

# To Pad or Not to Pad: Towards Better Sanitary Care for Slum Women in India<sup>1</sup>

Supriya Garikipati: Reader in International Development, University of Liverpool Management School, Liverpool L69 7ZH, UK; +44 (0)151 795 3008, [S.Garikipati@liverpool.ac.uk](mailto:S.Garikipati@liverpool.ac.uk) (corresponding author)

Camille Boudot: Research Manager, Center for Microfinance – IFMR LEAD, H. No. 10-2-164/A, Plot 37, Lane No. 4, Street no. 6, West Marredpally, Secunderabad- 500 026, Telangana, India; +91 9553694016, [camille.boudot@ifmr.ac.in](mailto:camille.boudot@ifmr.ac.in) / [c.boudotreddy@gmail.com](mailto:c.boudotreddy@gmail.com)

## Abstract

A number of programmes have recently been initiated to popularise the use of sanitary pads among poor women in developing countries. In this light, we review the prevailing menstrual practices in different contexts across India, as well as the initiatives undertaken to improve sanitary care. We also report findings from a study amongst women in slums of Hyderabad. We find high usage of sanitary pads (56% to 64%), suggesting that development initiatives have percolated down to the urban poor. Furthermore, we find that although a large number of cloth users (57%) are willing to change practice, an overwhelming number of them (94%) elicit a preference for re-usable cloth pads. This suggests a disengagement with public policy discourses on menstrual care that have so far focused singularly on promotion of sanitary pads. We draw upon these results to comment on better sanitary care for women slum dwellers in a rapidly urbanising context.

## 1 Introduction

This paper seeks to understand the status of menstrual hygiene services accessible to women living in Indian slums. It draws on survey data collected from women in three slums. The focus is on the recent public policy push in India that promotes the use of sanitary pad usage among poor women. Our study suggests that despite being successful in improving pad usage, the policy has ignored some critical aspects of sanitary care that need to be brought into focus for provision of sustainable sanitary services in slums.

Menstrual-hygiene is closely associated with gender equality and female empowerment through its direct influence on women's reproductive health, education and labour participation. This brings it to the forefront of international development concerns represented in the Millennium Development Goals (MDG 2, 3 and 5) as well as the more recent Sustainable Development Goals (SDG 5 and 6). The increased advocacy of this issue within the policy sector by international organisations (Ten, 2007) has been accompanied by a growing body of literature documenting the impact of poor menstrual hygiene management (MHM) on key development outcomes (Eijk *et al.*, 2016). A study by UNICEF on the link between sanitation and education in the context of developing countries, reports that 10% of school age girls in Africa do not attend class during their menstrual cycle (Kirk & Sommer, 2006). Addressing this concern, a field experiment in Ghana providing sanitary pads and a health education module to school girls, found that this program increased school attendance by 9%

---

<sup>1</sup> **Acknowledgements:** We are grateful to the Global Health Unit at the University of Liverpool, UK for financial support, and the Centre for Microfinance at IFMR-LEAD, India for all aspects of data collection. We thank Kislaya Gopal for her excellent research assistance and Rubina Nafees Fatima and her team at Safa for facilitating the fieldwork. This study received ethics approval from both University of Liverpool, UK and IFMR, India. We would also like to thank the two anonymous referees for very constructive reviews. The usual disclaimer applies.

(Dolan, Ryus, Dopson, Montgomery, & Scott, 2014). With respect to reproductive health of women, poor MHM has been associated with an increased risk of reproductive tract infections (Das *et al.*, 2015; House, Mahon, & Cavill, 2012; Ramaswamy, 2011). Furthermore, such health outcomes have repeatedly been shown to have considerable repercussions on the labour market, with a recent study by the Water Supply Sanitation Collaborative Council (WSSCC) in Bangladesh suggesting that an infection due to usage of cloth during menstruation leads to 73% of women missing work for an average of 6 days a month (WSSCC, 2013a). Addressing the problem of menstrual hygiene in developing countries is therefore critical to realising the relevant SDGs.

The initial response to these concerns of MHM amongst girls and women in low-income countries was to focus on providing access to sanitary pads either free of cost (such as the ‘Always! Keeping Girls in School’ campaign spearheaded by Procter and Gamble in partnership with UNICEF across various countries of Africa) or at a subsidised rate (such as the Menstrual Hygiene Scheme by the Indian Central Government). However, following growing criticism that urban planners in developing countries have so far entirely neglected the issue of MHM and its link to sanitation and waste management facilities (Bharadwaj & Patkar, 2004), there has been a shift in focus towards research and development dedicated to the production and social marketing of alternative products, as well as infrastructure design for disposal of sanitary waste (Ten, 2007). Innovation in this field includes reusable sanitary pads (such as AFRIPads in Uganda or Eco Femme in India), pads made from material which are easily compostable (such as pads made from agro-wastes in India by Akaar Innovation), as well as incinerators and latrines supplied with wells for decomposition of waste (such as those developed by UNICEF in India (Ten, 2007)).<sup>2</sup> The surge in policy response and innovation has been so fantastic that the efforts at collating the achievement so far and to understand what these mean for the most deprived sections of the society are yet to catch up.

In this rather underexplored space, this paper makes two main contributions. First, we attempt to consolidate knowledge on what has been achieved so far in terms of improving MHM in India. Second, with the help of primary data from urban slums, we attempt to understand the implications of these achievements for some of the most deprived communities in India.

Studies that examine the usage of menstrual hygiene products and health awareness surrounding menstruation across a range of different settings in India highlight two strong trends. First, both usage of sanitary pads and health awareness are much lower in rural areas when compared to urban India. Usage of sanitary pads has been reported to include between 50% to 90% of the studied population in urban areas (Barathalakshmi, Govindarajan, Ethirajan, & Felix, 2014; Thakre *et al.*, 2011) while it drops to 0% to 65% in rural areas (Kamath, Ghosh, Lena, & Chandrasekaran, 2013; Shah *et al.*, 2013). Second, usage of sanitary pads in urban slums is much lower than the average urban rates and similar to that of rural areas – 2.9% to 28% in Delhi slums and resettlement colonies (Baridalyne & Reddaiah, 2004; Garg, Sharma, & Sahay, 2001). These trends emphasise the extreme inequality in MHM amongst different populations and highlight the importance of targeting health, hygiene and sanitation programmes for the rural and urban poor.

