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MENSTRUAL HYGIENE MANAGEMENT AND WOMEN'S ECONOMIC EMPOWERMENT

A Review of Existing Evidence

TETRA TECH

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ACRONYMS AND ABBREVIATIONS

BSR	Business for Social Responsibility
JMP	Joint Monitoring Program
KII	Key Informant Interview
LMIC	Low- and Middle-Income Country
MHM	Menstrual Hygiene Management
MICS	Multiple Indicator Cluster Surveys
PACE	Personal Advancement and Career Enhancement
PMDD	Premenstrual Dysphoric Disorder
PMS	Premenstrual Syndrome
ROI	Return on Investment
RTI	Reproductive Tract Infection
SRH	Sexual and Reproductive Health
UNICEF	United Nations Children's Fund
USA	United States of America
USAID	United States Agency for International Development
WASH	Water, Sanitation, and Hygiene
WHO	World Health Organization

EXECUTIVE SUMMARY

Women and girls all over the world experience challenges in managing their periods, especially those who live and work in environments that do not support adequate menstrual hygiene management (MHM). Adequate MHM is defined by the World Health Organization (WHO), United Nations Children's Fund (UNICEF), and leading scholars as occurring when women and girls have: (i) awareness, information, and self-confidence regarding menstrual hygiene; (ii) access to safe, hygienic, and absorbent materials or products and supplies; (iii) access to safe and clean facilities that are equipped with water and soap to bathe oneself and clean or dispose of materials; and (iv) a supporting environment that allows women and girls to manage their periods without fear of stigma or embarrassment (Patkar, 2011; Sommer & Caruso, 2015; Sommer, Chandraratna, Cavill, Mahon, & Phillips-Howard, 2016; WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation, 2015). To date, MHM research has focused predominately on school-age girls (Phillips-Howard et al., 2016; Sommer, Figueroa, Kwauk, Jones, & Fyles, 2017; van Eijk et al., 2016) and on displaced populations (Schmitt et al., 2017; Sommer, Schmitt, Clatworthy, Bramucci, Wheeler, & Ratnayake, 2016; VanLeeuwen & Torondel, 2018b, 2018a) with much less attention on women and their experiences in the workplace. Yet the challenges experienced by working women may have critical implications for their health and general well-being, as well as for economic outcomes such as work attendance, performance, earnings, and advancement.

To better understand the experiences of working women globally, USAID's Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) project conducted a review of the limited evidence on the adequacy of MHM in the workplace to identify the cost-effectiveness, sustainability, and scalability of approaches to improve conditions. This report presents the findings of the review and describes some of the challenges experienced by working women and provides guidance for future investments. Findings and recommendations are drawn from three complementary lines of inquiry: (i) a systematic review of the peer-reviewed literature; (ii) a comprehensive search of the gray literature; and (iii) key informant interviews with experts in the areas of MHM, gender, and water, sanitation, and hygiene. Interviewing working women was beyond the scope of this desk-based review. The systematic review identified 11 relevant articles (plus one additional article published after the search was completed). The review of gray literature led to the inclusion of 55 documents, and the team interviewed 20 key informants representing international donors, non-profit organizations, and academia.

Observational studies, principally of working women in low- and middle-income countries (LMICs), found that women working in the formal and informal sectors experienced significant challenges in managing their periods, with the situation exacerbated by employment in certain occupations, such as construction and domestic work (Rajaraman, Travasso, & Heymann, 2013). Conditions in formal workplaces may be better than those in informal settings like marketplaces (Rajaraman et al., 2013; Speak Up Africa, 2017); however, women working in factories or offices continue to face significant challenges and barriers to adequate MHM such as toilets that may be of mixed gender, unclean, or unsafe; lack access to water; or be generally unsuitable for managing menstruation (Speak Up Africa, 2017; Taylor, 2011). These studies also examined the relationship between menstruation and absenteeism, finding higher absenteeism among menstruating women in Senegal (Speak Up Africa, 2017) and more robust, causal evidence attributing absenteeism to menstruation (or poor MHM) from four economic studies in Burkina Faso, Italy, and the United States (Herrmann & Rockoff, 2013; Ichino & Moretti, 2009; Krenz & Strulik, 2018; Rockoff & Herrmann, 2010).

The review identified very few interventions or programs that focused specifically on workplace MHM and even fewer that were evaluated. One such intervention, menstrual leave legislation, accommodates

the needs of menstruating women; however, providing women paid leave does not entirely address their sanitation or hygiene needs, the social norms relating to menstruation, or the menstruation-related stigma that women experience in the workplace. Another example of a workplace MHM intervention comes from the HERproject, implemented by Business for Social Responsibility. The HERproject consists of a package of interventions that includes MHM education and the provision of subsidized sanitary pads to factory workers within the context of a broader health program (Yeager, 2011). An evaluation of the HERproject identified quantifiable reductions in absenteeism and staff turnover relating to improved MHM, leading to returns on investment of 4:1 in Egypt and 3:1 in Bangladesh (BSR, 2010; Yeager, 2011). Qualitative evidence also suggests improvements in worker-supervisor relationships, increased knowledge of MHM, and greater sense of agency due to increased knowledge about MHM and other health topics (BSR, 2010; Yeager, 2011). Other ongoing programs such as SNV's Working with Women II and Gap Inc.'s Personal Advancement and Career Enhancement Program, implemented as part of the Women + Water Global Development Alliance, may offer similar insights in the future. Additional documents identified in the review include manuals from organizations such as CARE Canada that provided guidance (rather than mandatory policies) on meeting the MHM needs of women in the workplace.

The link between poor MHM and economic outcomes for women is plausible given the economic impacts of poor sanitation and preliminary evidence noted above. However, there is a need for greater evidence on the poor MHM conditions experienced by women in both informal and formal workplaces and how these conditions may affect women's working experiences and economic outcomes. To date, only evaluation data from the HERproject and economic studies (principally in developed countries) establish the link between improved MHM and better economic outcomes for women (Herrmann & Rockoff, 2013; Ichino & Moretti, 2009; Krenz & Strulik, 2018; Rockoff & Herrmann, 2010), with minimal evidence regarding women's economic empowerment. More research, using both qualitative and quantitative methods and employing longer-term studies, is also needed to further validate the effects of inadequate MHM on women's health and, relatedly, on their economic empowerment (Geertz, Iyer, Kasen, Mazzola, & Peterson, 2016).

A conceptual model illustrates the impacts of inadequate MHM on women and businesses. Additional research, guided by the priorities noted in this report, is needed to establish the relationship more robustly between MHM and women's economic empowerment in LMICs.

The team's recommendations for future interventions include:

- Gather more information on the menstrual experiences of working women (e.g., what are their needs, how do they manage their periods, and what are the limitations they experience?).
- Evaluate interventions in both formal and informal work settings.
- Integrate MHM programming with sexual and reproductive health initiatives.
- Shift focus from hardware interventions that target toilets, facilities, and MHM products to those that address social norms and workplace culture relating to menstruation.
- Generate more data through use of MHM-specific indicators.
- Increase government attention and investment in MHM research and programming.

