

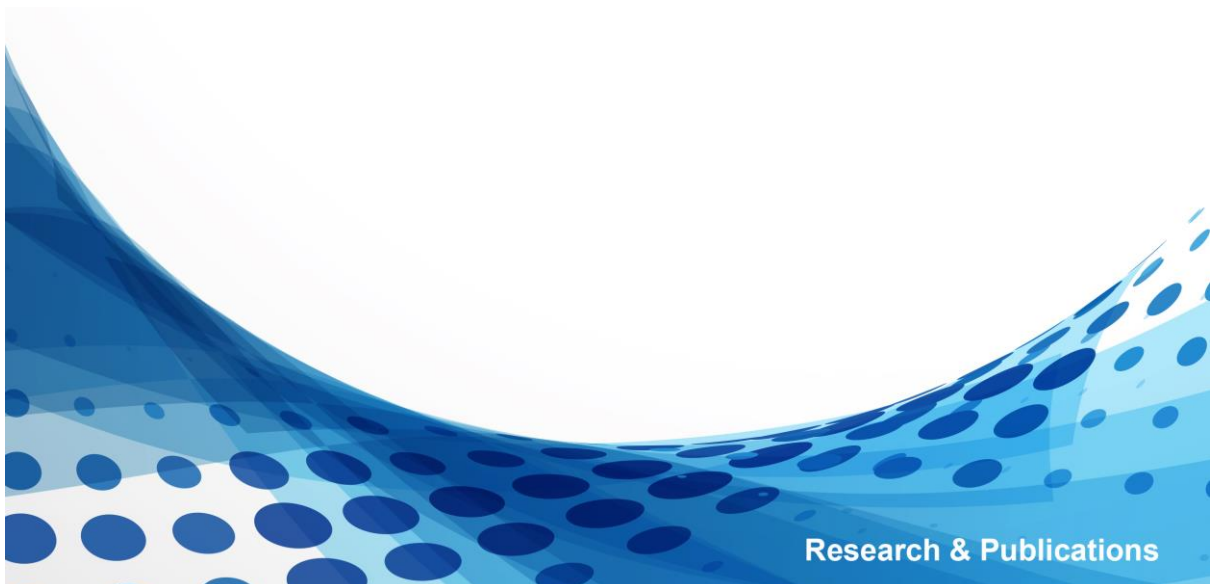


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COVID-19 and Period Products Usage among Menstruating Women in Urban and Rural India

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Research & Publications

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November 2021

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Abstract

Background

This paper estimates the impact of the government-mandated intensity of the lockdown across various zones on the period product consumption for menstruating women in India.

Methods

We have used the national-level panel data from the Centre for Monitoring Indian Economy (CMIE)'s Consumer Pyramids Household Survey (CPHS) database across 510 districts of India, along with the lockdown zones data. Our study uses a robust strategy to exploit the temporal (pre vs. during lockdown) and spatial (across red, orange, and green zones) variation by using difference-in-difference estimates by exploring the impact of lockdown policy on period products expenditure over households from October 2019 to May 2020.

Findings

Our results show reduction of 27% in period products consumption in red zone districts compared to the green zone districts. When restricting attention to rural districts only, this reduction was 33%.

Interpretation

Travel restrictions on consumers combined with restrictions on movements of goods led to severe shortages in period products. There is a strong need to start interventions to improve the period products usage and create robust infrastructure to ensure deliveries, especially during emergencies.

Funding

Authors did not receive any funding for the study.

Keywords: COVID-19, Lockdown, Containment Policies, Period Products, Menstruation, CMIE, CPHS, India.

Introduction

The current pandemic, and its accompanying lockdown, has severely impacted the access to menstrual products for those who menstruate, especially in low and middle-income countries. There was already a gap in provisioning of period products and adequate sanitation facilities to fulfil menstrual needs which has been further exacerbated during the pandemic^{1,2}. The period product crisis across the world have been covered as a part of commentary pieces^{3,4} or small surveys clubbed with other topics of health⁵ or reports based on very small numbers (less than a hundred) covering multiple countries^{6,7}. While these commentary pieces and reports provide valuable insights into the problem, in this paper, we attempt to uncover the extent of the problem as a nationwide period product crisis focusing on India.

Multiple studies have been conducted in the past to understand the effectiveness of the lockdown on imposition of fines⁸, nightlight intensity⁹, domestic violence¹⁰, however, to the best of our knowledge, there are no studies to understand the impact of the lockdown on the women's reproductive health and its associated outcomes. This is the first study to understand the effect of the COVID-19 pandemic on period product consumption. Our paper uses a combination of temporal (lockdown versus pre-lockdown) and spatial (government-mandated classification of districts into red, orange, and green zones) variation, which helps us exploit the lockdown as a natural experiment across 510 districts of India. We are able to assess the impact of lockdown intensity on period product consumption for households with menstruating women¹. The primary dataset employed in the study is the CMIE's Consumer Pyramid Health Survey (CPHS) dataset from which we used data on the expenditure by households on the period products.