Given that urban slums have some of the worse MHM indicators and face increasingly steep challenges with respect to growing waste disposal, we decided to investigate the state of menstrual hygiene in slums following a decade of MHM initiatives and market innovations in India. We chose two notified and one un-notified slum from the city of Hyderabad in Telangana. Notified slums are

---

<sup>2</sup> For more information on these organisations see their websites: For AfriPads see: <http://afripads.com/> (accessed on 26<sup>th</sup> November 2015), for Ecofemme see: <http://ecofemme.org/> (accessed on 26<sup>th</sup> November 2015), for Akaar Innovations see: <http://www.akaarinnovations.com/> (accessed on 26<sup>th</sup> November 2015)

recognised by the municipal authorities and so benefit from connection to the (open) sewage system and regular waste collection, whereas un-notified slums do not enjoy such facilities – they are typically a bunch of *kutcha*<sup>3</sup> huts thrown haphazardly together and generally home to migrant workers. Our sample included a total of 150 women and young adolescent girls across these three slum locations. Each respondent was administered a semi-structured questionnaire in order to obtain information on their current practices related to menstrual hygiene. Furthermore, women who reported using cloth rags during their menstrual cycle were asked additional questions related to potential constraints for not using sanitary pads. Our findings show that usage of sanitary pads amongst our sample population is quite high – on average 56% use only sanitary pads and 8% use both pads and cloth during their cycle. This is in sharp contrast to other studies conducted in urban slums of India, prior to MHM policy take-off, with rates of sanitary pad usage being reported as low as 2.8% for urban settlements in the country's capital city of Delhi (Garg *et al.*, 2001). This suggests that MHM programs pursued by the government have indeed percolated down to some of the poorest population in India. Furthermore, our results highlight a correlation between age and usage of pads, indicating that the only menstrual protection many young girls have ever used are sanitary pads and that pads are likely to become the choice of the vast majority in time without any further interventions. While these results are to be celebrated with respect to improving usage of safer sanitary care products amongst a large section of the population, it is important to consider women who have so far been excluded from public policy programs. We examine the main constraints faced by women currently using cloth as a form of protection during menstruation and find that while a large number of them (57%) are in fact willing to change their current practice, they (94%) report an overwhelming preference for re-usable cloth pads. This choice however, has so far excluded them from current programs advocating safer menstrual care which have focused solely on encouraging usage of sanitary pads. We explore this misalignment in preferences and policy discourse and suggest ways in which these challenges could be addressed.

The rest of the paper is organised as follows. Section 2 presents a review of the current status of menstrual hygiene in India alongside the recent policy initiatives. Section 3 presents the findings from a qualitative study conducted amongst slum dwellers of Hyderabad. Section 4 discusses each of three critical elements of any MHM initiative in light of our findings: *price*, *choice* and *disposability*. Finally, Section 5 presents some concluding remarks.

## **2 Status of Sanitary Care in India**

A recent report by Plan India indicates that only 12% of India's 355 million menstruating women use sanitary pads (Nielsen, 2010). Such abysmal findings have pushed sanitary care to the forefront of development debate in India and since the early 2000, it has gained tremendous significance both in terms of the research interest it has commanded and the influence on policy it has exerted. In this section, we review and summarise some of the cross-sectional studies undertaken pan-India across a range of different populations and settings, and contextualise the findings within the current policy sphere. A search for papers published in peer reviewed journals, written or translated into English, available in the public domain and including original primary research with a particular focus on MHM and use of menstrual absorbent products yielded a total of seventeen eligible academic studies.<sup>4</sup> A summary of these papers including, location, sample selection, data collection tools and proportion of sample using sanitary pads at the time of survey is presented in Table A in the Appendix. The

---

<sup>3</sup> Houses made from sheets of plastic, bamboo, thatch and other similar low-quality materials.

<sup>4</sup> For a more thorough review and meta-analysis of the recent literature on MHM, please refer to Eijk *et al.* (2016).

objective of this research was primarily to measure the current trends in sanitary pad usage across the country, and to understand the importance of local perceptions and attitudes towards menstruation as a potential constraint to improving MHM. This motivation is closely related to the ongoing MHM programs led by the Government of India, including specifically the Menstrual Hygiene Scheme which provides low-cost sanitary pads and health education to young adolescent girls in rural areas.

The main consistent pattern that can be discerned from the reviewed studies is a significant variation in usage of sanitary pads between urban and rural areas. While usage of sanitary pads is relatively high in urban areas, consistent between the southern and northern states – ranging from 90% in Tamil Nadu (Bharathalakshmi, Govindarajan, Ethirajan, & Felix, 2014) to 49.5% in Maharashtra (Thakre *et al.*, 2011), it is abysmally low in rural areas – with 0% reported usage in rural Gujarat (Shah *et al.*, 2013) to a maximum of 65% in rural Karnataka (Kamath *et al.*, 2013). Furthermore, usage of sanitary pads in urban slums is much lower than the average urban rates and is similar to that of rural usage – 2.9% to 28% in Delhi slums and resettlement colonies (Baridalyne & Reddaiah, 2004; Garg *et al.*, 2001). These findings suggest that while the overall rate of sanitary pad usage across India is quite low – an average of 37% across all studies, this is skewed due to the predominant usage of cloth concentrated in rural and urban slum settings. The findings from these studies primarily suggest that when planning interventions to improve MHM in India, rural areas and urban slums will require special emphasis.

We also find that when included in the study, knowledge and awareness of reproductive health follows a similar trend to usage – with women in urban areas being more aware of sanitary pads as a form of hygienic absorbent during menstruation. However, awareness is always significantly higher than usage – for instance 48.75% of girls in rural West Bengal knew of sanitary pads, while only 11.25% made use of them (Dasgupta & Sarkar, 2008). This suggests that while awareness is a concern, it is not necessarily a constraint to adoption.

Very few of the studies rigorously document factors that determine usage of sanitary pads, as well as constraints to adopting these over other methods of sanitary care such as cloth. Of the three studies that attempt to profile sanitary pad users, three indicators seem to be positively correlated with ‘good’ menstrual hygiene practices: socio-economic status, education, and exposure to advertisements on TV and radio (Omidvar & Begum, 2010; Patil, 2014; Sudeshna & Dasgupta, 2012). Furthermore of the two studies which incorporate constraints to adoption within their analysis, economic costs and disposability are the two issues which appear to limit the usage of sanitary pads (Kamath *et al.*, 2013; Thakre *et al.*, 2011). This suggests that within the rather limited academic literature; costs, awareness and disposability appear to be the driving factors for poor levels of pad usage in India.