1.0 INTRODUCTION

Women and girls all over the world experience challenges in managing their periods, especially those who live and work in environments that do not support adequate menstrual hygiene management (MHM). Adequate MHM is defined by the World Health Organization (WHO), the United Nations Children's Fund (UNICEF), and leading scholars as occurring when women and girls have: (i) awareness, information, and self-confidence regarding menstrual hygiene; (ii) access to safe, hygienic, and absorbent materials or products and supplies; (iii) access to safe and clean facilities that are equipped with water and soap to bathe oneself and clean or dispose of materials; and (iv) a supporting environment that allows women and girls to manage their periods without fear of stigma or embarrassment (Patkar, 2011; Sommer & Caruso, 2015; Sommer, Chandraratna, Cavill, Mahon, & Phillips-Howard, 2016; WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation, 2015). A new definition proposed in a recent review considers MHM as a part of a broader conceptualization of menstrual experiences as founded in structures of inequality and disadvantage and linked with health, well-being, gender, education, equity, empowerment, and rights (Hennegan, Shannon, Rubli, Schwab, & Melendez-Torres, 2019a). In light of this more comprehensive definition, this review considers the effects of MHM conditions on multiple aspects of working women's lives: not only on their abilities to manage their periods once a month, but also on their sense of empowerment and on economic outcomes such as employment prospects, earnings, and advancement.

To date, research and programming have focused predominantly on MHM amongst school-age girls (Phillips-Howard, Caruso, Torondel, Zulaika, Sahin, & Sommer, 2016; Sommer, Figueroa, Kwauk, Jones, & Fyles, 2017; van Eijk, Sivakami, Thakkar, Bauman, Laserson, Coates, & Phillips-Howard, 2016) and displaced populations Schmitt, Clatworthy, Ratnayake, Klaesener-Metzner, Roesch, Wheeler, & Sommer, 2017; Sommer, Schmitt, Clatworthy, Bramucci, Wheeler, & Ratnayake, 2016; VanLeeuwen & Torondel, 2018b, 2018a), with much less attention to conditions experienced by women, particularly working women. Indeed, a recent review examining the effects of MHM on education and psychosocial outcomes for both women and girls identified only one study of women (more generally, not specifically in the workforce) (Hennegan & Montgomery, 2016). There is greater focus on women in the studies looking at MHM among displaced populations (Schmitt et al., 2017; Sommer, Schmitt, Clatworthy, Bramucci, Wheeler, & Ratnayake, 2016; VanLeeuwen & Torondel, 2018b, 2018a). Even so, there is limited evidence on how MHM, either poor or improved, affects women in the workplace (Sommer et al., 2016), and there is a dire need to look at how MHM may influence outcomes for working women. The challenges experienced by working women may have critical implications for their health and general well-being, as well as for economic outcomes.

To better understand the experiences of working women globally, USAID's Water, Sanitation and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) project conducted a review of the limited evidence on the adequacy of MHM in the workplace. This report presents the findings of the review. It also identifies approaches to address inadequate MHM conditions, seeking to understand the cost-effectiveness, sustainability, and scalability of these approaches. In doing so, the report describes some of the challenges experienced by working women globally and provides guidance for future investments. This review will be followed by an economic impact study examining the costs and benefits of improved workplace MHM on women's economic empowerment. As such, this review includes a conceptual model linking MHM to outcomes for women and workplaces, as well as quantitative and qualitative estimates of the social costs and benefits of MHM, setting the foundation for an economic impact study and a workplace MHM intervention.

2.0 METHODOLOGY

The research team drew its findings and recommendations from three complementary lines of inquiry: (i) a systematic review of the peer-reviewed literature; (ii) a comprehensive search of the gray literature; and (iii) key informant interviews (KIIs) with experts in the areas of MHM, gender, and water, sanitation, and hygiene (WASH).

For the systematic review, the team searched online databases of peer-reviewed journals (EBSCO, PubMed, Scopus, and Web of Science) using a set of pre-defined terms (Appendix A). The team screened the articles identified through the searches and subsequently extracted the data from included articles (Appendix A). All articles were screened by two reviewers; only one reviewer extracted data because the qualitative nature of data extraction did not require double data extraction. As shown in the search terms and the screening criteria presented in the appendix, the team did not apply any restrictions in terms of geographic context or age. The team included only articles published in English from the year 2000 onwards that discussed menstruation[1] and measured outcomes relating to economic empowerment and conditions or outcomes in the workplace. The team excluded articles that focused on premenstrual dysphoric disorder (PMDD) or premenstrual syndrome (PMS). Although these conditions have implications for absenteeism and women's experiences in the workplace, fully addressing them may require medical attention, particularly for diagnosis and treatment, which is outside the scope of a hygiene-focused intervention.

The team used a similar but less-structured process to identify gray literature (i.e., project reports, briefs, or evaluation reports) and supplemented these with reports and briefs suggested by key informants. Interviews with the key informants contextualized these findings, providing insights on emerging priorities for MHM in the workplace (Appendix B). The team used the same screening criteria to select documents in the gray literature search, namely MHM in the workplace, sanitation for women in the workplace, economic costs of menstruation, menstrual hygiene in factories, and sanitation for women in factories.

The research team integrated the findings from these three lines of inquiry using narrative synthesis. Narrative synthesis is an alternative analytical approach used when it is not appropriate to summarize findings quantitatively from a systematic review such as in a meta-analysis (Popay, Roberts, Sowden, Petticrew, & Arai, 2006). The goal of narrative synthesis is to identify emergent qualitative themes from the literature to tell a story. Given the early stages of the research examining MHM conditions in the workplace and the lack of quantitative evidence from randomized trials or other interventions, narrative synthesis is more appropriate than meta-analysis for the purpose of this review.

To complement the narrative synthesis, the team developed a conceptual model depicting the relationships between MHM and a series of outcomes for women, as well as for businesses. The team complements the conceptual model with a listing of the social costs and benefits of MHM compiled from the documents reviewed. Together, these serve as the foundation for an economic impact study that will accompany a future workplace MHM intervention.

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[1] None of the search terms or the inclusion/exclusion criteria restricted the results to only women rather than all individuals who menstruate. However, search results only generated evidence about women.

3.0 FINDINGS

The team conducted searches as part of the systematic review that turned up 7,708 articles. Of these, 3,124 were duplicates. Title and abstract screening for the remaining 4,584 articles identified 4,565 as irrelevant or relevant but not available in full text (6 articles out of 4,565). Of the 19 remaining articles, the team selected 11 for extraction (see Appendix A). An additional review article was published after the team completed its search; the team added it to to peer-reviewed literature, resulting in 12 peer-reviewed articles included in this review. Of these, three articles examined menstrual hygiene conditions in urban workplaces (both formal and informal) in India, two discussed menstrual leave legislation, three were economic studies looking at the effects of menstruation on absenteeism and wages in higher income settings (the United States and Italy), and four were review papers on MHM, MHM in the workplace, and absences related to menstruation (Table 1).