Our results highlight a reduction in consumption in both the intensive and extensive margin. Comparing red and green districts, we find a reduction in the number of households with expenditure on period products and a reduction in the amount spent by households. We also find that rural districts were particularly badly impacted. The pandemic and its associated economic lockdown led to drop in overall income and consumption for households across the country. This reduction in expenditure can be reasonably be expected to reflect across expenditure categories including period products even though the expenditure on period products is a minuscule fraction of the overall expenditure by the household. The novel finding of this paper is how the period product usage is impacted across zones. The reduction in expenditure in red zones vs green zones during the lockdown highlights the impact of curbs on movement which impacted both the consumers' ability to get to the shops as well as the movement of goods. Our results highlight the need to keep public policy focus on period products and menstrual hygiene and to understand the differential impact on period products of travel restrictions.

To the best of our knowledge, this is the first study to understand the effect of the COVID-19 pandemic on period product consumption across various socio-demographic factors.

¹ Menstruating women includes women in the age group of 10 to 40 years.

Additionally, most research around menstruation has been focused on adolescent schoolgirls^{11,12} and less attention has been paid to women's menstrual experiences at other life stages. Our paper focuses not only on households with young schoolgirls but also on those with non-schooled girls and women up to 40 years old, thus, contributing to the literature on the period products consumption of non-schooled girls and women. Finally, we also contribute to the literature on the access to the period products during the emergency across rural and urban India.

Methods

COVID-19 containment strategy in India

India reported its first COVID-19 infection on 30th January 2020. The government started introducing restrictions on international travel and promoting physical distancing in February and March 2020. On 24th March 2020, the Government of India (GoI) imposed a 21-day lockdown in the country¹³. India imposed one of the most stringent lockdowns, restricting all the economic activities except the essential services¹⁴. During this phase, almost all the services, including commercial and private shops, industries, public services, local and international travel, hospitality services, educational institutes, and other non-essential services, were closed. This initial lockdown was further extended until May 3, 2020. Starting from May 4, 2020, the GoI announced “Lockdown 3.0”, where districts were classified into three zones i.e., red, orange and green depending on the number of COVID-19 cases, recovery rates, the magnitude of testing and susceptibility to the pandemic. The government classified 130 districts into red zones, 284 in orange zones, and 319 into green zones¹⁵. We consider this zonal classification by GoI as the exogenous implementation of the government’s containment policy to overcome the COVID-19 pandemic. Different guidelines were issued for different zones with the strictest restrictions imposed on red zones followed by orange zones and the least restrictions imposed on green zones.

After the zonal classification, most of the economic activities resumed in the green zones. Goods traffic was permitted, and citizens' movement was allowed for essential and non-essential services between 7 AM to 7 PM. However, bus, rail, metro, air travel, and inter-state road travel were not permitted. Hospitality services, educational institutes, public gathering places, including temples, mosques, cinema halls, and malls, remain closed. In orange zones, there were additional restrictions on movement. Only cabs and taxis with a driver and a maximum of two passengers were allowed to operate. Only a few activities were permitted for which inter-district movement was allowed. In red zones, industries were prohibited from working in the urban areas, except in the Special Economic Zones (SEZs) and townships with access controls. Private employers were asked to resume their work, however, only with one-third of the total capacity. However, construction activities remain prohibited in the red zones. The state governments could not palliate the zonal restrictions as outlined by the central government.

Data

We combine multiple sources of district-level data for the study. This paper uses the CMIE's CPHS data to understand the household level consumption of period products, a nationally representative household-level panel since January 2014. Since the NFHS-4 data is only available for 2015-16, the CMIE's CPHS data is the only national-level dataset that provides us information on the period products usage, especially during the time period of the lockdown. Every household is surveyed three times every year. During the April 2020, there was a dip in data collection due to the complete lockdown. CMIE shifted to phone surveys and successfully implemented the survey during the lockdown². It delivers the longitudinal data collected using an all-India representative sample of over 17000 households. We trimmed the data at 99% confidence interval to account for the outliers.

As a part of this study, we have used Wave 18, Wave 19, and Wave 20 CPHS unit-level data covering a period of October 2019 to May 2020. Using the data from these three waves allows us to observe household's pre-lockdown and during the lockdown. We take the period from October 2019 to March 2020 as the pre-lockdown period and use April to May 2020 as the lockdown period. The survey asks the households to recall their monthly expenses under various headings for the past four months. We used data on expenditure on hygiene products for the study, which includes expenses for diapers and period products. To focus on period products, we drop the data for the households with children under the age of 2 as the expenditures for these households will be predominately towards the diapers.