Closely following the insight of these findings, policy initiatives aimed at improving MHM in India have so far focused predominantly on education and affordability. Specifically related to the educational factor is the Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (RGSEAG), which was launched in 200 selected districts across all the 35 States and Union territories of the country in 2011.<sup>5</sup> Along with a range of initiatives from providing food grains and micronutrient fortification to vocational skills training, the RGSEAG includes a nutrition and health education component covering personal hygiene and onset of puberty so as to increase reproductive and sexual health awareness.

---

<sup>5</sup> For more information on this scheme, refer to the website of the Ministry of Women and Child Development - <http://wcd.nic.in/> (accessed on 26<sup>th</sup> November 2015).

Focused more precisely on menstrual hygiene and the constraint of affordability, especially amongst poor rural households, the Government of India launched the Menstrual Hygiene Scheme (MHS) in 2005 as part of the National Rural Health Mission (NRHM).<sup>6</sup> It aims to cover 25% of India's adolescent girls (10-19 years) living in rural areas, corresponding to approximately 15 million girls, in 150 districts spread across 17 States of the country. This scheme includes two main initiatives: (i) increasing demand for sanitary pads via health education and outreach by Accredited Social Health Activists (ASHAs), and (ii) providing supply of low-cost pads. This was achieved by subsidizing local production by women from Self Help Groups (SHGs) to the tune of Rupees 1.50 per packet, bringing down the price of a pack of pads from Rupees 7.50 to Rupees 6 – which was deemed affordable. While this scheme is laid out to address all of the main concerns presented by the literature – that is, targeting rural populations and intervening on the constraints of education and price – evaluations on its performance have been disappointing. Feedback from the field has highlighted significant issues with implementation, thereby reducing the potential impact. In Kerala, an independent qualitative study amongst both scheme officials and beneficiaries found a lack of awareness on the scheme guidelines by program staff, irregular supply and reported poor quality of pads (Srinivasan, Nair, Sreejini, & Jyolsna, 2013). Similarly, a study in Haryana found the scheme had stopped as SHGs were unable to sustainably manufacture sanitary pads at the enforced procurement price of Rupees 7.50 per pack (Sinha & Singh, 2013). These findings highlight a critical concern for the sustainability of programs aiming to address the constraint of affordability.

Beyond the work of the Government there exist extensive initiatives from a range of Non-Governmental Organisations (NGOs) focused on menstrual hygiene management. The Water Supply and Sanitation Collaborative Council (WSSCC), as well as Water Aid have been primarily engaged in 'breaking the silence' around menstruation by leading large-scale awareness campaigns across the country. In 2012, the WSSCC organised a travelling carnival to impart knowledge on sanitation and hygiene in remote areas, reaching over 12,000 women and girls (WSSCC, 2013b). Addressing the problem of disposability, UNICEF has developed a low cost incinerator attached to girls' toilets for the disposal of napkins in schools. This model program is now being adopted and scaled up by the State Government of Tamil Nadu in 150 schools. Taking another approach to disposability, UNICEF has also been working in the State of Maharashtra to have girl's latrines supplied with special wells so as to compost sanitary waste (Ten, 2007). Experimenting with different sanitary care products is also gaining momentum. Smaller local NGOs and start-ups such as Goonj have been working towards producing re-usable cloth sanitary pads and Akaar Innovations have developed a compostable sanitary pad using agro-wastes. Jayashree Industries, a small enterprise (SME) based in Coimbatore, Tamil Nadu, has developed a low-cost sanitary pad making machine which can be used by SHGs for the manufacturing of disposable pads for less than a third of the cost of commercial pads (Venemae, 2014).<sup>7</sup> While these initiatives are enabling the country to address some of the key constraints to improving menstrual hygiene, evidence supporting the influence on adoption of sanitary pads and impact on women's daily lives is currently lacking from the academic literature and policy reports.

### **3 A Study on Sanitary Practices in Urban Slums**

What do these policy initiatives and innovations mean for women living in some of the most deprived communities in India? Academic studies on MHM in India have focused primarily on sanitary

---

<sup>6</sup> For more information on this scheme, refer to the website of the National Rural Health Mission - <http://nrhm.gov.in/> (accessed on 26<sup>th</sup> November 2015)

<sup>7</sup> For more information on these organisations see their websites. For Goonj see: <http://goonj.org/> (accessed on 26<sup>th</sup> November 2015), for Jaysashree Industries see: <http://newinventions.in/> (accessed on 26<sup>th</sup> November 2015)

practices amongst young adolescent girls in rural and/or urban secondary schools. As mentioned previously, this is largely a reflection of the policy intent from the Indian Government with both the RGSEAG and MHS targeting education and supply of low-cost pads to young adolescent girls. While this is clearly an important group to target, especially in rural areas given the low rates of sanitary pad usage reflected in the literature, it is also important to consider the case of yet another vulnerable populace – young girls and women living in urban slums. In some respects these women are the most vulnerable from the viewpoint of adopting good menstrual practices: poverty, lack of awareness, spatial and infrastructural constraints may all combine to pose an insurmountable challenge. In this section, we present results from a study that was conducted amongst slum dwellers in order to better understand their current sanitary practices, including constraints faced to adoption of sanitary pads.

#### *i. Research Methods*

We undertook this study in partnership with *Safa* - a grassroots social venture. *Safa* works with women in slums of Hyderabad, India, focusing on education and income generation activities as they believe these to be the ultimate drivers of empowerment. *Safa* provides its women members with livelihood trainings such as tailoring and embroidery, as well as entrepreneurship opportunities through the sales of its members' handmade products including bags, soft toys, carpets and others.<sup>8</sup> In view of diversifying their income generation opportunities, *Safa* initiated the 'Kiran Group' in 2012 with the aim of engaging a small group of women members in door-to-door sales of household products within their slum community. One of the products marketed under this program was sanitary pads. In 2014, at the start of this study, the Kiran Group consisted of 9 members, selling sanitary care products to approximately 200 regular clients in one slum locality. *Safa* was looking to expand this activity across to other slum locations and agreed to partner in this study as a way of understanding the pad's market better and gain an insight into the sustainability of their initiative. *Safa* was instrumental in providing access to the women interviewed as part of this study.

