	(0.044)	(0.044)
Domestic Help[e]						1.129***	1.094***
						(0.314)	(0.355)
Own Car or bike[f]						0.747***	0.794***
						(0.207)	(0.209)
Muslim[g]							0.236
							(0.288)
Other Religion[g]							0.147
							(0.208)
Share eat out							-0.002
							(0.012)
Constant	17.019***	17.930***	16.278***	15.792***	15.564***	15.533***	15.647***
	(0.528)	(0.548)	(0.598)	(0.565)	(0.555)	(0.538)	(0.761)
Sample Size	5,996	5,996	5,991	5,902	5,653	5,620	5,165
Panel B: Physical Intensity of Work (MET)							
MET	-0.499***	-0.505***	-0.273***	-0.139**	-0.129*	-0.122*	-0.116
	(0.075)	(0.074)	(0.064)	(0.062)	(0.067)	(0.064)	(0.072)
Age	0.331***	0.271***	0.253***	0.252***	0.280***	0.281***	0.273***
	(0.026)	(0.028)	(0.032)	(0.030)	(0.028)	(0.028)	(0.034)
Age square	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married[b]		0.522***	0.680***	0.619***	0.746***	0.715***	0.675***
		(0.172)	(0.168)	(0.175)	(0.204)	(0.212)	(0.228)
Years of education			0.155***	0.092***	0.081***	0.063***	0.066***
			(0.017)	(0.011)	(0.011)	(0.010)	(0.015)
Wealth Q2[c]				0.926***	0.826***	0.708***	0.632***
				(0.097)	(0.100)	(0.090)	(0.100)

Wealth Q3[c]				1.469***	1.314***	1.010***	0.918***
				(0.173)	(0.171)	(0.189)	(0.192)
Wealth Q4[c]				1.952***	1.758***	1.199***	1.135***
				(0.302)	(0.286)	(0.305)	(0.307)
Tobacco[d]					-0.528***	-0.490***	-0.481***
					(0.115)	(0.108)	(0.111)
Hours TV					0.009	0.008	0.013
					(0.081)	(0.084)	(0.073)
No of Children					-0.067	-0.045	-0.045
					(0.047)	(0.044)	(0.045)
Domestic Help[e]						1.135***	1.100***
						(0.310)	(0.352)
Own Car or bike[f]						0.755***	0.804***
						(0.207)	(0.209)
Muslim[f]							0.232
							(0.289)
Other Religion							0.166
							(0.210)
Share eat out							-0.002
							(0.012)
Constant	17.607***	18.469***	16.598***	15.892***	15.639***	15.616***	15.706***
	(0.633)	(0.636)	(0.712)	(0.678)	(0.645)	(0.615)	(0.829)
Sample Size	5,996	5,996	5,991	5,902	5,653	5,620	5,165

Notes: Dependent variable in the regressions is BMI. OLS regressions presented. Sample restricted to urban working men aged 18–60 at the time of survey in IHDS2. Employment measured using the NSS definition of work (*Definition* 1). Standard errors clustered at the state level in parenthesis. Significance: * p<0.10, ** p<0.05, *** p<0.01.

Reference Categories. [a]: white-collar; [b]: unmarried or separated or divorced for married; [c]: quintile 1 for wealth; [d]: not consume tobacco; [e]: do not employ domestic help; [f]: do not own car or bike; [g]: Hindu.

Table 6: Regression of BMI on Sector and Intensity of Work. Full Sample

	All Urban Women Aged 18–60		***All Urban Men Aged 18–60***	
	(1)	(2)	(3)	(4)
White-collar[a]	-0.222		0.098	
	(0.182)		(0.190)	
Blue-collar[a]	-0.565***		-0.228**	
	(0.115)		(0.105)	
Low Activity[b]		-0.222		0.101
		(0.182)		(0.190)
Medium Activity[b]		-0.396*		0.052
		(0.223)		(0.139)
High Activity[b]		-0.677***		-0.385***
		(0.137)		(0.120)
Sample Size	22,584	22,584	7,193	7,193

Notes: Dependent variable in regressions is BMI. OLS regression results presented. Employment measured using the NSS definition of work (*Definition* 1). In columns 1 and 2, sample restricted to 18–60 year-old urban women at the time of survey in IHDS1 and IHDS2. In columns 3 and 4, sample restricted to 18–60 year-old urban men in IHDS2. 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 religion, the share of total expenditure on eating outside) controls, and a set of state dummies. The regressions in columns 1 and 2 also include an IHDS2 year dummy. Standard errors clustered at the state level are parenthesis. Significance: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.
Reference categories. [a]: not-working; [b]: not working for low, medium and high activity.

Table 7: Regression of BMI on Sector and Intensity of Work. Accounting for Energy Expenditure

	(1)	(2)	(3)	(4)
Panel A: Urban Working Women Aged 18–60				
Blue-collar[a]	-0.456**	-0.437**	-0.451**	-0.731**
	(0.187)	(0.193)	(0.185)	(0.305)
MET	-0.262***	-0.262***	-0.260***	-0.317**
	(0.061)	(0.059)	(0.060)	(0.122)
Panel B: Urban Working Men Aged 18–60				
Blue-collar[a]	-0.324***	-0.335***	-0.333***	-0.091
	(0.115)	(0.117)	(0.115)	(0.172)
MET	-0.117	-0.117	-0.116	-0.021
	(0.073)	(0.072)	(0.072)	(0.089)
Share of expenditure on eating out	No	No	No	Yes
Per capita food Expenditure	Yes	No	No	No
Share of expenditure on high energy dense food	No	Yes	No	No
Share of expenditure on low energy dense food	No	No	Yes	No
Travel time	No	No	No	Yes