We combined the data obtained from the CPHS database with the data obtained from the Ministry of Home Affairs, India, about the lockdown zone categories across various districts.

Empirical Strategy

The Indian government's classification of the districts across red, orange, and green zones helps us exploit the quasi-random nature of the data and use the panel structure of district and month level data. We use the following difference-in-difference specification:

$$Y_{hdm} = \alpha_0 + \alpha_1 * \text{Lockdown}_m + \alpha_2 * \text{Zone}_d + \alpha_3 * (\text{Zone}_d * \text{Lockdown}_m) + \alpha_4 X_{hdm} + \lambda_m + \delta_d + \varepsilon_{hdm} \quad (1)$$

where Y_{hdm} is the expenditure on the period products by the household 'h' in the district 'd' and month 'm'. Lockdown_m is a binary variable, which takes the value 0 for the pre-lockdown era, i.e., October 2019 to March 2020, and 1 for the lockdown, i.e., April 2020 to May 2020. Zone_d is a categorical variable with values 1, 2, and 3 for green, orange, and red zones, respectively. X_{hdm} includes the control variables at the household levels (see Table C1 for more details). All the standard errors were clustered at the district levels. We used month fixed effects, λ_m , and district fixed effects, δ_d , to capture time-invariant and district characteristics across months related to period products consumption. All expenditure numbers were appropriately deflated using RBI estimates of inflation.

²This link explains the entire process adapted by the CMIE during the lockdown in detail.
<https://consumerpyramidsdx.cmie.com/kommon/bin/sr.php?kall=wkb>

The coefficient α_1 captures the impact of the lockdown on the period product consumption during the lockdown (April 2020 to May 2020) relative to the pre-lockdown period (October 2019 to March 2020), and α_2 captures any differences by the zonal classification on the period products consumption in the districts falling in the orange and green zones relative to the districts in the red zones. Our variable of interest is α_3 which captures the differential impact of the districts in the red and orange zones relative to the districts in the green zones before and during the lockdown period relative to the pre-lockdown period on household expenditure on the period products in India.

To understand the changes along the extensive margin, we also use as dependent variable a binary variable which takes value '1' if expenditure on period products is greater than zero and otherwise '0'. We use the following difference-in-difference specification:

$$\text{Logit}(Z_{hdm} | \text{Lockdown}, \text{Zone}, X_{hdm}) = \beta_0 + \beta_1 * \text{Lockdown}_m + \beta_2 * \text{Zone}_d + \beta_3 * (\text{Zone}_d * \text{Lockdown}_m) + \beta_4 X_{hdm} + \delta_d + \lambda_m + \varepsilon_{hdm} \quad (2)$$

where Z_{hdm} is the binary variable for the household 'h' in the district 'd' who have spent money on the period products in the month 'm'. Our variable of interest is β_3 which captures the differential impact of the districts in the red and orange zones relative to the districts in the green zones before and during the lockdown period relative to the pre-lockdown period on the households decision to spend on period products or not. Additional robustness checks including random assignment of the zones and controlling for the number of the women using sanitary items at the district level were run to confirm the study's findings and can be seen in the Appendix section.

Results

We first highlight the trends using descriptive statistics. We first discuss the total expenditure by households on period products. Table 1 presents the expenditure on the period products across the zone in the pre-lockdown era and during the lockdown. We can see a clear impact of the lockdown on the expenditure on period products as there was a clear dip in the average amount spent on the period products during the lockdown across all the zones. Red Zones saw the highest drop (~31%) in the average expenditure spent on the period products, followed by orange (~20%) and green (~18%) zones.

We next consider expenditure by the households on the period products across the zone in the pre-lockdown and during the lockdown across urban and rural areas. There was a clear impact of the lockdown in both rural and urban areas. Red zones saw the highest dip of 30% in both urban and rural areas. Orange zones saw a drop of 23% and 18%, followed by 14% and 20% in green zones across rural and urban areas, respectively.

We next discuss the households' decision to spend on period products or not. Around 37% of the households had spent on the period products from Oct 2019 to May 2020. The average

number of households spending on the period products before the lockdown was around 38%, whereas it reduced to 32% during the lockdown. Next, we checked the expenditure on the period products in the urban and rural areas. In urban areas, 39% of the households spent on the period products in the pre-lockdown months, which reduced to 33% during the lockdown. Similarly, 35% of the households spent on the period products in the pre-lockdown era in rural areas, which were further reduced to 31% during the lockdown. Multiple control variables (at menstruating and household level) were considered while running the results. Descriptive statistics for the control variables are presented in Table C1.