This study was carried out across three different slum locations in Hyderabad, India. These slums were sampled so as to be inclusive of *Safa*'s working area but excluded the locality where the Kiran Group was already selling sanitary pads. Two of the slums surveyed were categorised as 'notified', while the third was not a notified slum. Notified slums are areas registered as slums by their municipalities under the 'Slum Act', wherein habitants generally have land-ownership of the tenements as well as some basic infrastructural facilities including lanes, electricity, sewage, water supply and waste collection. On the other hand, slums that are un-notified (officially referred to as 'identified' slums in the Census documents) are defined as compact areas of at least 300 people or 60-70 households of poorly built congested tenements with inadequate infrastructure and lack of sanitary and drinking water facilities. Un-notified slums therefore tend to be transitory, with the possibility of eviction, and generally home to migrant groups such as daily wage workers. Sampling across both types of slums was important to get a representational view of sanitary practices across urban slums with residents from a range of populations across the socio-economic spectrum – un-notified slums being at the lowest end of this hierarchy.

A total of 150 women and young adolescent girls, proportionately sampled across the three slum locations, were interviewed during this study. In order to have a representative sample of the population, we adopted a simple random sampling methodology. This methodology involved starting from a random location in the slum and approaching every 5<sup>th</sup> house along the street for participation in the survey. Our only criterion for participation in the study was that the woman/young girl had to

---

<sup>8</sup> For more information on *Safa* see their website - <http://www.safaindia.org/> (accessed on 26<sup>th</sup> November 2015)

be of menstrual age, identified as 15 to 49 years.<sup>9</sup> Refusal to engage in the study was relatively high, with approximately 34% rejections. This refusal was generally consistent across all slum locations and mainly came from women who felt the topic was “too embarrassing” to talk about (see Table B in the Appendix for more details). Given this refusal rate, we continued to sample using the original strategy until we achieved a final sample of 150 women and girls who consented to participate.

Our initial approach to data collection was to conduct focus group discussions with 5 to 7 respondents, in order to promote informal discussions especially on the topic of constraints to adoption of sanitary pads. This method however proved very difficult to implement due to the highly limited mobility of women and sense of social taboo surrounding the topic which precluded its discussion in groups. Since we believed mobility to be potentially correlated with indicators of sanitary pad usage, such as female empowerment and financial autonomy, we felt that using this method would lead to a selection bias in our sample and therefore decided to switch to individual semi-structured interviews. Each respondent was administered a questionnaire with specific sections on menstrual hygiene practices, influence of menstruation on daily activities, perceived benefits of sanitary pads as improved hygiene, and constraints to adoption of menstrual sanitary products. The majority of questions were categorical so as to obtain specific and consistent information across the sample, with some open-ended questions to encourage discussion with the respondents and encompass additional information on the topic. All interviews were conducted by women enumerators, recruited and trained by us, alongside a member of *Safa* so as to facilitate trust and ease of discussion on such personal information.

Additional to the individual questionnaire, we also conducted a short market survey of shops in the three sampled slum locations. This involved sampling three shops, from a mix of medical and general stores, along the main market road and within walking distance from the sampled households. A list of all sanitary pad products, their specific features and prices were recorded. The objective of this survey was to test for convenience of availability of sanitary pads to women in our sample.

## *ii. Results*

### *a. Sample Characteristics and Determinants of Pad Usage*

One of the key results to emphasise from this study is simply the high rate of usage of sanitary pads amongst our sample – 56% of respondents report only using pads and 8% report using a combination of pad and cloth while just around 36% reported using only cloth as menstrual protection (see Figure 1). This is in sharp contrast to the findings of other studies conducted in urban slums which report low rates of sanitary pad usage – for instance Baridalyne & Reddaiah (2004) report the rate as 2.9% for resettlement colonies in Delhi and Garg, Sharma & Sahay (2001) report it as 28% for urban slums also in Delhi. The high rates of sanitary pad usage amongst our respondents may suggest that initiatives promoting MHM in India over the last five years have reached even the poorest and most vulnerable of urban populations. These results should also be used to place in perspective the findings reported by the Nielsen (2010), which has so far been the benchmark for rates of sanitary pad usage in India. Nielsen’s report claims that only 12% of women across India use pads, whereas we find that majority of women in urban slums - arguably the most socio-economically deprived women in the country - use sanitary pads. This suggests that either Nielsen’s study is driven by sampling across

---

<sup>9</sup> While girls tend to menstruate at much earlier age than 15 years, we restricted our sampling to this age group due to ethical concerns surrounding inclusion of younger girls in the study. Inclusion of younger girls was also likely to add very marginally to our understanding of issues surrounding menstrual hygiene.

large rural populations where adoption of sanitary pads is potentially still very low and therefore highlights the importance of contextualising statistical trends, or plausibly that MHM initiatives and market expansion have percolated down to the most deprived communities in urban India at an unprecedented rate. In either case, our results categorically show that urban slums are moving out of low levels of sanitary pad usage and that Nielsen's report no longer reflects ground realities.

<Figure 1 here>

Our results suggest that 36% of women in our sample continue to report using cloth as menstrual protection. In order to be able to effectively promote improved MHM practices among these women, it is critical to understand their profile and identify potential characteristics which determine the usage of cloth over pads. To approach this question, we compare the means of various socio-economic characteristics at the individual and household level between pad users and cloth users. The t-tests which compare the differences between the means of these characteristics across the two groups are presented in Table 1. Our results suggest that younger women with somewhat better socio-economic statuses are least likely to be using cloth.

Unlike most other MHM studies we did not limit our respondents to adolescent girls, but rather included nearly all women and young girls of menstrual age – 15 to 49 years. This allows us to decipher an important difference between pad and cloth users. Our findings suggest that those using pads are on average 5 years younger than cloth users, with this difference being statistically significant at the 1% level. In fact, we find that of the respondents using pads, 42% of them started at the time of puberty and have never used any other product. This clearly suggests that a significant proportion of young girls entering menarche are directly adopting sanitary pads. As such, it is feasible to assume that over time pads are likely to become the majority choice without any further form of intervention.