The comprehensive search of the gray literature identified 55 reports, briefs, and news articles, 20 of which were related to interventions and 7 to menstrual leave legislation. Fourteen described the MHM conditions experienced by women, and 12 provided guidance for MHM and WASH programming to address the needs of women. One was an unpublished working paper that looked at the effect of sanitary pad use on women's absenteeism from work (Krenz & Strulik, 2018), and another reviewed the relationship between MHM and WASH, sexual and human rights, health, education, and economic empowerment for both women and girls (Tull, 2019). As suggested by the number of documents identified through the gray literature search compared to the systematic review, the former offered more insights for the team's research question. Most of the documents identified through the gray literature search focused on women living in low- and middle-income countries (LMICs).

TABLE 1: ARTICLES, REPORTS, AND BRIEFS IDENTIFIED IN THE DESK REVIEW

Description/Topic Area	Systematic Review	Gray Literature
MHM conditions for women	3	14
Guidance for MHM/WASH programming	0	12
MHM in the workplace intervention	0	20
Menstrual leave legislation	2	7
Economic studies	3	1
Review papers/reports	4	1
Total	**12**	**55**

To complement the literature reviews, the team conducted 20 KIIs with representatives from the Bill and Melinda Gates Foundation, Business for Social Responsibility, CARE USA, Emory University, UNICEF, and USAID, among others, to identify additional information regarding workplace MHM interventions, particularly any literature that the team may have missed in the review (Appendix A). (The gray literature described above includes sources suggested during KIIs.) In addition, the team asked key informants to help identify data sources for a proposed economic impact study and any potential partners for a follow-on workplace intervention that builds on the findings of the desk review and economic impact study. All KIIs emphasized the paucity of existing literature and datasets. Additional discussions with representatives of organizations working in MHM, gender, and WASH at the Stockholm World Water Week Conference 2019 revealed that some organizations have yet to focus on the MHM needs of working women (WaterAid Australia), have engaged in work without publishing findings (i.e.,

working with unions in Sweden to institute MHM guidelines [WaterAid Sweden]), or are working on MHM with women (not necessarily within workplaces) as part of broader, ongoing projects (Simavi).

The team presents key findings from these three lines of inquiry below. The findings begin with a presentation of the evidence from observational studies of MHM conditions in the workplace, followed by a section on the implications of poor MHM on economic, empowerment, and health outcomes. The next section discusses two intervention types: menstrual leave legislation and workplace MHM interventions, and then existing guidance on MHM in the workplace. The section then maps the costs and benefits of a generic workplace MHM approach into a conceptual framework and accompanying table of costs and benefits. Section 4.0 presents recommendations for future programming.

3.1 MHM AND WASH CONDITIONS IN THE WORKPLACE

Many of the 67 total articles and reports addressed inadequate MHM and poor WASH conditions experienced by women in the workplace, principally in formal workplaces in LMICs. There was very little investigation of informal workplaces aside from a few documents that discussed conditions in marketplaces or amongst domestic workers. A recent report and review paper identified challenges women and girls experience in managing their periods, including (Geertz, Iyer, Kasen, Mazzola, & Peterson, 2016; Sommer et al., 2016):

- Lack of access to safe and hygienic toilets that afford women and girls privacy;
- Inadequate provisions for managing menstruation such as menstrual products, soap, and water;
- Social norms that stigmatize menstruation; and
- An adverse policy environment that has inhibited investments in MHM programming from governments, nongovernmental organizations, international funders, private sector organizations, and other stakeholders.

The difficulties that women experience at home are only compounded when they leave for work (Sommer et al., 2016). Many women do not change menstrual products when they are away from home (Acebal, 2014; Acebal & Mbaye, 2015; Rajaraman, Travasso, & Heymann, 2013; Speak Up Africa, 2017; WSSCC & UN Women, 2015) and sometimes go all day without changing (Rajaraman et al., 2013), return home to change during their lunch break (if their home is close enough), or end their work day early (Speak Up Africa, 2017). Women working in both formal and informal occupations in India reported feeling a sense of shame when washing menstrual cloths at work and preferred either to stay home while menstruating or wash cloths at home after returning from work (Rajaraman et al., 2013). MHM conditions were particularly dire for women working in the informal sector. For construction workers in Bangalore, this is due to a lack of toilets at work sites or an unwillingness of neighboring houses to let workers use their facilities (Rajaraman et al., 2013). Domestic workers typically are prohibited from using facilities in the homes in which they are employed (Rajaraman et al., 2013). Women working in marketplaces or those who use public transportation have limited access to facilities due to fees for using public toilets and the poor state of public toilets (Rajaraman et al., 2013; Speak Up Africa, 2017). A study of workplaces in the Pikine and Guediawaye regions in Senegal found that there were not enough toilets in marketplaces or they were not accessible, clean, private, or properly separated from men's toilets, leading women not to use them (Speak Up Africa, 2017).

Women employed in formal workplaces such as offices and factories may have better access to facilities, but they still face challenges to adequate MHM given that the toilets may be of mixed gender, unclean, or unsafe; lack access to water; or be generally unsuitable for managing menstruation (Speak Up Africa, 2017; Taylor, 2011). In a study of factory workers in Bangalore, getting permission to use toilets during working hours was hard to obtain; women reported having to wait until tea or lunch breaks when their

supervisors permitted them to go and/or opened the toilets for use (Rajaraman et al., 2013). Use of toilets in these factories was further restricted by inconsistent availability of water for cleaning (Rajaraman et al., 2013). Garment factory workers in Cambodia feared being assaulted while walking along poorly lit pathways to toilets at night (Taylor, 2011).

The need for proper disposal of used menstruation products emerged as a theme from KIIs because of challenges due to stigma and potential harm to sanitation infrastructure when products are flushed or thrown into latrines rather than being disposed of appropriately. These challenges have significant consequences for working women as described in the following section. However, there have been recent advances in addressing the proper disposal of menstruation products. For example, Biomass Controls (a US-based organization) has developed an incinerator that can be installed within a workplace to address disposal in an environmentally safe manner while considering women's needs for privacy when disposing of menstrual products (Biomass Controls, 2019).

3.2 IMPLICATIONS OF POOR MHM IN THE WORKPLACE

Women experiencing inadequate MHM conditions in the workplace face different realities than women who are able to manage their periods adequately. For some, the anticipation of poor MHM conditions in the workplace may act as a barrier to entering the workforce in the first place. For those who do enter the workforce, inadequate MHM may result in greater absenteeism or poorer job performance, both of which are short-term economic outcomes with implications for businesses as well as for women's economic empowerment. Additionally, inadequacies in workplace MHM may also have health consequences for women. The impacts of inadequate MHM are also experienced by businesses whose operations are affected by absent employees, production errors from poorly performing employees, and higher turnover rates. The sections below describe these impacts, which are mapped to a conceptual model (Figure 1) and a table of costs and benefits (Figure 2) later in this report.

3.2.1 ECONOMIC OUTCOMES FOR WOMEN AND BUSINESSES

Absenteeism from work due to menstruation is a critical concern (Spelman & Cookson, 2017). Menstruation-related absenteeism can be attributed to inadequate access to menstrual hygiene products or supplies, poor WASH conditions in the workplace, stigma and shame related to menstruation, and the fear of leakage or anxiety around not being able to manage periods, as noted in the previous section. PMDD/PMS is another driver of menstruation-related absence cited in several economic studies (Herrmann & Rockoff, 2013; Ichino & Moretti, 2009; Rockoff & Herrmann, 2010). For these reasons, women may prefer to stay at home when menstruating, recognizing that they are sacrificing wages, opportunities for advancement, etc.