Parallel-Trends assumption

We checked for pre-trends by analysing the impact of the zonal classifications on the period products consumption in the pre-lockdown months, i.e., Oct 2019 to Mar 2020. Zonal classifications created in May 2020 to fight against the spread of the COVID-19 infection should not impact the period products consumption in the pre-lockdown months. We use the following difference-in-difference specification for Y_{hdm} which measures period product consumption for the household 'h' in the district 'd' for the month 'm':

$$Y_{hdm} = \beta_0 + \beta_{rm} * Red_d * Month_m + \beta_{om} * Orange_d * Month_m + \beta_3 X_{hdm} + \lambda_m + \delta_d + \varepsilon_{hdm} \text{ ---- (3)}$$

The variables Red_d and $Orange_d$ are binary variables measuring if the district is classified as Red or Orange while $Month_m$ is an indicator variable for the m-th month for each of the months in the period Oct 2019 to Mar 2020. We modify the above equation to a logistic equation to model the household's decision to spend on period products. We expect the coefficients β_{rm} and β_{om} to be null and insignificant if the parallel trends assumption holds in our setting.

Figure 1 and 2 shows the pre-trends for the red and orange zones for the pre-lockdown months at the India level and then across rural and urban areas of India for period products expenditure and decision to spend on period products, respectively. With a few exceptions, we see that most of the coefficients for the red and orange zones in the pre-lockdown era are either statistically indistinguishable or close to zero, suggesting that our final results are not driven by the pre-existing trends of the period products expenditure and the decision to spend on the period products.

Period Products: Total Expenditure

We report the differential impact of the lockdown on the period product expenditure for menstruating women using equation (1), as depicted in Col (1) of Table 2. Our analysis indicated that lockdown significantly reduced the period products expenditure. Our DID estimates shows that lockdown reduced the period product consumption by Rs 5.50 (95% CI=−10.92, −0.087; P=.046) on a base of Rs 20.22 (27%³) across India in red zones as compared to

³ Percentage is calculated as the coefficient for the reduction in the expenses for period products divided by the mean of the expenditure for period products.

the green zones. However, there was no significant impact of the lockdown on periods product consumption in the orange zones.

Col (2)-(3) of Table 2 reports the differential impact of the lockdown on the period product expenditure for households in urban and rural areas of India. Our DID estimates show a significant impact of the lockdown on the period products consumption in rural areas by Rs 5.66 (95% CI=-10.12, -1.20; P=.013) on a base of Rs 17.03 (33%). However, there was no significant impact of the lockdown on menstruating women in urban areas.

Table C4 shows the results from equation (1) using different expenditure levels such as expenditure on intoxicants, bidis, alcohol, tobacco and cosmetics. We see that there is a strong effect of a lockdown for all these expenditures (except bidis) but no further effect of zones and lockdown. We saw a negative effect of the lockdown on the sale of bidis; however, this effect was insignificant. The impact of the lockdown highlights how households experienced a negative income shock which led to a reduction in consumption. The interaction of red zone with lockdown shows a significant effect only on period products which highlights how restrictions on movement had a very different impact on period products which was not seen for other products.

Period Products: Decision to Spend

Table 3 reports the results of the differential impact of the lockdown and zones for the binary dependent variable, measuring if the households had an expenditure on period products or not. Our DID estimates shows that lockdown reduced the odds of period product consumption by 0.70 (95% CI=-1.34, -0.050; P=.035) across India in red zones as compared to the orange zones. Similarly, we found that the lockdown reduced the odds of period products consumption by 0.74 (95% CI=-1.38, -0.085; P=.026) in red zones as compared to the orange zones in the rural areas. In contrast, there was no significant effect of the lockdown on the period products consumption in the urban areas. Our overall estimates for logit DID are similar to those in Table 2 for the reduction in the period products consumption for both the overall as well as the urban and rural sample. These combined results show that the expenditure on the period products during the lockdown fell more in the red zones than in the green zones, and the rural areas drove these differences.

Discussion

Over 800 million people were menstruators worldwide during the COVID-19 pandemic, however, an estimated 500 million of them could not meet their menstrual needs. However, multiple newspaper reports have shown that access to the period products has been limited during the COVID-19 lockdown in India. Thus, we try to understand the impact of COVID-19 containment policies on the period product consumption of those who menstruate. Our results have shown a negative effect of the lockdown on the period products usage in India overall and especially in rural areas.

Several newspaper reports have highlighted the shortage of period products during the lockdown. The Government of India did not include period products in the initial list of the essential items. After a massive outcry on social media, a week later, on 30th March, the government included the period products in the list; however, initial exclusion of period products disrupted the supply of period products with the suspension of its manufacturing plants (initially) and transportation, ultimately leading to the stockout of products in a few locations. Newspaper reports also highlighted the shortage and increased price of the period products across the different countries.