Socio-economic status also appears to be an important indicator for usage of cloth, indicated by results on both the respondent's and her husband's/father's employment status. We use employment status as an indicative proxy for socio-economic strata, as the economic condition of slum dwellers is closely linked to both employment activity and emblematic of a social standing that is deeply embedded in their psyche. Based on their reported employment activity, we were able to categorise individuals as 'daily labourers' with low and uncertain incomes associated to unskilled work or as 'salaried' with either predictable earnings or self-employed skilled work, or in some cases as 'not working' for those in school or women who have withdrawn from the labour market (or never participated) as others in the household are employed. We limit our analysis to a comparison of daily labourers with those that are salaried, in order to capture active employment. We find that on average for those women engaged in the labour market - daily labourers are on average 20% more likely to be using cloth, with the difference being statistically significant at the 1% level. Similarly, working husbands/fathers of cloth users were 10% more likely to be engaged in daily waged labouring. This suggests that the poorer representative segment of our study, represented here as daily labourers due to their unskilled and low paid work, is more likely to be using cloth probably driven by an affordability constraint. As one woman described, '*Money is a problem. It's better to buy items for the children than to buy pads*'. Omidvar & Begum (2010), in one of the few studies documenting the profile of respondents linked to 'good' MHM practices, also find that socio-economic status is a significant factor in determining better sanitary practices including usage of sanitary pads. However, our results on the willingness-to-pay (WTP) for pads (see Table 3) by current cloth users, suggests that this liquidity limitation is not unsurmountable. The average reported WTP is approximately



Rupees 20, which is in fact only 2 rupees less than the lowest price recorded for sanitary pad products from the market survey (see Table C in the Appendix).

<Table 1 here>

This study enables us to identify whether women living in un-notified slums are more vulnerable to poor MHM practices as the sanitary provision in these slums is markedly worse than notified slums. Our results indicate that there is in fact little to differentiate between MHM habits of women living in notified and un-notified slums. Both types of slums report very similar levels of pad and cloth usage; with 58% and 55% of respondents reporting using pads in un-notified and notified slums respectively. A potentially more interesting household characteristic that may help profile target beneficiaries of MHM programs could be toilet and water infrastructure, as our results suggest that despite the difference not being statistically significant women using cloth are less likely to have access to private toilets and water facilities. Access to toilet is likely to be suggestive of the respondent's socio-economic background than any real link between access to sanitation facilities and cloth usage. In this sense, this result supports our earlier observation on correlation between socio-economic status and cloth usage.

#### *b. Influence of Sanitary Care Practices*

Evidence suggests that poor MHM practices have significant negative impact on girls' attendance in school (Dolan et al., 2014; Kirk & Sommer, 2006) as well as women's health (House et al., 2012; Ramaswamy, 2011) and labour activities (WSSCC, 2013b). Results in Table 2 report the t-tests which compare the differences between the means of our indicators on health, education and labour, for the two groups of women using different sanitary care practices – pads and cloth. Despite the difference not being statistically significant, we find that women using cloth are on average 5% more likely to have visited a doctor due to reproductive tract infections (RTIs) in the past. We can expect this to be linked to practices associated with using cloth, including drying and changing of cloth between cycles, which are thought to significantly increase the risk of RTIs (Ramaswamy, 2011; WSSCC, 2013b). In fact amongst our sample of cloth users up to 29% of them reported not drying the used cloth due to beliefs tied with menstrual blood, including witchcraft that may affect fertility. Furthermore, despite the majority of women using the same cloths for an average of two cycles, we find that 26% of women reported using the same cloths for over 6 months. These results are consistent with other studies analysing practices amongst cloth users in India (Dasgupta & Sarkar, 2008; Katkuri, Pravinpisudde, & Hasan, 2014). Our findings however, do not seem to suggest a significant influence on days missed of work or school/college.

We do find however, that a large proportion of our sample experiences reduced mobility during the period of menstruation. On average between 26-31% of women in our sample report restrictions on mobility such as having to remain indoors during their menstrual cycle. This is largely due to the presence of traditional belief surrounding menstruation. Women reported a range of constraints on their day to day activities, including washing, eating and behaviour with other family members. As one woman explained, *'I must only wash my hair on the 3<sup>rd</sup> and 5<sup>th</sup> day following the onset of bleeding, I cannot eat or touch any milk products, and must avoid making eye contact with men'*. When asked whether these restrictions were of their own choosing, 54% suggested they were in fact imposed on them by family elders due to beliefs held about menstrual blood. A number of MHM programs focus on menstrual hygiene education, but nearly all of them solely target adolescent girls. Our results indicate that addressing the taboos held by elders is equally important to positively impact the lives of young girls.

<Table 2 here>

### *c. Constraints to Changing Practices*

Despite the potential negative influence that poor MHM can have on women's life, changing behaviour and habit are not necessarily straightforward. To enquire into this issue, especially in relation with *Safa's* Kiran Group door-to-door sales, we asked questions related to the respondents willingness to change from their current practice and preferences of sanitary products. As can be seen in Figure 1, 57% of women using cloth were willing to consider changing habits. Interestingly, when these women were asked to report their non-exclusive preferences of sanitary care products, such that respondents were able to choose multiple options, only 52% reported a preference for disposable pads while 94% opted for re-usable cloth pads. None of the sample chose other alternatives such as moon cups and tampons, perhaps because these are considerably less well-known and unpopular options in India as they involve insertion. In this section, we consider the constraints to changing practice for each group of women – those wanting to switch to sanitary pads, those preferring re-usable cloth pads and those unwilling to change practice altogether.

We first consider the case of women using cloth that would be willing to switch to using sanitary pads. Despite the small sample size, results in Table 3 highlight the leading factor as financial constraints with an overwhelming 81% of the sample citing this as a reason for not adopting sanitary pads. For women in this group, the average willingness-to-pay for a packet of 7 pads is approximately Rupees 20. This corroborates our findings on the correlation between the usage of cloth and socio-economic status, indicating that poorer women are more likely to be using cloth due to issues for affordability. Encouragingly however, we find that the WTP is not far from the lowest price recorded during the market survey – Rupees 22 for a branded pack of 7 pads. This suggests that schemes that subsidise the market price of sanitary pads should be able to have a significant impact on adoption. These results are especially insightful for the MHS, the nation's pad subsidising scheme, which sells a packet of 6 pads for only Rupees 6, but suffers from problems of sustainability and product quality at such a low price (Sinha & Singh, 2013; Srinivasan *et al.*, 2013). Our findings suggest that this scheme could benefit from increasing their selling price to over three times the existing price and still have an impact on adoption, while improving their product quality and ensuring the viability and sustainability of the production units. With this pricing scheme, MHS is likely to support itself without relying on public subsidy, suggesting that improved menstrual hygiene is potential 'action ground' for private social enterprises like *Safa*.