Notes: Dependent variable in the regressions is BMI. OLS regressions presented. Base categories: white-collar for blue-collar. Each cell presents the results from a different regression. Sample in columns 1–3 in Panel A, restricted to urban working women aged 18–60 at the time of survey in IHDS1 and IHDS2. Sample in columns 1–3 in Panel A and in column 4, both Panels, restricted to urban working men aged 18–60 at the time of survey in IHDS2. Results using sector of employment (blue versus white-collar) presented. Employment measured using the NSS definition of work (*Definition* 1). The regressions also 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 religion, the share of total expenditure on eating outside) controls, and a set of state dummies. The regressions in columns 1–3 in Panel A also include an IHDS2 year dummy. Standard errors clustered at the state level in parenthesis. Significance: * p<0.10, ** p<0.05, *** p<0.01.

Reference Category. [a]: white-collar

Table 8: Labor Market Engagement and Diet

	Urban Working Women Aged 18–60		*Urban Working Men Aged 18–60*	
	(1)	(2)	(3)	(4)
Panel A: Per capita food Expenditure				
Blue Collar[a]	-22.858		-94.984***	
	(32.457)		(31.080)	
MET		1.053		14.967
		(11.857)		(16.349)
Sample Size	3,742	3,742	5,166	5,166
Panel B: Share of expenditure on high energy dense food				
Blue Collar[a]	0.429*		-0.493**	
	(0.214)		(0.203)	
MET		0.024		-0.201***
		(0.098)		(0.064)
Sample Size	3,742	3,742	5,166	5,166
Panel C: Share of expenditure on low energy dense food				
Blue Collar[a]	-0.002		0.001	
	(0.003)		(0.003)	
MET		-0.002		0.000
		(0.001)		(0.002)
Sample Size	3,742	3,742	5,166	5,166

Notes: OLS regressions presented. Base categories: white-collar for blue-collar. Sample in columns 1–2 restricted to urban working women aged 18–60 at the time of survey in IHDS1 and IHDS2. Sample in columns 3–4 in restricted to urban working men aged 18–60 at the time of survey in IHDS2. Employment measured using the NSS definition of work (*Definition* 1). The regressions also 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 religion, the share of total expenditure on eating outside) controls, and a set of state dummies. The regressions in columns 1 and 2 in Panel A also include an IHDS2 year dummy. Standard errors clustered at the state level in parenthesis. Significance: * p<0.10, ** p<0.05, *** p<0.01.
Reference Categories. [a]: white-collar

Table 9: Regression of BMI on Weighted Intensity of Work

	Women Pooled	***Men IHDS2***
	(1)	(2)
Weighted MET	-0.012*	-0.008
	(0.007)	(0.005)
Sample Size	3,743	5,396

Notes: Dependent variable in the regressions is BMI. OLS regressions presented. Sample in column 1 restricted to urban working women aged 18–60 at the time of survey in IHDS1 and IHDS2. Sample in column 2 restricted to urban working men aged 18–60 at the time of survey in IHDS2. Results using intensity of employment (MET) presented. MET values are constructed by taking the weighted average of the MET values of corresponding three-digit codes, where the weights are given by the number of employees in the sample in each two-digit occupation code. Employment measured using the NSS definition of work (*Definition* 1). The regressions also 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 religion, the share of total expenditure on eating outside) controls, and a set of state dummies. The regressions in columns 1–3 in Panel A also include an IHDS2 year dummy. Standard errors clustered at the state level in parenthesis. Significance: * p<0.10, ** p<0.05, *** p<0.01.

Table 10: Regression of Log of BMI on Sector and Intensity of Work

	Women Pooled		*Men IHDS2*	
	(1)	(2)	(3)	(4)
Blue-collar[a]	-0.019**		-0.013**	
	(0.008)		(0.005)	
Physical Intensity (in MET)		-0.011***		-0.005
		(0.002)		(0.003)
Sample Size	3,743	3,743	5,165	5,165

Notes: Dependent variable in the regressions is log of BMI. OLS regressions presented. Base categories: white-collar for blue-collar. In columns 1 and 2, sample restricted to urban working women aged 18–60 at the time of survey in IHDS1 and IHDS2. In columns 3 and 4, sample restricted to urban working men aged 18–60 at the time of survey in IHDS2. Employment measured using the NSS definition of work (*Definition* 1). Standard errors clustered at the state level in parenthesis. Significance: * p<0.10, ** p<0.05, *** p<0.01.
Reference Categories. [a]: white-collar

Table 11: Analyzing Change in BMI

	(1)	(2)
Panel A: Change in BMI and Change in Sector and Intensity of Work.		
Change from blue to white-collar job	0.263	
	(0.374)	
Change in MET between IHDS1 & 2		-0.025
		(0.118)
Sample Size	608	608
Panel B: Change in BMI and Sector and Intensity of Work in IHDS1		
Blue-collar IHDS1[a]	0.499	
	(0.482)	
Physical Intensity in MET (IHDS1)		-0.166
		(0.150)
Sample Size	851	851

Notes: Dependent variable is change in BMI over the two survey rounds. Employment measured using the NSS definition of work (*Definition* 1). Standard errors clustered at the state level in parenthesis. Significance: * p<0.10, ** p<0.05, *** p<0.01.

Panel A: Fixed-effects results are presented. Base categories: no change in job for change from blue to white-collar job. Sample restricted to urban women, aged 18–60 who are working in both the rounds and who could be tracked across both rounds of the survey. The regressions include time varying 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, the share of total expenditure on eating outside) controls.