Our results show that households with menstruating women in rural areas were more likely to choose to not spend at all on period products and also to spend less on period products during the lockdown. Women in the rural areas and villages had to travel to nearby towns to access period products (Babbar, Saluja, & Sivakami, 2021). Lockdown restricted the movement of these women, and they had to switch to homemade solutions, including old cloth and rags. Period products manufactured by the local SHGs, small-scale units were affected due to a lack of workers and transport (Muralidharan & Mahajan, 2020). Similarly, girls and women dependent on the period products offered by the schools, low-cost products available via Accredited Social Health Activist (ASHA), and small self-help groups (SHGs) had to switch to the other alternatives.

Previous studies have shown that there are multiple taboos and myths around menstruation including lack of access to the period products¹⁶⁻¹⁸. Our results highlight a similar story as households are quick to reduce their consumption of period products in times of crisis even though expenditure on such products is very small as compared to their overall expenditure.

Our results reiterate findings from the other surveys. For instance, a survey conducted on approximately 5000 women aged 18 to 35 in India found that 16% of their sample had limited to no access to period products from March to November 2020 and attributed affordability as one of the main concerns. Thus, lockdown halted the period products usage among these women due to affordability issues. With the loss of livelihoods, those who menstruate need to prioritize other basic needs over menstrual needs.

COVID-19 pandemic and its associated lockdown created affordability issues, along with the poor supply of low-cost pads for the government and other SHGs. One alternative to overcome such barriers is to improve the existing distribution mechanisms of period products. Period product distribution via community health workers or in community buildings has been inaccessible. In such situations, divisional administrators can gather, and release period products stocked on behalf of state governments and ensure accessibility across geographies by engaging with various frontline workers, SHGs, community volunteers, and NGOs working within the villages. This can be a potential step in paving the way to a good menstrual health and hygiene and can be incorporated by using a decentralized approach and setting up state and district-level guidelines.

Another suggestion would be to shift the focus merely from distributing the sanitary napkins to explore and educate the individuals who menstruate on (a) providing information of the various sanitary items so that the individuals can make an informed choice about the products they use (b) the best possible ways to manage the menstrual needs and improve the existing curricula on menstrual health¹⁹.

To conclude, the COVID-19 pandemic has exacerbated the existing gender inequalities. MHH is often neglected, especially during times of emergencies. Despite the noble intentions and well-thought-out plans, the distribution mechanism of the period products falls flat on the ground when it comes to implementation. The government and associated private players should learn from the pandemic, address their shortcomings, and develop a more robust distribution mechanism and intervention plans to improve period product usage and sure-shot deliveries, especially during the emergency crisis in the remotest of the villages.

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Tables and Figures

Table 1. Period Product Expenditure at the household across various zones before and during the lockdown across Urban and Rural India

Zone/Lockdown	Overall			Urban Area			Rural Area		
	Red Zone	Orange Zone	Green Zone	Red Zone	Orange Zone	Green Zone	Red Zone	Orange Zone	Green Zone
Pre- Lockdown	26.01	19.37	17.76	28.82	20.24	18.44	18.91	17.75	16.68
Lockdown	18.04	15.62	14.61	20.08	16.51	14.73	13.18	13.74	14.33

Table 2. Differential Impact of Lockdown and Zone on the Period Product Expenditure

VARIABLES	(1)	(2)	(3)
	India	Urban	Rural
Orange Zone	54.85 (35.74, 73.97)	63.30 (49.31, 77.30)	61.07 (57.75, 64.39)
Red Zone	36.94 (29.47, 44.40)	28.17 (18.68, 37.66)	30.91 (29.18, 32.64)
Lockdown	-3.62 (-7.51, 0.26)	-3.45 (-8.38, 1.48)	-3.95 (-7.19, -0.71)
Lockdown*Orange Zone	-1.51 (-5.72, 2.70)	-1.65 (-7.01, 3.70)	-1.20 (-4.79, 2.37)
Lockdown* Red Zone	-5.50 (-10.92, -0.08)	-5.43 (-12.51, 1.65)	-5.66 (-10.12, -1.20)
Constant	-22.26 (-36.74, -7.78)	-17.63(-31.00, -4.26)	-44.58 (-56.39, -32.77)
Observations	4,14,386	2,70,147	1,44,239
Number of households	69,292	44,654	24,638

The DiD results are reported with 95% confidence intervals.

Table 3. Differential Impact of Lockdown and Zones on households with spending on Period Products

VARIABLES	(1)	(2)	(3)
	India	Urban	Rural
Orange Zone	-0.33 (-0.97, 0.30)	-0.38 (-1.16, 0.40)	-0.21 (-0.92, 0.51)
Red Zone	-0.21 (-0.53, 0.95)	0.21 (-0.67, 1.09)	0.05 (-0.82, 0.92)
Lockdown	-0.12 (-0.69, 0.44)	-0.08 (-0.75, 0.59)	-0.23 (-0.87, 0.41)
Lockdown*Orange Zone	-0.39 (-0.99, 0.22)	-0.39 (-1.11, 0.32)	-0.36 (-1.05, 0.33)
Lockdown* Red Zone	-0.70 (-1.34, -0.05)	-0.63 (-1.42, 0.16)	-0.84 (-1.55, -0.14)
Constant	-0.54 (-2.92, 1.85)	-0.76 (-3.53, 2.01)	0.25 (-2.12, 2.63)
Observations	4,10,196	2,67,812	1,42,360
Number of households	68,655	44,279	24,373

The DiD results are reported with 95% confidence intervals.