The second most reported constraint to adoption is disposability. The problem of disposal is in fact closely linked to traditional beliefs. There is much superstition surrounding the discarding of menstrual blood. Women believe that unless buried or burned, the menstrual blood can be used in witchcraft and lead to infertility and blindness. This belief has been widely reported in studies across both North and South India (Bharathalakshmi *et al.*, 2014; A. Singh, 2006). In fact, half of the women willing to change practice still held some traditional beliefs surrounding the usage of pads, such as pads causing fever and infertility - mainly associated with the problem of disposing of the menstrual waste along with other material in relatively open view. According to one woman, *'The elders say that if a snake smells or slithers on a used pad, then it will become impossible for a woman to conceive'*. These findings suggest that installing disposal facilities, such as incinerators or specially designed latrines for decomposition of waste, can address both the issue of how to manage increasing sanitary waste, but also satisfy the traditional belief that women hold about menstrual blood which stops them from adopting pads. Furthermore, these results continue to emphasise the very low levels

of awareness on MHM and the need to intervene on education so as to reduce the influence of traditional myths surrounding a physiological phenomenon.

<Table 3 here>

Accessibility to sanitary products is often quoted as a significant constraint to adoption (WSSCC, 2013b). Given the fact that we faced significant challenges in implementing focus group discussions due to the limited mobility of women in the area, and that *Safa* was interested in promoting door-to-door sales of sanitary products, we enquired specifically on the issues of accessibility. Our results show however, that this is not a concern in urban slums. The very large majority (94%) of women reported having a nearby shop selling sanitary pads, and most of them (81%) faced no constraint on their personal mobility to access the shops. Furthermore, results from our market survey reiterated these findings. While availability of the cheapest product was somewhat limited (just 2 of the 9 shops stocked this), all medical and general stores sampled stocked at least two types of sanitary pads, with a range of 1 to 6 different brands (for more information on these results, see Table C in the Appendix). This suggests that promoting door-to-door sales alone may not sway preferences in favour of sanitary pads. To be successful such marketing strategies must be combined with other more critical aspects to the women such as at a price that is partially below the market rate. Our results suggest that this price must be around 10% below the lowest reported market rate (average WTP reported is around Rupees 20 whereas the cheapest available product on the market is Rupees 22).

While 52% of women reported a willingness to move to sanitary pads, Figure 1 shows that nearly all women wanting to change practice – 94% – would have preferred switching to re-usable cloth pads. According to one of the women interviewed, *‘I used pads once, but I didn’t find it comfortable.’*, while another respondent explained her preference for re-usable cloth pads due to convenience of habit, *‘I don’t know how to use pads, once I tried and it leaked. Re-usable cloth will be easier for me to use.’* These results concur with Shah *et al.* (2013) in Gujarat which tests the adoption and experience of adolescent girls using old cloth, a new soft cloth (falafin), and sanitary pads. The authors find that while 90% of girls in their sample were using old cloth at baseline, 68% of them reported falafin and only 32% reported sanitary pads as their preferred choice of product once these had been introduced to them. These findings reported from Shah *et al.* (2013) when combined with our survey data highlight a key result – the majority of women using cloth as protection during menstruation are unsatisfied with this current practice, but are also unwilling to change to using pads. By focusing on sanitary pads, the public policy initiatives of the past decade have excluded a significant proportion of women wanting an improvement in their MHM but without adopting commercially oriented sanitary pads. Policy experiments that use social marketing to promote alternative products like re-usable cloth pads are therefore essential to be inclusive of this last mile client to safer menstrual practices.

While our results encouragingly demonstrate that 57% of cloth users are willing to consider changing from their current sanitary practices, this nevertheless does leave a significant 43% of cloth users who reject the option of change. Habit, was reported by 95% of these women as the predominant reason for which they are not willing to change from their current practice. Considering that the majority of women in this group (78%) are aged between 25 to 40 years, which means that have been using cloth for around 10 years or more already – changing habit is very costly for them, and as such they are unwilling to invest time in changing practice. Policy initiatives aimed at this group of women should be targeted at improving awareness around good MHM practices when using cloth. It would also be interesting to see whether these women are more agreeable to changing practice if more affordable and sustainable alternatives to sanitary pads became a real option.

#### 4 Towards Improving Sanitary Care for ‘ALL’ Women Living in Urban Slums: A Discussion

Menstrual hygiene management interventions have so far focused on encouraging women to adopt sanitary pads as the preferred method of sanitary care. This has mainly been driven by government schemes on awareness building and subsidising of sanitary pads. Our results suggest that this policy push along with market forces has by and large been successful, with 56% to 64% of women in our sample making use of sanitary pads, especially young girls entering menarche who adopt pads straightaway. However, our findings also suggest that for MHM interventions to include the last mile client, these programs can no longer afford such a narrow focus. Our results show that at least three groups of women have been excluded from current MHM interventions: women who are willing to change to sanitary pads but cannot afford commercial prices, women who are willing to change only to some form of re-usable cloth pads, and those who are unwilling to change practice. Each group of ‘excluded women’ faces a unique set of challenges to adopting safer practices. We argue that to be inclusive of women across the preference spectrum, future MHM interventions must consider three core factors: Price, Choice and Disability. We discuss each of these issues in turn.

*Price:* Our results show that 52% of women willing to change from cloth to sanitary pads have not made this change mainly due to financial reasons. However, we also find that the average willingness to pay for a pack of pads for this group of women is around Rupees 20, just 10% below the lowest recorded market price. This finding provides an important perspective into the appropriateness of the current policies aimed at improving MHM. Pad subsidising schemes such as that of the MHS administered by the Indian Government, providing both education and low-cost sanitary pads to adolescent girls in rural areas, is clearly targeting the main constraints faced by women wanting to switch to pads. However, this scheme is burdened with problems of sustainability of their production units and poor product quality. Our results suggest that women are in fact willing to pay over three times the price set by MHS. The objective of the current subsidy seems to be to provide a low quality product at the cheapest possible price. This is unlikely to have a positive impact on adoption and usage of sanitary pads. For the majority of women in our sample who have made the move from cloth to pads, ‘comfort’ is reported as the main motivator for continued use of pads. Taken together our results suggest that while price matters, quality of the product is also critical for women to continue usage. Quality at the right price seems to be the clenching mantra for women who want to switch to pads but currently find this an expensive alternative. There is already a good amount of innovative work in the private sector that targets this group of women. For instance, *Jayashree* Industries in Tamil Nadu, develops technology used in small-scale production of quality sanitary pads at prices significantly below the market price. Interestingly, their market model suggests a retail price of 2.75 rupees per pad<sup>10</sup> – which would coincide with our findings on average WTP among women who are willing to switch to pads. Our results suggest that there is likely to be an effective market for such innovations that experiment with producing quality pads markedly lower than commercial pads.