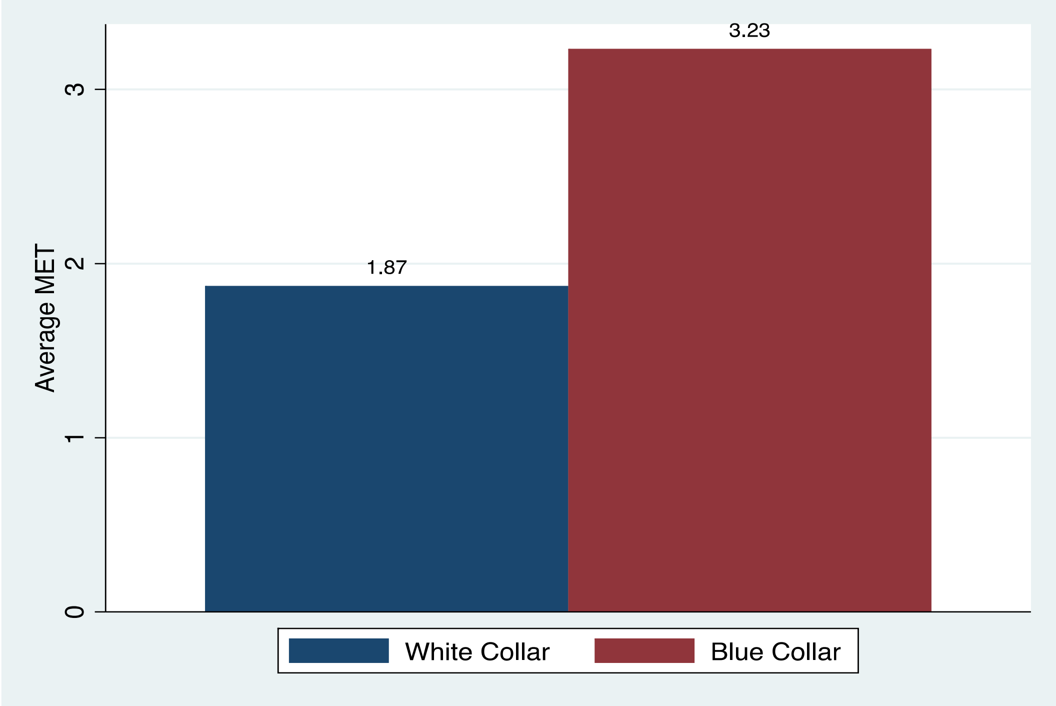
Panel B: OLS regression results presented. Base categories: white-collar for blue-collar. Sample restricted to urban working women, aged 18–60 as of IHDS1 and who could be tracked across both rounds of the survey. Employment measured using the NSS definition of work (*Definition* 1). The regressions 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 religion, the share of total expenditure on eating outside) controls in IHDS1. We also include a set of state dummies.

Reference Categories. [a]: white-collar in IHDS1.