Absenteeism results in lost wages: in Dakar, Senegal, female market vendors and merchants reported that they could lose between 20,000–45,000 CFA (US$34–70) monthly for missing three days because of menstruation, depending on their business (Speak Up Africa, 2017). Most female vendors preferred remaining home or working only half days because they could not change at the market and could not go all day without changing pads (Speak Up Africa, 2017). The same study estimated that women working in the formal sector miss on average 2.5 days per month (Speak Up Africa, 2017). Studies in the United States and Italy linking menstruation to increased absenteeism find that not only do women take more sick leave (likely due to menstruation), but a small but measurable portion of the gender wage gap can be attributed to increased absences from work (2% in the US and approximately 12% in Italy) (Herrmann & Rockoff, 2013; Ichino & Moretti, 2009). Another study using nationally representative data from Burkina Faso attributed a 21 percentage point reduction in absenteeism to the use of disposable sanitary pads (compared to using other menstrual products, such as cloths) (Krenz & Strulik, 2018). In addition to losing wages, women were also vulnerable to criticism and abuse from supervisors when

they stayed home (Venugopal et al., 2016), even if they took leave that was legally permitted (Lahiri-Dutt & Robinson, 2008). In a case in Maharashtra, India, female cane cutters underwent hysterectomies in response to preferential hiring practices from contractors, so as to avoid having periods and related losses in productivity while working (Jadhav, 2019).

In addition to increased absenteeism and lower wages, another consequence of inadequate MHM in the workplace may be presenteeism, or diminished performance while at work. Poor job performance has implications not only for women in terms of their sense of job satisfaction and advancement opportunities but also for businesses for which production errors and other types of poor performance can hurt the bottom line. Results from the HERproject, discussed in greater detail in a later section, indicate that improved MHM may be linked to higher concentration—likely due to lower psychosocial stress associated with sanitation security, better pain management, and improved relationships with supervisors—resulting in lower incidence of production errors (BSR, 2010). Findings from the HERproject also provide further evidence on the economic impacts on businesses of inadequate and improved MHM in the workplace, as discussed below.

3.2.2 EMPOWERMENT OUTCOMES FOR WOMEN

Although improvements in the economic outcomes noted above are progress toward women's economic empowerment, there is very little information on how MHM may directly affect women's economic empowerment or empowerment more broadly. An earlier review linked MHM to girls' empowerment but provided no information regarding women's empowerment (Geertz et al., 2016). For girls, qualitative evidence and anecdotal data show that menstrual health is associated with dignity and confidence as well as their agency and mobility (Geertz et al., 2016). However, neither Geertz et al. (2016) nor the research team's review found quantitative evidence linking MHM with women's empowerment. Preliminary evidence, largely qualitative, from the HERproject suggests that women who participated in the intervention felt more empowered with information about menstruation and MHM and as peer health educators and leaders in their communities.

3.2.3 HEALTH OUTCOMES FOR WOMEN

Inadequate MHM also has been linked to negative health outcomes for women. Two reviews found that poor MHM was associated with greater risk of gender-based violence, reproductive and urinary tract infections, and increased psychosocial stress (Geertz et al., 2016; Sommer M. et al., 2016). There is substantial research indicating that sanitation insecurity leads to psychosocial stress for women, resulting in long-lasting mental and physical health consequences (Caruso et al., 2017, 2018; Kulkarni, O'Reilly, & Bhat, 2017; Sclar et al., 2018). Sanitation insecurity is defined by Caruso et al. (2017) as: "Insufficient and uncertain access to socio-cultural and social environments that respect and respond to the sanitation needs of individuals, and to adequate physical spaces and resources for independently, comfortably, safely, hygienically, and privately urinating, defecating, and managing menses with dignity at any time of day or year as needs arise in a manner that prevents fecal contamination of the environment and promotes health." Sanitation insecurity has implications for women's ability to manage their periods: namely, anxiety or distress about accessing water, washing and drying menstrual cloths privately, accessing disposable pads, and disposing of them without notice, leading to stress and unhealthy coping behaviors (Caruso et al., 2017). Nearly all women participating in a study in rural Odisha, India, expressed concerns about urination, defecation, and menstruation, noting feeling shame at bathing while having their periods or washing, drying, and disposing of materials (Caruso et al., 2017). A subsequent study by the authors in the same region linked sanitation insecurity with lower well-being (measured by WHO's Well-Being Index) as well as greater anxiety, depression, and distress (Caruso et al., 2018). In other parts of India, women living in slums were more vulnerable to violence due to sanitation insecurity because they risk going defecate or urinate in the open in conditions where public toilets are unsafe,

broken or of poor quality, or closed at nights (Kulkarni et al., 2017). Much of this evidence on health risks pertains to a broader context of inadequate sanitation affecting all women rather than working women specifically. However, as noted previously, the challenges that women face in managing their periods at home may be exacerbated in the workplace, leading to even more pronounced health effects.

More research, using both qualitative and quantitative methods and employing longer-term research durations, is needed to further validate the links between inadequate MHM and health (Geertz et al., 2016) and the resulting consequences for women's economic empowerment.

3.3 EXISTING INTERVENTIONS FOR WORKPLACE MHM

The following sections discuss three intervention types that have been implemented to address MHM in the workplace: menstrual leave legislation and workplace MHM programs, including MHM manuals.

3.3.1 MENSTRUAL LEAVE LEGISLATION

Providing women paid sick leave while menstruating is one way to allow women some flexibility to manage their periods. Several countries—Indonesia, Japan, Korea, and Taiwan—have menstrual leave legislation in place (Belliappa, 2018; Choulamany, 2018; Lahiri-Dutt & Robinson, 2008; Matchar, 2014). In countries without these laws, some businesses have offered their employees paid menstrual leave (Astrup, 2018; Belliappa, 2018; Lewis, 2016; Morris, 2016; Owen, 2018; Pattani, 2018). Private companies in India and the United Kingdom have also offered menstrual leave (Belliappa, 2018; Lewis, 2016; Morris, 2016). The intent of these laws is to make provisions for women who are experiencing severe pain or other menstrual symptoms that are challenging to manage while at work.

However, paid menstrual leave has come under criticism for not addressing the intersectionality of MHM (Belliappa, 2018); giving women leave does not solve issues relating to poor WASH facilities or the stigma relating to menstruation. In addition, paid menstrual leave is vulnerable to the critique that it could be a way for employers to avoid addressing the issue of MHM entirely. In Japan, the introduction of this law after World War II coincided with a time when women were entering the workforce in large numbers and workplaces were unequipped with adequate sanitary facilities (Matchar, 2014). In South Korea, women taking leave have been accused of "making excuses," and some view the policy as "reverse discrimination" (Matchar, 2014; Pattani, 2018). This touches on a critique of paid menstrual leave being categorized as sick leave that associates menstruation with illness, positions women as weaker employees, and detracts overall from their roles as equal employees (Astrup, 2018; Belliappa, 2018). Menstrual leave legislation also may further entrench a power dynamic between supervisors and employees: in Indonesia, women actually have to prove to their supervisors that they are menstruating to be granted the leave (Lahiri-Dutt & Robinson, 2008; Matchar, 2014). Many women are uncomfortable doing so and also fear scorn and anger from their supervisors (Lahiri-Dutt & Robinson, 2008).