*Choice:* One of unique results of this study, especially in view of including the last mile clients, is the importance of providing women with a choice of menstrual protection methods. In our sample, critically, 94% of women who were willing to change from using cloth report a preference for re-usable cloth pads. This points to a missing link in the public policy discourse over menstrual hygiene

---

<sup>10</sup> According to their market model, the machines can be used to manufacture a packet of 8 pads for Rupees 22 including a significant profit margin so as to allow the small enterprise to grow sustainably. The founder of Jayashree Industries – Mr. Muruganatham – has received worldwide praise for his work and has installed over 1300 across 27 States of India.

in the context of developing countries that, despite the availability of better and largely affordable alternatives, women may prefer to retain a range of choice when it comes to menstrual protection. We find that a large proportion of women willing to adopt safer practices – but unwilling to use disposable sanitary pads – are being abandoned by the current policy initiatives that have systematically focused on the provision of sanitary pads alone. This consistent exclusion of women to improved MHM emphasises the importance of offering alternative products, such as re-usable cloth pads. These products provide more hygienic conditions to women during menstruation and are more convenient to use. Results from a study in Gujarat by Shah *et al.* (2013) on reusable falafin cloth pads reiterate these observations. A number of small initiatives have also started to take this route, such as EcoFemme in India and AfriPads in Uganda. An evaluation by Croft and Fisher (2012) of AfriPads re-usable pads suggested that there was demand for such products, which were perceived as a middle road between free unhygienic rags and expensive branded pads. However, such programs lack some credibility due to the absence of scientific evidence of their impact on women's health in comparison to cloth rags, especially with respect to RTIs. Further research and innovation is therefore required in this field, which could provide a leading pathway to including most women wanting improved MHM.

*Disposability:* The issue of disposability emerges on every front of our study. In our sample, 13% of women wanting to switch to sanitary pads do not do so due to associated problems of disposing publicly of menstrual blood. Similarly, retaining customs surrounding disposability also arises as a positive feature of re-usable cloth pads, for those unwilling to adopt disposable sanitary pads. Furthermore, after decades of being entirely ignored both within MHM specific programs, as well as general water and sanitation interventions (Bharadwaj & Patkar, 2004), the concern of increasing waste disposal in urban slums, has been generating a national dilemma. While there is no official data on menstrual waste in India, Down to Earth magazine using the Nielsen Report (2010) as a benchmark for usage of sanitary pads across India (estimated to be at 12%) estimated the associated waste to be around 432 million soiled pads a month, weighing up to 9,000 tonnes which would be enough to cover a landfill of 24 hectares (Basu, 2013). This would require an area equal to more than six times the size of Vatican City every year. Given our results on the rate of sanitary pad usage in slums and amongst young girls entering menarche, this is likely to be an underestimate and amplifies growing concern on how to manage this waste. Acknowledging the issue of sanitary waste disposal, the Indian Government is promoting the incineration of menstrual waste and funding a project for the construction of low-cost incinerators in schools of Tamil Nadu. However incineration is met with extensive criticism, including the environmental impact from the release of toxins and the financial sustainability of such programs. In view of such critiques, further research and development into potential innovations is ongoing, including work by UNICEF on specially designed latrines for decomposition of waste (Ten, 2007). A more attainable option, at least in the short term, addressing both the issue of disposability as well as waste management for more sustainable and resilient cities, once again leads us to re-usable sanitary products.

## **5 Concluding remarks**

A review of academic research in the field of MHM across India, suggests that both sanitary pad usage and awareness of improved MHM practices can be abysmally low in both rural and urban slum settings, while showing near 100% adoption in pockets of urban populations. Our study however, highlights that with the surge of MHM programs across the country by both government schemes and NGOs initiatives – focused largely on raising awareness and providing low cost sanitary pads, sanitary pad usage is on the rise in urban slums. According to our results, 56% to 64% of our sample

use sanitary pads, with the majority of girls entering menarche directly adopting disposable sanitary pads as their preferred choice. These encouraging rates are to be celebrated as evidence that the policy push has been successful in including the upcoming generation of women from vulnerable section of the population into improved MHM. Our study however, also highlights the fact that MHM interventions have excluded a substantial segment of these women by their singular focus on sanitary pad adoption. Our results show that 36% of women in our sample are still currently using rags as protection during menstruation, but that a large majority of them are willing to change. Interestingly, while 52% of these women report willingness to shift to sanitary pads, an overwhelming 94% cite reusable cloth pads as their preferred choice. This highlights a glaring omission in the past decade's MHM initiatives that have focused exclusively on disposable sanitary pads. The current MHM programmes fail to serve these women by ignoring issues that are at the core of their preferred menstrual practices. In addition to this, we find that given the growth in demand for disposable sanitary pads there is a growing concern for sustainability of waste management schemes in urban slums. In a country as large as India and urbanising at an unprecedented rate – menstrual hygiene policy that singularly focuses on disposable sanitary pads is insupportable. The insights from our findings suggest that for future MHM interventions to be inclusive and at the same time to ensure more resilient cities, they must pay attention not only to price, but also to disposability and ultimately aim to improve the choice of menstrual protection alternatives available to women.