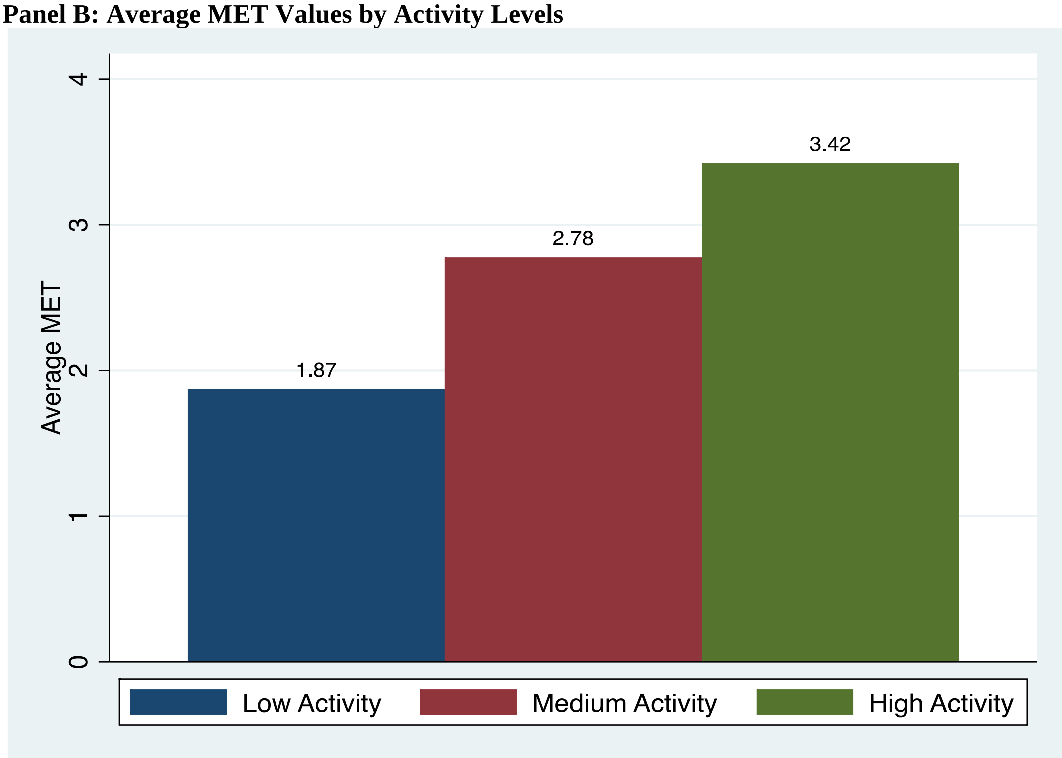
APPENDIX A

Figure A1: Average MET Values by Sector of Work and Activity Levels

Panel A: Average MET Values by Sector of Work

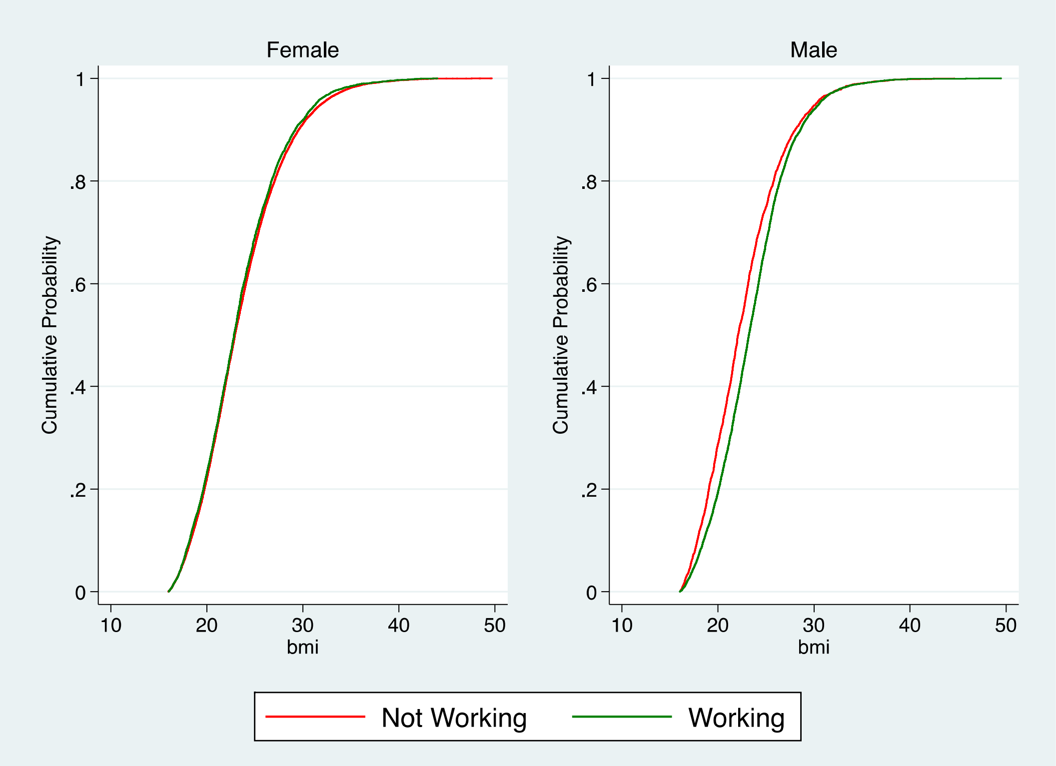


Panel B: Average MET Values by Activity Levels



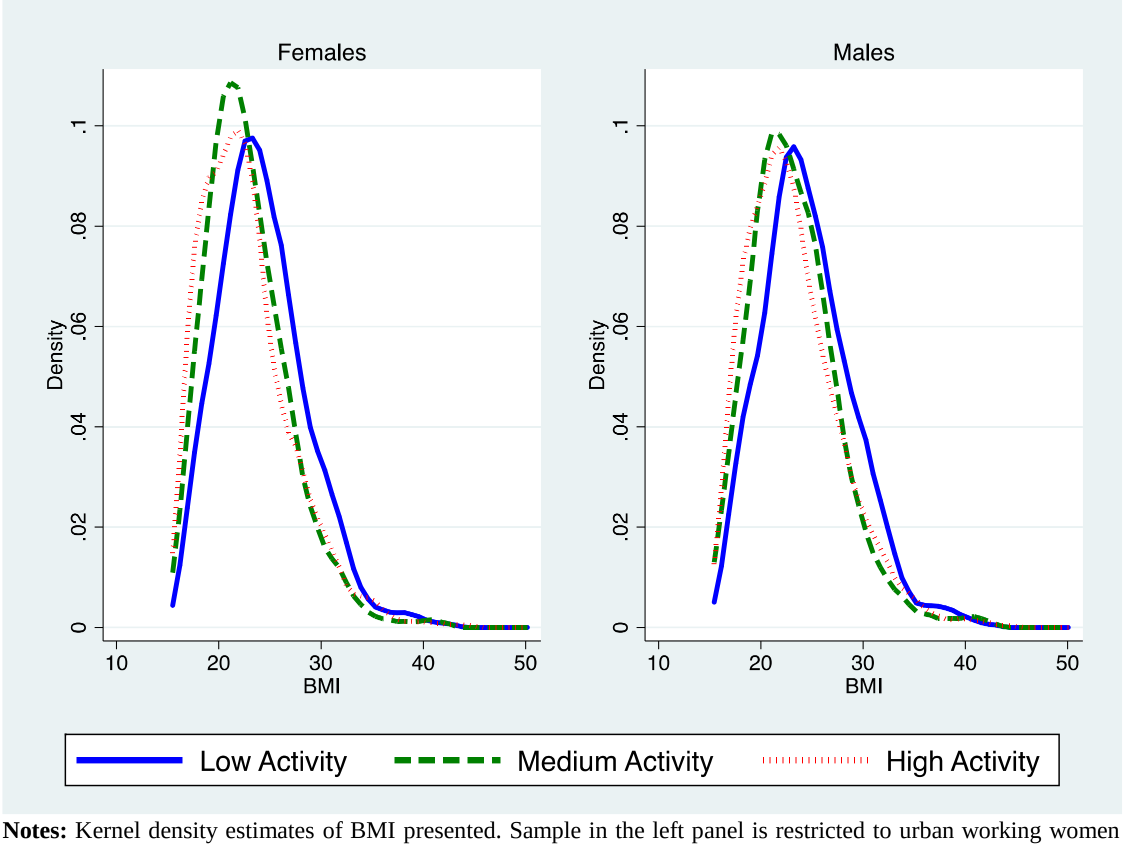
Notes: See Table A1 for the categorization of occupations and Table A2 for the corresponding MET values.