Women factory employees in Indonesia often worked through their periods because they were paid overtime for doing so, despite national legislation granting women two days of paid leave while menstruating per month (Lahiri-Dutt & Robinson, 2008). The extra pay exploits the economic vulnerability of women who are only able to subsist on lower wages because they earn extra pay each month while working through their periods (Lahiri-Dutt & Robinson, 2008). This study also found differences in the uptake of leave by women working in different types of jobs at coal mines: women who worked in mine offices did not want to take the leave, preferring to get the extra pay, while women who worked in the pits were essentially forced to take leave because they were unable to manage their periods without accessible or hygienic toilets (Lahiri-Dutt & Robinson, 2008). The distinction between who does and does not take leave also touches on another shortcoming of menstrual leave legislation: government-mandated menstrual leave is only enforceable in the formal

sector and does not address the needs of menstruating women who work in marketplaces or as domestic help.

Despite these shortcomings, however, menstrual leave legislation should be understood as at least a nominal advance for MHM in male-dominated work environments. It is a move toward considering the unique biological needs of women, consistent with more accommodating maternity leave benefits and other gender-sensitive or -inclusive policies that promote women's participation in the labor force (Belliappa, 2018). Broadly, gender-sensitive policies have been linked to greater job satisfaction and better performance as well as lower stress (Belliappa, 2018), and offering paid menstrual leave may lead to higher productivity (Lewis, 2016). However, to date, there has been no evaluation to examine how menstrual leave affects women or employers.

3.3.2 WORKPLACE MHM PROGRAMS

This review did not reveal many workplace MHM programs, and of those that do exist, few have been formally evaluated. The team did identify the following programs: Business for Social Responsibility's HERproject, started in 2007 and funded by the Levi Strauss Foundation, the David and Lucille Packard Foundation, and the Swedish International Development Cooperation Agency; SNV's Working with Women II; and Gap Inc.'s Personal Advancement and Career Enhancement (P.A.C.E.) program as part of the Women + Water Global Development Alliance. All three programs include MHM as one component of a larger health education program targeted toward working women. The only one that has been evaluated to date is the HERproject.

The HERproject has been implemented in Bangladesh, China, Egypt, India, Indonesia, Kenya, Pakistan, and Vietnam in coordination with local partners such as the Aga Khan Foundation and Marie Stopes International (BSR, 2010; Yeager, 2011). The HERproject is a health program that uses a peer education model in which factory workers, line supervisors, clinic nurses, and human resources staff are trained as health ambassadors (Yeager, 2011). The program's 12-to-18-month curriculum is tailored to each worksite's needs and touches on the following topics: hygiene, menstrual hygiene, reproductive health, female anatomy, infectious diseases, sexually transmitted infections, maternal health, family planning, and harassment and abuse (Yeager, 2011). The MHM component of the HERproject provides subsidized pads to workers and information on menstrual hygiene in Levi Strauss & Co., Hewlett Packard, Nordstrom, Timberland, and Williams-Sonoma factories (Yeager, 2011). Although the HERproject does include WASH components (e.g., hand hygiene education and water treatment), it does not address the water and sanitation aspects of MHM (e.g., provision of water and soap for cleaning and washing). The menstrual health component was included because female workers were often absent while menstruating, asked for early leave, or were more likely to make production errors (Yeager, 2011). HERproject sites were originally only factories, but these have been expanded to agricultural settings in East Africa with a further proposed expansion to Asia (M. Yost, personal communication, October 10, 2019). Evaluation data from this expansion are not yet available to the best of the team's knowledge. A further expansion to the MHM component is planned to address social norms relating to menstruation and will target supervisor-employee relationships that make it challenging for women to manage their periods at work (M. Yost, personal communication, October 10, 2019).

The HERproject was evaluated internally in 2011 in partnership with the Meridian Group, an implementing partner of USAID's Extending Service Delivery Project, and supported by the Levi Strauss Foundation (Yeager, 2011). As a whole, the program was found to have an economic return on investment (ROI) of 4:1 in Egypt, largely driven by reduced worker absenteeism and lower turnover. Other outcomes included reduced early leave requests, improved workforce development benefits, enhanced utilization of existing resources such as facility nurses, improved worker satisfaction with management, improved worker health behavior, reduced production errors, and reduced recruitment costs) (Yeager, 2011). It was also associated with a 3:1 ROI in Bangladesh due to 18 percent lower

absenteeism and 46 percent lower turnover (BSR, 2010). The MHM component of the HERproject in Pakistan led to 33 percent of women using sanitary napkins, 28 percent lower absenteeism, 25 percent reduction in poor concentration, and 33 percent less difficulty in meeting production targets among participating women (BSR, 2010). From a business perspective, results from the HERproject demonstrated that there were direct financial benefits of improving workplace MHM conditions, namely through reductions in absenteeism, poor concentration, and staff turnover (BSR, 2010). Qualitative results also suggested improvements in both supervisor-employee relationships and corporate reputations with international buyers resulting from the overall HERproject (rather than only the MHM component) (Yeager, 2011; BSR, 2010).

An external evaluation of the HERproject by Population Council's Evidence Project in 2017 found improvements in women's knowledge of menstrual health; specifically, more women knew that they should dry menstrual cloths in the sun rather than hide them in dark places or stow them under mattresses (Hossain, Mahmud, Bajracharya, Rob, & Reichenbach, 2017). This evaluation also found that the provision of subsidized products led to better menstrual hygiene outcomes compared to outcomes associated with other health topics covered in the HERproject curriculum (Hossain et al., 2017).

Although the intervention did not directly assess economic empowerment-related outcomes such as increased bargaining power or financial independence, women who participated in the intervention reported a greater sense of agency due to increased knowledge about MHM and other health topics and reported serving as liaisons between women and girls in their communities and health workers (BSR, 2010; Yeager, 2011). The intervention also redefined the workplace as a safe space in which women could talk about their health concerns and personal issues (Yeager, 2011) not only to each other but also with their supervisors. In China, the intervention addressed workers' fear of requesting leave when menstruating by breaking down a wall of silence between workers and managers (BSR, 2010).

SNV's Working with Women II project in Bangladesh, funded by the Embassy of the Kingdom of the Netherlands, employs a model similar to that of the HERproject, providing information on menstrual hygiene within a larger health education package that includes content on gender-based violence and health insurance (SNV Netherlands Development Organisation, 2018). The MHM component seeks to change female worker behavior toward more hygienic practices, provide sanitary pads on site, and build the capacity of employers to address MHM (SNV Netherlands Development Organisation, 2019). Working with Women II is a five-year project that started in 2017 and has yet to be evaluated.