## Bibliography

- Barathalakshmi, J., Govindarajan, P., Ethirajan, N., & John William Felix, A. (2014). Knowledge and Practice of Menstrual Hygiene among School Going Adolescent Girls. *National Journal of Research in Community Medecine*, 3(2), 138–142.
- Baridalyne, N., & Reddaiah, V. (2004). Menstruation knowledge, beliefs and practices of women in the reproductive age group residing in an urban resettlement colony of Delhi. *Health and Population: Perspectives and Issues*, 27(1), 9–16.
- Basu, S. (2013). Kicking up a stink. *Down to Earth*.
- Bharadwaj, S., & Patkar, A. (2004). Menstrual hygiene and management in developing countries: Taking stock. *Junction Social - Social Development Consultants*.
- Bharathalakshmi, J., Govindarajan, P., Ethirajan, N., & Felix, A. (2014). Knowledge and practice of menstrual hygiene among school going adolescent girls. *National Journal of Research in Community Medicine*, 3(2), 138–142.
- Crofts, T., & Fisher, J. (2012). Menstrual hygiene in Ugandan schools: an investigation of low-cost sanitary pads. *Journal of water, sanitation and hygiene for development*, 2(1), 50–58.
- Das, P., Baker, K. K., Dutta, A., Swain, T., Sahoo, S., Das, B. S., Panda, B., et al. (2015). Menstrual hygiene practices, WASH access and the risk of urogenital infection in women from Odisha, India. *PloS one*, 10(6), e0130777.
- Dasgupta, A., & Sarkar, M. (2008). Menstrual hygiene: How hygienic is the adolescent girl? *Indian Journal of Community Medicine*, 33(2), 77.
- Dhingra, R., Kumar, A., Kour, M., & others. (2009). Knowledge and practices related to menstruation among tribal (Gujjar) adolescent girls. *Studies on Ethno-Medicine*, 3(1), 43–48.
- Dolan, C., Ryus, C., Dopson, S., Montgomery, P., & Scott, L. (2014). A blind spot in girl's education: Menarche and its web of exclusion in Ghana. *Journal of International Development*, 26(5), 643–657.
- Eijk, A. M. van, Sivakami, M., Thakkar, M. B., Bauman, A., Laserson, K. F., Coates, S., & Phillips-Howard, P. A. (2016). Menstrual hygiene management among adolescent girls in India: A systematic review and meta-analysis. *BMJ open*, 6(3), e010290.
- Garg, S., Sharma, N., & Sahay, R. (2001). Socio-cultural aspects of menstruation in an urban slum in Delhi, India. *Reproductive Health Matters*, 9(17), 16–25.
- House, S., Mahon, T., & Cavill, D. (2012). Menstrual hygiene matters. *Sustainable Sanitation and Water Management*.
- Juyal, R., Kandpal, S., Semwal, J., & Negi, K. (2012). Practices of menstrual hygiene among adolescent girls in a district of Uttarakhand. *Indian Journal of Community Health*, 24(2), 124–128.
- Kamaljit, K., Arora, B., Singh, K., & Neki, N. (2012). Social beliefs and practices associated with menstrual hygiene among adolescent girls of Amritsar, Punjab, India. *JIMSA*, 25(2), 69–70.
- Kamath, R., Ghosh, D., Lena, A., & Chandrasekaran, V. (2013). A study on knowledge and practices regarding menstrual hygiene among rural and urban adolescent girls in Udipi Taluk, Manipal, India. *Global Journal of Medicine and Public Health*, 4(2), 1–9.
- Katkuri, S., Pravinpisudde, N., & Hasan, S. (2014). A study to assess knowledge, attitude and practices about menstrual hygiene among school going adolescent girl's in Hyderabad, India. *Journal of Pharmaceutical and Biomedical Sciences*, 4(4), 298–302.
- Kirk, J., & Sommer, M. (2006). Menstruation and body awareness: linking girls' health with girls' education. *Royal Tropical Institute, Special on Gender and Health*, 1–22.
- Mudey, A., Kesharwani, N., Mudey, G., & Goyal, R. (2010). A cross-sectional study on awareness regarding safe and hygienic practices amongst school going adolescent girls in rural area of Wardha District, India. *Global Journal of Health Science*, 2(2), 225–231.
- Nielsen, A. (2010). Sanitary Protection: Every Woman's Health Right. *AC Nielsen Report*.
- Omidvar, S., & Begum, K. (2010). Factors influencing hygienic practices during menses among girls from south India-A cross sectional study. *International Journal of Collaborative Research on Internal Medicine & Public Health*, 2(12), 411–423.

- Patil, S. R. (2014). Knowledge and practices of menstrual hygiene among married adolescents and young women in Chittoor district of Andhra Pradesh: India. *Journal of Nursing and Health Science*, 3(2), 6–15.
- Ramaswamy, D. (2011). Relation between poor menstrual practices and cervical cancer. *Indian Institute of Biotechnology*.
- Salve, S., Dase, R., Mahajan, S., & Adchitre, S. (2012). Assessment of knowledge and practices about menstrual hygiene amongst rural and urban adolescent girls - A comparative study. *International Journal of Recent Trends in Science And Technology*, 3(3), 65–70.
- Shah, S., Nair, R., Shah, P., Modi, D., Desai, S., & Desai, L. (2013). Improving quality of life with new menstrual hygiene practices among adolescent tribal girls in rural Gujarat, India. *Reproductive Health Matters*, 21(41), 205–213.
- Singh, A. (2006). Place of menstruation in the reproductive lives of women of rural North India. *Indian Journal of Community Medicine*, 31(1), 10–14.
- Singh, S., Kandpal, S., & Roy, D. (2011). Menstrual hygiene practices and RTI among ever-married women in rural slum. *Indian Journal of Community Health*, 22(2, 1), 41–43.
- Sinha, S., & Singh, A. (2013). Adolescent health tackling menstrual hygiene issue through social marketing of sanitary napkins scheme: An evaluation study from Haryana. *Journal of Postgraduate Medicine, Education and Research*, 47(3), 127–130.
- Srinivasan, K., Nair, M., Sreejini, J., & Jyolsna, A. (2013). Report on rapid assessment of the scheme for promotion of menstrual hygiene in Kerala. *Achuta Menon Centre for Health Science Studies*.
- Sudeshna, R., & Dasgupta, A. (2012). Determinants of menstrual hygiene among adolescent girls: a multivariate analysis. *National Journal Community Medicine*, 3(2), 294–301.
- Ten, V. T. A. (2007). Menstrual Hygiene: A neglected condition for the achievement of several millenium development goals. *Europe External Policy Advisors*.
- Thakre, S., Thakre, S., Reddy, M., Rathi, N., Pathak, K., & Ughade, S. (2011). Menstrual hygiene: knowledge and practice among adolescent school girls of Saoner, Nagpur district. *Journal of Clinical and Diagnostic Research*, 5(5), 1027–1033.
- Venemae, V. (2014). *The Indian sanitary pad revolutionary*. BBC News.
- WSSCC. (2013a). *Celebrating Womanhood: How Better Menstrual Hygiene Management is the Path to Better Health, Dignity and Business*. Water Supply & Sanitation Collaborative Council.
- WSSCC. (2013b). *Celebrating womanhood: Menstrual hygiene management, Break the silence*. Water Supply and Sanitation Collaborative Council.