Figure A2: Distribution of BMI by Work Status



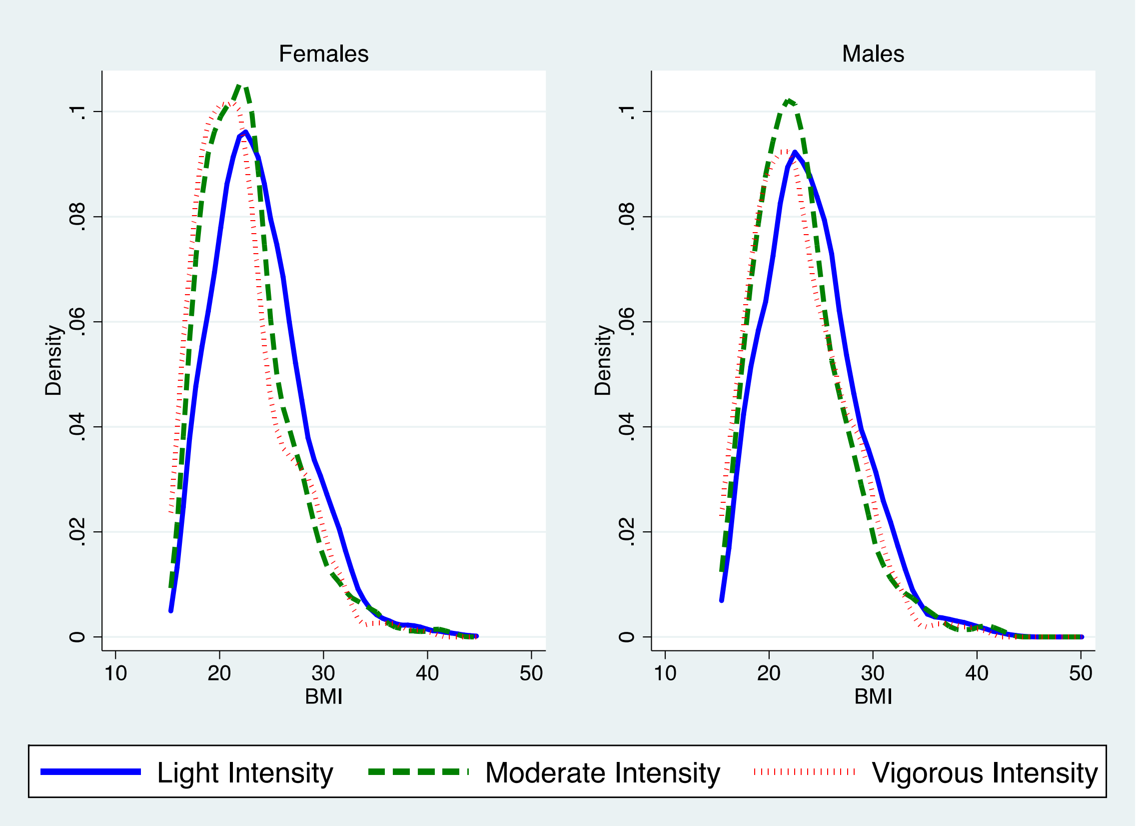
Notes: Cumulative density functions for BMI presented. Sample in the left panel restricted to all urban women aged 18–60 in IHDS1 and IHDS2. In the right panel, sample is restricted to all urban men aged 18–60 in IHDS2.