Figure 1. Pre-trends for pre-lockdown months for red and orange zones for period products expenditure

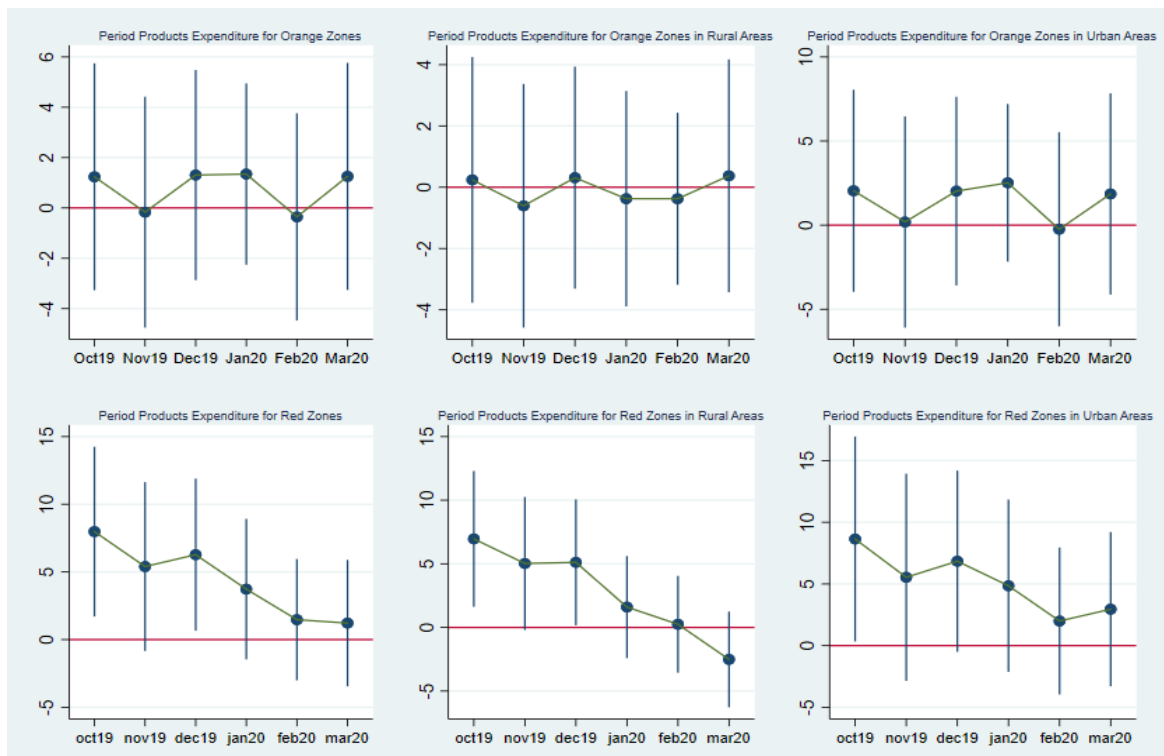
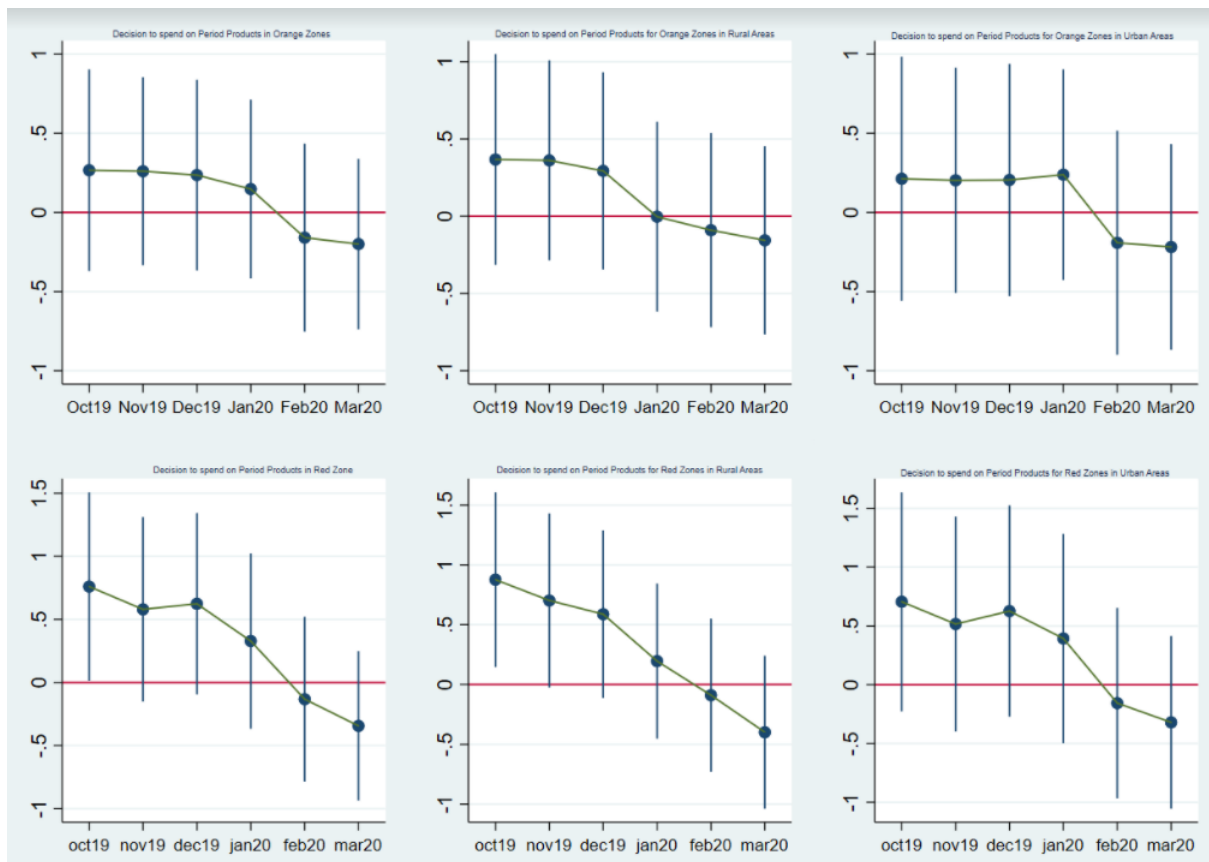