Gap Inc.'s PACE program seeks to improve health, well-being, and economic outcomes among workers at Gap Inc. factories (ICRW, 2014). In 2017, a WASH component was added to the program as part of a partnership with USAID and the Women + Water Global Development Alliance (Gap, Inc., 2016). Presentations on the work conducted by the Women + Water Alliance at 2019 Stockholm World Water Week and consultations with CARE USA revealed that MHM is a part of the training curriculum. Although outcomes relating to the WASH and MHM components have yet to be assessed, results from the 2009–2013 evaluation of the program demonstrate positive outcomes for both women and workplaces in terms of greater self-esteem, self-efficacy for workers, improved efficiency, and more productive workplace practices and behaviors (ICRW, 2014).

These three programs—the HERproject, Working with Women II, and PACE—are the only initiatives to address MHM in the workplace, to the best of the research team's knowledge. All three operate in formal workplaces, largely in factory settings. Limited information is available from the HERproject on the impacts of workplace MHM on economic outcomes for women and businesses as well as on empowerment-related outcomes for women. However, more evaluations are needed. Future evaluations of the expansion of the HERproject—into the agricultural sector and toward addressing menstruation-related social norms—will shed further light onto the experiences of different types of working women.

3.3.3 EXISTING GUIDANCE FROM WORKPLACE MHM MANUALS

Additional documents identified in the review include organizational manuals from the International Labour Organization (International Labour Office, 2016), CARE Canada (CARE Canada, 2018), Nepal's Red Cross Society (Nepal Red Cross Society, 2017), and TheaCare (Bhattacharya, 2019), as well as the Toolkit for Integrating MHM into Humanitarian Response (Columbia University & IRC, 2017), *Menstrual Hygiene Matters* (House, Mahon, & Cavill, 2012), and *Gender-Responsive Sanitation Solutions in Urban India* (RTI International et al., 2015). These documents provide guidance for MHM programs in the workplace and future MHM interventions. All of these guidelines, while an advance from workplace policies that ignore MHM, are largely targeted toward women who work in formal workplaces and focus heavily on "hardware" interventions (e.g., on toilets, washing facilities, and disposal). None of these workplace policies—even the institution-specific ones such as that of the Nepal Red Cross Society—are mandatory.

The International Labour Organization's WASH@Work Self-Training Handbook includes a section on MHM describing the challenges experienced by working women and strategies for addressing them (e.g., how to make toilets female and menstruation friendly) (International Labour Office, 2016). The WASH@Work Self-Training Handbook is a training and action manual designed to educate and encourage stakeholders (e.g., governments, employers, and workers) to improve workplace WASH conditions. Although the MHM section comprises only two pages of a nearly 150-page handbook, the recommendations touch on multiple aspects of MHM such as access to facilities and social norms related to menstruation. An updated version of the handbook will include practical guidance for managers and employees, according to a key informant. Similarly, a section in WaterAid's *Menstrual Hygiene Matters* touches on MHM in the workplace (House et al., 2012) and *Gender-Responsive Sanitation Solutions in Urban India,* an RTI publication, provides more general guidance on gender-sensitive sanitation and hygiene solutions, including MHM (RTI International et al., 2015).

CARE Canada also has produced an MHM guide compiled from submissions from female aid workers. The guide includes recommendations for individuals being deployed abroad and organizational-level measures that can be generalized to all organizations (e.g., a section on what female colleagues would like their male colleagues to know about menstruation) (CARE Canada, 2018). The Toolkit for Integrating MHM into Humanitarian Response includes a section on MHM challenges for protection staff (Columbia University & IRC, 2017), and the Nepal Red Cross Society has a similar document (Nepal Red Cross Society, 2017). TheaCare published an e-book that provides strategies for organizations to improve their "period inclusiveness" (Bhattacharya, 2019).

3.4 CONCEPTUAL FRAMEWORK AND TABLE OF COSTS AND BENEFITS

Synthesizing the above findings, the research team developed a conceptual framework that illustrates the links between MHM and outcomes for women, shared outcomes for women and businesses, and outcomes for businesses only (Figure 1). The conceptual framework and the table of costs and benefits (Table 2) are based on a report on building the business case for WASH programs (WaterAid, PwC, & ODI, 2018) and on previous economic evaluations of WASH interventions (Hutton, 2015; Hutton, Haller, & Bartram, 2007; Hutton, Rodriguez, Napitupulu, Thang, & Kov, 2008).

As shown in Figure 1, the team grouped these outcomes into medium- and long-term impacts, acknowledging that the path from improved MHM to women's economic empowerment (measured through financial independence, increased bargaining power, or changes in household roles and responsibilities, etc.) may be mediated by indicators such as: improved health, decreased stigma, reduced psychosocial stress, greater comfort, higher earnings, advancement opportunities, lower absenteeism and presenteeism, higher productivity and performance, higher job satisfaction, job retention and security, and better relationships with supervisors. Similarly, businesses' long-term concern may be the

future revenue stream with medium-term gains measured in terms of lower staff turnover, fewer production errors, improved corporate reputation and corporate social responsibility, etc.