Figure A3: Distribution of BMI by Activity Levels



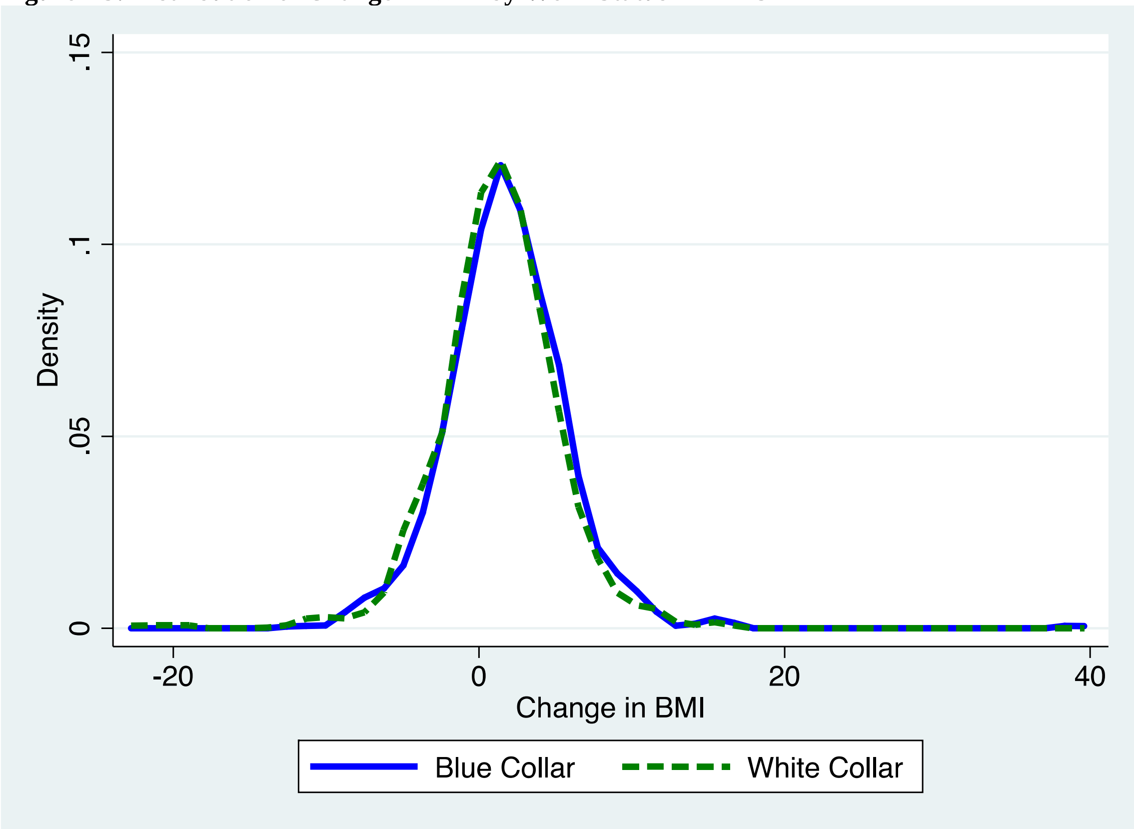
Notes: Kernel density estimates of BMI presented. Sample in the left panel is restricted to urban working women aged 18–60 in IHDS1 and IHDS2. In the right panel, the sample is restricted to urban working men aged 18–60 in IHDS2. See Table A1 for categorization of occupations. Employment defined using *Definition* 1. For the sample of women, Kolmogorov-Smirnoff test p-values for equality of distributions are 0.00, 0.00 and 0.01 for the low and high, low and medium, and medium and high activity occupations, respectively. For the sample of men, Kolmogorov-Smirnoff test p-values for equality of distributions are 0.00, 0.00 and 0.01 for the low and high, low and medium, and medium and high activity occupations, respectively.

Figure A4: Distribution of BMI by Intensity of Activity



Notes: Kernel density estimates of BMI presented. Sample in the left panel is restricted to urban working women aged 18–60 in IHDS1 and IHDS2. In the right panel, the sample is restricted to urban working men aged 18–60 in IHDS2. See Table A1 for categorization of occupations. Employment defined using *Definition* 1. For the sample of women, Kolmogorov-Smirnoff test p-values for equality of distributions are 0.00, 0.00 and 0.15 for the low and high, low and medium, and medium and high activity occupations, respectively. For the sample of men, Kolmogorov-Smirnoff test p-values for equality of distributions are 0.00, 0.00 and 0.65 for the low and high, low and medium, and medium and high activity occupations, respectively.

Figure A5: Distribution of Change in BMI by Work Status in IHDS1



Notes: Kernel density estimates of Change in BMI over the two survey waves presented. Sample includes urban women who are in the sample in both waves and working in IHDS1. See Table A1 for categorization of occupations. Employment defined using *Definition* 1.

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 Occupations

Two-digit Occupation Code	Occupations	Two-digit MET Value	Intensity of Occupation	Sector of Occupation	Type of Activity
00	Physical Scientists	1.80	Light	White-collar	Low Activity
01	Physical Science Technicians	2.50	Light	White-collar	Low Activity
02	Architects, Engineers, Technologists and Surveyors	1.60	Light	White-collar	Low Activity
03	Engineering Technicians	2.39	Light	White-collar	Low Activity
04	Aircraft and Ships Officers	2.00	Light	White-collar	Low Activity
05	Life Scientists	2.10	Light	White-collar	Low Activity
06	Life Science Technicians	2.50	Light	White-collar	Low Activity
07	Physicians and Surgeons (Allopathic Dental and Veterinary Surgeons)	2.35	Light	White-collar	Low Activity
08	Nursing and other Medical and Health Technicians	2.42	Light	White-collar	Low Activity
09	Scientific, Medical and Technical Persons, Other	2.50	Light	White-collar	Low Activity
10	Mathematicians, Statisticians and Related Workers	1.50	Light	White-collar	Low Activity
11	Economists and Related Workers	1.50	Light	White-collar	Low Activity
12	Accountants, Auditors and Related Workers	1.50	Light	White-collar	Low Activity
13	Social Scientists and Related Workers	1.94	Light	White-collar	Low Activity
14	Jurists	1.50	Light	White-collar	Low Activity
15	Teachers	2.50	Light	White-collar	Low Activity
16	Poets, Authors, Journalists and Related Workers	1.50	Light	White-collar	Low Activity
17	Sculptors, Painters, Photographers and Related Creative Artists	3.00	Light	White-collar	Low Activity
18	Composers and Performing Artists	2.33	Light	White-collar	Low Activity
19	Professional Workers, NEC	2.20	Light	White-collar	Low Activity
20	Elected and Legislative Officials	1.50	Light	White-collar	Low Activity
21	Administrative and Executive Officials Government and Local Bodies	2.00	Light	White-collar	Low Activity
22	Working Proprietors, Directors and Managers, Wholesale and Retail Trade	1.50	Light	White-collar	Low Activity
23	Directors and Managers, Financial Institutions	1.50	Light	White-collar	Low Activity
24	Working Proprietors, Directors and Managers Mining, Construction, Manufacturing and Related Concerns	1.90	Light	White-collar	Low Activity
25	Working Proprietors, Directors, Managers and Related Executives, Transport, Storage and Communication	1.50	Light	White-collar	Low Activity