Figure 2. Pre-trends for pre-lockdown months for red and orange zones for decision to spend on period products



Online Appendix

A. Empirical Strategy for Robustness Checks

We conducted multiple robustness checks to the main analysis to confirm the effect of the lockdown containment policies on the period products consumption in India. First, we randomly re-match the zones to the districts to ensure that our estimates are not a result of spurious correlations in the data or any unobserved time-varying characteristics. We re-estimate the equation (1) with these randomly assigned districts. If α_1 , α_2 , and α_3 turn out to be null and insignificant, then we can say with greater confidence that the dip in the period products consumption is due to the zonal classifications.

Second, the number of people using period products in the pre-lockdown era may differ across the districts, which may be driving our results. To account for such cases, we have used the National Family Health Survey-4 and have calculated the mean number of women using the period products at the district levels. We use self-reported responses to the question on period product usage. The survey asked the question, “Women use different methods of protection during their menstrual period to prevent blood stains from becoming evident. What do you use for protection, if anything? Anything else?”. We average and aggregate individual-level responses across 247,833 women to the district level using the survey weights to obtain district-level period product usage estimates. We re-estimate the equation (1) and controlled for the number of women using period products at the district levels. We expect α_3 to remain significant, even after controlling for the mean number of women using period products in the pre-lockdown era, to confidently say that our results are driven due to the zonal classifications.

Third, we observed the trends for the other items to check its similarity with the period products. We re-estimated the equation (1) with the expenditure for various other items including intoxicants, bidis, alcohol, tobacco, and cosmetics. If α_1 , α_3 turn out to be null and insignificant, then we can say with greater confidence that the dip in the period products is due to the lower priority.

B. Results for Robustness Checks

First, Table C2 reports the results for the random assignment of the districts to various other zones. Our DID estimates shows that lockdown reduced the period product expenditure by 0.20 (95% CI=-1.34, -0.050; P=0.479). However, the results were statistically insignificant, and we found similar results in the urban and rural areas (see Table C3 for more info). Overall, the coefficients are small and statistically insignificant, which builds our confidence in showing that the results are driven by the lockdown policies and not a mere consequence of the spurious data.

Second, we re-estimate the equation (1) by accounting for the variations in the period products used across the 510 districts. Table C3 reports the results for the differential impact of the zones and lockdown on the period products usage while accounting for the district level means of the

period products usage. Our DID estimates shows that lockdown reduced the period product expenditure by Rs 5.31 (95% CI=-10.71, -0.09; P=0.054) across India. Similar results were found in the urban and rural areas. Our results remain robust and similar results were found even after accounting for the variations in the period products used across the districts.

Third, table C4 report the results for the differential impact of lockdown and zones on the expenditure of the various items including intoxicants, bidis, alcohol, tobacco and cosmetics. Our DID estimates shows that lockdown reduced the expenditure for all these items, however, there was no impact across zones.