FIGURE 1. LINKS BETWEEN MHM IN THE WORKPLACE AND WOMEN'S ECONOMIC EMPOWERMENT AND BUSINESS OUTCOMES

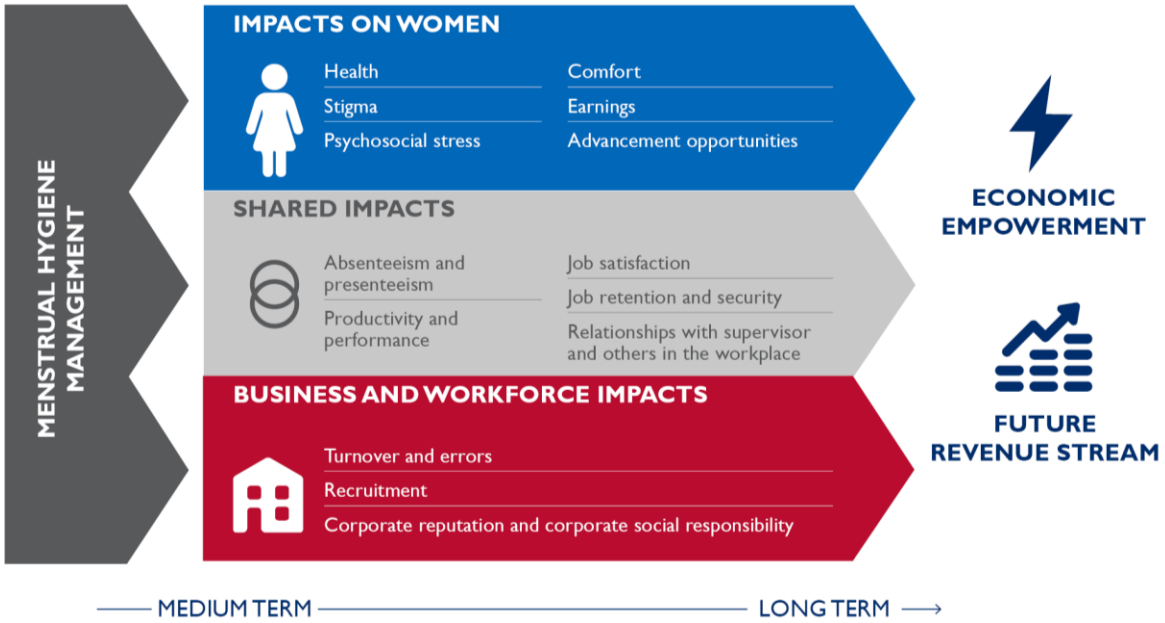
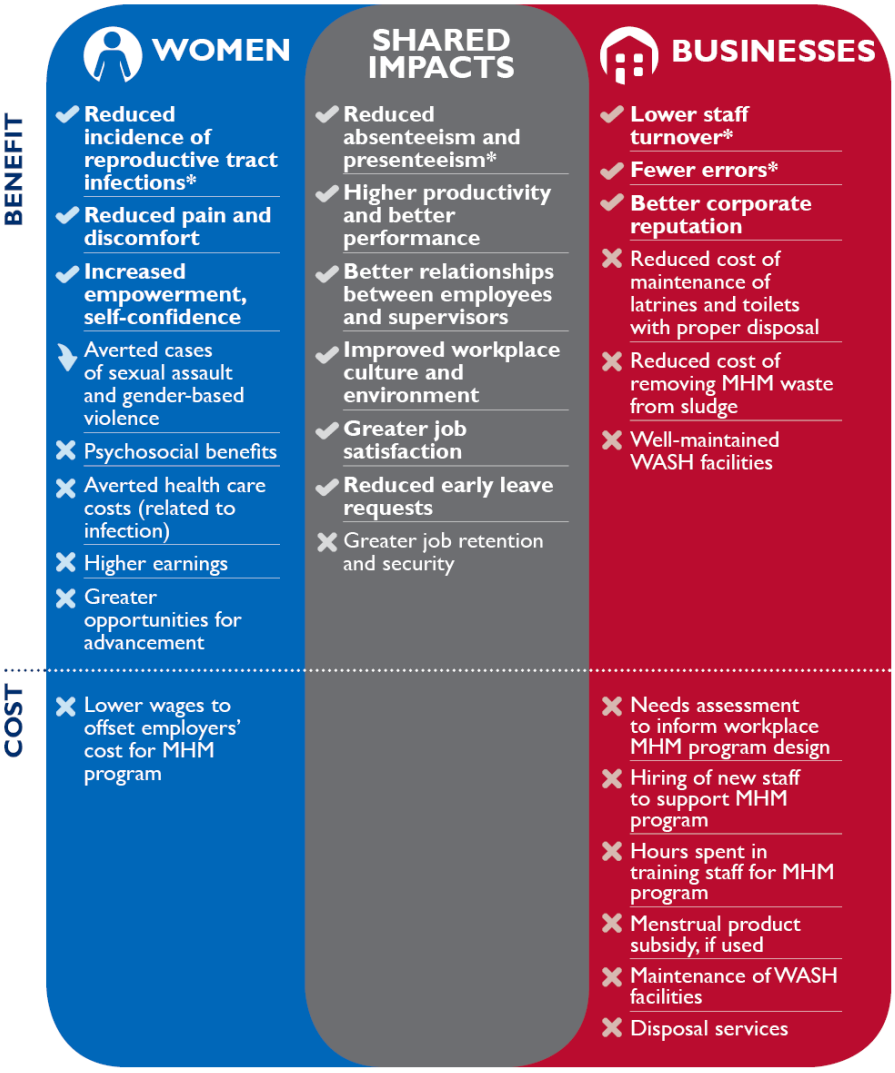


Figure 2 summarizes the evidence to date on the benefits and costs of workplace MHM programs. The table is organized by beneficiary, similar to the conceptual framework in Figure 1, and describes the costs and benefits of a workplace MHM program for each. The table also includes information on the strength of evidence, i.e., whether it is derived from monitoring and evaluation data from a workplace MHM intervention, whether the benefit/cost has been derived from observational data, and whether the information is quantitative or qualitative in nature. Additional information is provided in Appendix C.

There is a lack of information related to workplace MHM programs, not only on the benefits but also on the costs of MHM programs. Available data are principally from the HERproject, which is limited in its scope (i.e., implemented and evaluated only in factory settings) and implemented as a package of interventions.

FIGURE 2. COSTS AND BENEFITS ASSOCIATED WITH IMPROVED WORKPLACE MHM



✔ **Evidence of rigorous quality, e.g., from intervention evaluation (either qualitative or quantitative evidence)**

Evidence of moderate to low quality, e.g., from an observational study (either quantitative [cross-sectional, cohort, etc.] or qualitative design)

✖ No evidence available.

* *Quantitative estimate available.*

4.0 RECOMMENDATIONS FOR FUTURE INVESTMENTS

This section offers recommendations to address gaps in the research and chart future directions for MHM research and programming:

- **Conduct greater research on working women's experiences:** The review revealed limited evidence on the consequences of MHM on economic empowerment-related outcomes for working women. Although there are many qualitative studies describing the experiences of women and girls (Geertz et al., 2016; Hennegan & Montgomery, 2016; Hennegan et al., 2019a), many of these focus on girls, a few on women, and very few on working women. More research is needed to understand, for example, how inadequate MHM can be a barrier to entering the workforce, and for those who do choose and are able to enter the workforce, how menstruation, in addition to other gender-related barriers, can place women at a disadvantage for being hired, recognized for their contributions, remunerated, and promoted. Some evidence is available from interventions at the policy level, namely a few initiatives implemented in factories with female workers. However, more evidence—from both observational studies and interventions—is needed to understand better the particular challenges, needs, coping strategies, and potential solutions for improving MHM for working women, particularly those in the informal sector.

- **Conduct more interventions and evaluations:** Aside from the evaluation of the HERproject and limited data from economic studies, there is little evidence linking improved MHM in the workplace to better economic outcomes or economic empowerment for women. Presumably, there will be further learning from SNV's Working with Women II project and Gap Inc.'s PACE program. Longer-term evaluations of these interventions may also be revealing, specifically to understand whether the effects persist and the degree to which there are spillovers to the community. Replicating these interventions in settings other than garment factories, including in both formal and informal workplaces, would help complete the picture of how MHM can improve the lives of working women.

- **Move toward integrated programming:** Efforts to address MHM to date have been siloed predominantly in WASH, sexual and reproductive health (SRH), and education. Instead, these could be integrated to leverage advances in each field and capitalize on opportunities to employ an intersectional approach (Geertz et al., 2016; Keith, 2016). The reasons for integrating WASH, SRH, and education programming are clear: menstruation begins when girls reach puberty, a critical juncture at which integrated SRH and WASH programming delivered through or in coordination with programs in school (for enrolled girls) as well as out-of-school programs can address the multiple drivers of menstrual health and hygiene outcomes. The implications of integrated programs are far-reaching, addressing the needs not only of adolescent girls but also of adult women who experience long-term consequences of inadequate MHM.