26	Working Proprietors, Directors and Managers, Other Service	1.58	Light	White-collar	Low Activity
29	Administrative, Executive and Managerial Workers, NEC	1.50	Light	White-collar	Low Activity
30	Clerical and Other Supervisors	1.75	Light	White-collar	Low Activity
31	Village Officials	1.50	Light	White-collar	Low Activity
32	Stenographers, Typists and Card and Tape Punching Operators	1.65	Light	White-collar	Low Activity
33	Book-keepers, Cashiers and Related Workers	1.75	Light	White-collar	Low Activity
34	Computing Machine Operators	1.50	Light	White-collar	Low Activity
35	Clerical and Related Workers, NEC	1.72	Light	White-collar	Low Activity
36	Transport and Communication Supervisors	2.17	Light	White-collar	Low Activity
37	Transport Conductors and Guards	2.00	Light	Blue-collar	Medium Activity
38	Mail Distributors and Related Workers	3.33	Moderate	Blue-collar	Medium Activity
39	Telephone and Telegraph Operators	1.50	Light	White-collar	Low Activity
40	Merchants and Shopkeepers, Wholesale and Retail Trade	1.50	Light	White-collar	Low Activity
41	Manufacturers, Agents	1.75	Light	White-collar	Low Activity
42	Technical Salesmen and Commercial Travelers	2.00	Light	White-collar	Low Activity
43	Salesmen, Shop Assistants and Related Workers	2.50	Light	Blue-collar	Medium Activity
44	Insurance, Real Estate, Securities and Business Service Salesmen and Auctioneers	1.83	Light	White-collar	Low Activity
45	Money Lenders and Pawn Brokers	1.50	Light	White-collar	Low Activity
49	Sales Workers, NEC	2.50	Light	Blue-collar	Medium Activity
50	Hotel and Restaurant Keepers	2.00	Light	Blue-collar	Medium Activity
51	House Keepers, Matron and Stewards (Domestic and Institutional)	3.50	Moderate	Blue-collar	Medium Activity
52	Cooks, Waiters, Bartenders and Related Worker (Domestic and Institutional)	2.75	Light	Blue-collar	Medium Activity
53	Maids and Other House Keeping Service Workers NEC	4.50	Moderate	Blue-collar	Medium Activity
54	Building Caretakers, Sweepers, Cleaners and Related Workers	3.25	Moderate	Blue-collar	Medium Activity
55	Launderers, Dry-cleaners and Pressers	2.67	Light	Blue-collar	Medium Activity
56	Hair Dressers, Barbers, Beauticians and Related Workers	2.50	Light	Blue-collar	Medium Activity
57	Protective Service Workers	2.83	Light	Blue-collar	Medium Activity
59	Service Workers, NEC	2.67	Light	Blue-collar	Medium Activity
60	Farm Plantation, Dairy and Other Managers and Supervisors	3.00	Moderate	Blue-collar	High Activity
61	Cultivators	4.8	Moderate	Blue-collar	High Activity
62	Farmers other than cultivators	4.28	Moderate	Blue-collar	High Activity

63	Agricultural Laborers	6.00	Vigorous	Blue-collar	High Activity
64	Plantation Laborers and Related Workers	6.00	Vigorous	Blue-collar	High Activity
65	Other Farm Workers	3.25	Moderate	Blue-collar	High Activity
66	Forestry Workers	5.00	Moderate	Blue-collar	High Activity
67	Hunters and Related Workers	3.00	Moderate	Blue-collar	High Activity
68	Fishermen and Related Workers	5.00	Moderate	Blue-collar	High Activity
71	Miners, Quarrymen, Well Drillers and Related Workers	4.25	Moderate	Blue-collar	High Activity
72	Metal Processors	2.98	Light	Blue-collar	High Activity
73	Wood Preparation Workers and Paper Makers	2.92	Light	Blue-collar	High Activity
74	Chemical Processors and Related Workers	2.71	Light	Blue-collar	High Activity
75	Spinners, Weavers, Knitters, Dyers and Related Workers	2.73	Light	Blue-collar	High Activity
76	Tanners, Fellmongers and Pelt Dressers	3.25		Blue-collar	High Activity
77	Food and Beverage Processors	2.70	Light	Blue-collar	High Activity
78	Tobacco Preparers and Tobacco Product Makers	2.92	Light	Blue-collar	High Activity
79	Tailors, Dress Makers, Sewers, Upholsterers and Related Workers	2.29	Light	Blue-collar	High Activity
80	Shoe makers and Leather Goods Makers	2.50	Light	Blue-collar	High Activity
81	Carpenters, Cabinet and Related Wood Workers	3.43	Moderate	Blue-collar	High Activity
82	Stone Cutters and Carvers	2.83	Light	Blue-collar	High Activity
83	Blacksmiths, Tool Makers and Machine Tool Operators	3.31	Moderate	Blue-collar	High Activity
84	Machinery Fitters, Machine Assemblers and Precision Instrument	3.08	Moderate	Blue-collar	High Activity
85	Electrical Fitters and Related Electrical and Electronic Workers	2.94	Light	Blue-collar	High Activity
86	Broadcasting Station and Sound Equipment Operators and Cinema Projectionists	2.00	Light	Blue-collar	Medium Activity
87	Plumbers, Welders, Sheet Metal and Structural Metal Preparers and Erectors	4.42	Moderate	Blue-collar	High Activity
88	Jewelry and Precious Metal Workers and Metal Engravers (Except Printing)	1.50	Light	Blue-collar	High Activity
89	Glass Formers, Potters and Related Workers	2.50	Light	Blue-collar	High Activity
90	Rubber and Plastic Product Makers	3.10	Moderate	Blue-collar	High Activity
91	Paper and Paper Board Products Makers	2.83	Light	Blue-collar	High Activity
92	Printing and Related Workers	1.85	Light	Blue-collar	High Activity
93	Painters	2.88	Light	Blue-collar	High Activity
94	Production and Related Workers, NEC	2.90	Light	Blue-collar	High Activity
95	Bricklayers and Other Constructions Workers	4.35	Moderate	Blue-collar	High Activity