C. Tables

Table C1. Descriptive Statistics of the household and menstruating variables used

Household Variables	Mean	SD
Size	5.11	2.75
Average age of all members	36.63	12.09
Years of Education	8.23	3.13
Employment Status	1.34	0.81
Bank Account	3.42	1.35
Mobile	2.06	1.17
Female Employment	0.15	0.40
Female with Bank Account	1.61	0.82
Female with Mobile Phone	0.76	0.75
Average Age of menstruating females	29.37	7.63
Menstruation Variables	Mean	SD
Years of Education of menstruating females	8.94	3.52
Employment Status of menstruating females	0.14	0.37
Bank Account of menstruating females	1.32	0.69
Mobile	0.60	0.62

Table C2. Differential Impact of the lockdown and zones on period product usage for the shuffled zones.

VARIABLES	(1) India	(2) Urban	(3) Rural
Orange Zone	0.013 (-0.21, 0.24)	-0.030 (-0.36, 0.29)	0.102 (-0.22, 0.42)
Red Zone	0.168 (-0.77, 0.41)	0.114 (-0.23, 0.46)	0.262 (-0.76, 0.60)
Lockdown	-5.90 (-8.50, -3.30)	-5.817 (-9.13, -2.50)	-6.060 (-8.46, -3.65)
Lockdown*Orange Zone	-0.328 (-0.92, 0.26)	-0.413 (-1.22, 0.40)	-0.107 (-0.96, 0.75)
Lockdown* Red Zone	-0.201 (-0.76, 0.35)	-0.027 (-0.76, 0.70)	-0.509 (-1.35, 0.33)
Constant	32.52 (18.33, 46.70)	45.59 (37.54, 53.64)	16.51 (5.68, 27.32)
Observations	417,248	271,915	145,333
Number of households	69,860	45,035	24,825

The DiD results are reported with 95% confidence intervals.

Table C3. Differential Impact of the lockdown and zones on Period Products after controlling for district-level mean period products usage.

VARIABLES	(1) India	(2) Urban	(3) Rural
Orange Zone	-1.18 (-4.72, 2.35)	-0.76 (-5.49, 3.96)	-1.92 (-5.65, 1.81)
Red Zone	2.53 (-2.54, 7.60)	3.28 (-3.14, 9.69)	-0.28 (-4.92, 4.36)
Lockdown	-3.60 (-7.47, 0.28)	-3.47 (-8.39, 1.44)	-3.84 (-7.07, -0.60)
Lockdown*Orange Zone	-1.56 (-5.77, 2.65)	-1.67 (-7.02, 3.67)	-1.40 (-4.97, 2.18)
Lockdown* Red Zone	-5.31 (-10.71, 0.09)	-5.12 (-12.18, 1.94)	-5.74 (-10.17, -1.30)
Constant	3.45 (-14.33, 21.23)	-8.622 (-12.18, 1.94)	33.67 (5.34, 61.99)
Observations	410,240	267,864	1,42,376
Number of households	68,662	44,287	24,375

The DiD results are reported with 95% confidence intervals.

Table C4. Differential impact of lockdown and zones on other products used by men and women in the households

VARIABLES	(1) Intoxicant	(2) Bidis	(3) Alcohol	(4) Tobacco	(5) Cosmetics
Orange Zone	102.63 (-45.91, 251.18)	-14.01 (-25.78, -2.23)	156.79 (17.74, 295.84)	-46.19 (-76.50, -15.87)	161.19 (54.35, 268.02)
Red Zone	149.79 (67.42, 232.15)	-22.23 (-29.66, -14.80)	141.29 (117.10, 165.48)	56.64 (17.61, 95.67)	-8.47 (-96.73, 79.78)
Lockdown	-134.47 (-173.68, -95.26)	-4.95 (-11.06, 1.14)	-97.87 (-129.44, -66.29)	-28.88 (-42.12, -15.64)	-97.91 (-128.70, -67.12)
Lockdown*Orange Zone	12.83 (-31.52, 57.18)	-1.41 (-9.67, 6.84)	15.57 (-19.96, 51.10)	2.79 (-13.82, 19.41)	-11.40 (-49.02, 26.22)
Lockdown* Red Zone	-9.44 (-67.49, 48.60)	-5.58 (-14.03, 2.87)	17.32 (-34.89, 69.52)	-5.68 (-23.77, 12.41)	-28.52 (-72.78, 15.73)
Constant	-97.01 (-182.51, -11.50)	5.73 (-8.64, 20.12)	-71.18 (-118.55, -23.80)	26.12 (-8.33, 60.58)	75.69 (-41.75, 193.14)
Observations	4,30,956	4,30,956	4,30,956	4,30,956	4,30,956
Number of households	72,093	72,093	72,093	72,093	72,093

The DiD results are reported with 95% confidence intervals.