96	Stationery Engines and Related Equipment Operators, Oilers and Greasors	3.10	Moderate	Blue-collar	High Activity
97	Material Handling and Related Equipment Operators, Loaders and Unloaders	3.69	Moderate	Blue-collar	High Activity
98	Transport Equipment Operators	2.73	Light	Blue-collar	Medium Activity
99	Laborers NEC	5.00	Moderate	Blue-collar	High Activity

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: OLS Regression of BMI in IHDS1 on Withdrawal from the Labour Market in IHDS2

	Definition 1	***Definition 2***
	(1)	(2)
BMI in IHDS1	0.003	0.001
	(0.005)	(0.004)
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 religion, the share of total expenditure on eating outside) controls, and a set of state dummies. Standard errors clustered at the state level in parenthesis. Significance: * p<0.10, ** p<0.05, *** p<0.01.

Table A4: Regression of BMI on Sector and Intensity of Work

	Urban working women aged 18-60		*Urban working men aged 18-60*	
	(1)	(2)	(3)	(4)
Medium Activity[a]	-0.287		-0.066	
	(0.291)		(0.122)	
High Activity[a]	-0.537***		-0.496***	
	(0.160)		(0.138)	
Moderate Intensity[b]		-0.373		-0.279*
		(0.225)		(0.144)
Vigorous Intensity[b]		-0.796***		0.221
		(0.161)		(0.326)
Sample size	3,743	3,743	5,165	5,165

Notes: Dependent variable in the regressions is BMI. OLS regressions presented. Base categories: low activity for medium and high activity, light intensity for moderate and vigorous intensity. Employment measured using the NSS definition of work (*Definition* 1). In columns 1–2, the sample is restricted to 18–60 year-old working urban women at the time of survey in IHDS1 and IHDS2. In columns 3–4, the sample is restricted to 18–60-year-old working urban men in IHDS2. 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 religion, the share of total expenditure on eating outside) controls, and a set of state dummies. The regressions for women also include an IHDS2 year dummy. Standard errors clustered at the state level in parenthesis. Significance: * p<0.10, ** p<0.05, *** p<0.01.

Reference Categories. [a]: Low Activity; [b]: Light Intensity

Table A5: Regression of BMI on Sector and Intensity of Work Using *Definition 2*

	Urban Working Women Aged 18–60				*Urban Working Men Aged 18–60*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Blue-Collar[a]	-0.413*				-0.335***			
	(0.202)				(0.111)			
Medium Activity[b]		-0.133				-0.077		
		(0.271)				(0.128)		
High Activity[b]		-0.553***				-0.483***		
		(0.190)				(0.129)		
MET			-0.250***				-0.119*	
			(0.061)				(0.066)	
Moderate Intensity[c]				-0.439*				-0.275**
				(0.243)				(0.122)
Vigorous Intensity[c]				-0.762***				0.057
				(0.120)				(0.278)
Sample	4,574	4,574	4,574	4,574	5,491	5,491	5,491	5,491

Notes: Dependent variable in the regressions is BMI. OLS regressions presented. Base categories: white-collar for blue-collar, low activity for medium and high activity, light intensity for moderate and vigorous intensity. Employment measured using the IHDS Definition of work (*Definition* 2). In columns 1–4, the sample is restricted to 18-60 year-old working urban women at the time of survey in IHDS1 and IHDS2. In columns 5–8, the sample is restricted to 18-60 year-old working urban men in IHDS2. 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 religion, 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 in parenthesis. Significance: * p<0.10, ** p<0.05, *** p<0.01.

Reference Categories. [a]: White collar; [b]: Low Activity; [c]: Light Intensity

Table A6: Regression of BMI on Sector and Activity Levels of Work Using *Definition 2*. Full Sample

	All Urban Women Aged 18–60		*All Urban Men Aged 18–60*	
	(1)	(2)	(3)	(4)
White-collar[a]	-0.264		0.046	
	(0.165)		(0.167)	
Blue-collar[a]	-0.718***		-0.299***	
	(0.124)		(0.091)	
Low Activity[b]		-0.263		0.047
		(0.165)		(0.168)
Medium Activity[b]		-0.400**		-0.031
		(0.192)		(0.136)
High Activity[b]		-0.873***		-0.448***
		(0.148)		(0.101)
Sample Size	22,584	22,584	7,193	7,193

Notes: Dependent variable in regressions is BMI. OLS regression results presented. Base categories: not-working for white and blue collar, not working for low, medium and high activity. Employment measured using the IHDS Definition of work (*Definition* 2). In columns 1 and 2, sample restricted to 18-60 year-old urban women at the time of survey in IHDS1 and IHDS2. In columns 3 and 4, sample restricted to 18-60 year-old urban men in IHDS2. 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 religion, the share of total expenditure on eating outside) controls, and a set of state dummies. The regressions in columns 1 and 2 also include an IHDS2 year dummy. Standard errors clustered at the state level in parenthesis. Significance: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Reference Categories. [a]: Not Working; [b]: Not Working