- **Shift focus from hardware to addressing social norms:** Much of the focus of MHM programs has been on products, facilities, and other hardware interventions with little attention to social norms relating to menstruation and women in the workplace (Geertz et al., 2016). It is also critical to address workplace culture that considers women as weaker employees who are not able to contribute as much as men (Belliappa, 2018; Bhattacharya, 2019). Changing these norms will require doing more than providing women with menstrual leave, installing and maintaining female-friendly toilets (Schmitt, Clatworthy, Ogello, & Sommer, 2018), and educating women about menstruation and menstrual hygiene. At workplaces, altering the culture needs an attitude of "period inclusion" in

which women are not penalized or do not experience stigma or lack of opportunities because of their biological need to menstruate. Instead, menstruation should be considered a biological reality that is accommodated in the same ways as employees' other physical and health needs (Bhattacharya, 2019). One suggestion for doing so is engaging management and supervisors, as has been done in the HERproject (Yeager, 2011), to increase their awareness of and support for employees' menstrual health and hygiene needs (Bhattacharya, 2019). Another is to engage male employees and men and boys more broadly to deepen their knowledge, elicit their support, and destigmatize menstruation (Speak Up Africa, 2017). MHM programs should not focus on women alone.

- **Develop better indicators and collect data related to menstruation:** Little data on MHM are available because nationally representative surveys, even ones like the Joint Monitoring Program (JMP) that focus on WASH, have historically lacked MHM-specific indicators. Instead, researchers have proposed and used proxy indicators of MHM, such as handwashing behavior, which provides information about access to water and soap, and open defecation as indications of whether women have access to toilets (Loughnan, Bain, Rop, Sommer, & Slaymaker, 2016). Data on these indicators are available in JMP, the Demographic and Health Surveys, and the Multiple Indicator Cluster Surveys (MICS) (Loughnan et al., 2016). One issue with using these proxy indicators rather than direct measures of MHM is that household surveys often solicit information on WASH from only one member of the household. This person often is a man and thus cannot provide valid information for the women and girls in the household, specifically on their WASH and MHM concerns and needs (Loughnan et al., 2016). Moreover, because of taboos related to menstruation, women and girls may be excluded from using household facilities and thus may not practice the same hygiene and sanitation behaviors as they would when they are not menstruating (Loughnan et al., 2016). Furthermore, these proxy measures focus largely on the hardware aspects of MHM, ignoring the critical element of how social norms relating to menstruation affect women's abilities to manage their periods. Researchers studying menstruation have developed and used a multiplicity of measures (Hennegan, Brooks, Schwab, & Melendez-Torres, 2019); however, there is a lack of consistency in how the measures are defined and in what they measure (Hennegan et al., 2019b). Fortunately, future rounds of both the JMP and MICS and the Demographic and Health Surveys will include MHM-specific indicators, allowing researchers to compare menstrual experiences and MHM-related needs across multiple contexts (Loughnan et al., 2016; World Bank, 2018). The need for more robust and specific indicators and data related to MHM (e.g., change in daily activities due to menstruation, pain/discomfort associated with menstruation, and how women manage their periods typically and what do they need to do so), particularly shedding light on menstruation-related social norms, was also a strong theme that emerged from KIIs.

- **Increase government attention:** To date, most governments have not focused significant attention on or investment in MHM. Yet, governments can be leaders in integrating MHM with other programs. In Kenya, for example, the Ministries of Health, Education, and Gender collaborated with civil society organizations to integrate MHM with other sectors; build capacity at the national, county, and community levels; and develop policies and guidelines (Mirembe, 2019). The Ministry of Education and Sports in Uganda (Wahnschafft, 2017) and the Ministry of Education in Zambia developed MHM programs and guidelines for schools (Government of Zambia, 2016). Similar efforts to institute programs and guidelines for schools may exist in other contexts and provide a precedence for government policies and support for all menstruating people, but these were outside the scope of this review. To the best of the team's knowledge, no national-level guidance specifically for MHM in the workplace exists; rather, the MHM guidelines identified for this report are from civil society organizations. Governments could adapt and adopt those guidelines to provide a framework for employers and workplaces. There is also a need for greater support for research in this area from multiple stakeholders including international funders, governments, and

civil society organizations (Endres, 2016). To date, the private sector with the support of international funders seems to be making the most advances in implementing workplace approaches, albeit in narrow confines (principally in garment factories). More programs are needed across a wider array of workplaces, particularly in the informal sector; in rural areas, where the team found no evidence of programming; and for marginalized individuals such as those living in informal settlements or seasonal migrants.

5.0 CONCLUSIONS

Although there is some evidence suggesting that women experience adverse MHM and WASH conditions in formal and informal workplaces, there are only preliminary results from the HERproject and a small number of economic studies (principally in developed countries) implying that improving MHM will lead to women's economic empowerment. The link between poor MHM and economic outcomes for women is certainly plausible given the economic impacts of poor sanitation (Hutton et al., 2008); however, greater investment, guided by the priorities noted in the previous section—more research on working women through more studies focusing on their menstrual experiences and programs to improve MHM in the workplace, integrated programming that addresses the intersectional nature of MHM and addresses social norms in addition to hardware issues, better indicators and more data relating to menstruation, and greater government attention and prioritization—is needed to fully establish the relationship between MHM and women's economic empowerment.

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APPENDIX A. SYSTEMATIC REVIEW AND GRAY LITERATURE REVIEW METHODOLOGY

Search Terms for the Systematic Review

Relating to Work

Workplace OR employment OR "informal sector" OR job OR labor OR labour OR employee* OR occupation* OR personnel OR industr* OR workforce OR "work force" OR earning* OR wage* OR productivity OR "job satisfaction" OR advancement OR empower* OR "gender equity" OR "gender equality" OR (work AND absenteeism) OR (work AND "missed days")

Relating to Menstruation/MHM/Sanitation Conditions for Women

(("Menstrual cycle" OR menstrua* OR "menstrual hygiene products" OR "feminine hygiene products" OR menses OR menarche OR catamenia) OR

("Menstrua*" OR menarche OR menses OR menarche OR catamenia) AND (hygien* OR sanit* OR management)) OR

(sanit* AND women*))

Inclusion/Exclusion Criteria for Title/Abstract and Full-Text Screening for the Systematic Review

General

1. Is the article in English? (If not, EXCLUDE.)
2. Was the article published in 2000 or later? (If not, EXCLUDE.)
3. Is the article a duplicate? (If so, TAG but DO NOT DELETE.)
4. Is the study a peer-reviewed journal article? Is it a gray literature publication, such as a working paper, technical report, government document, or white paper? (If it is gray literature, TAG it as such but DO NOT EXCLUDE.)
5. Is the article a review paper? (If so, TAG it as such but DO NOT EXCLUDE.)

Relating to Participants

6. Is the article about human menstruation (not any other animal)? (If not, EXCLUDE.)

Relating to Exposures

7. Is the article about menstruation or menstrual hygiene management or sanitation or sanitary conditions? (If not, EXCLUDE. If the article is about PMDD/PMS and does not discuss WASH, then EXCLUDE.)

Relating to Outcomes

8. Does the article measure outcomes relating to economic empowerment (earnings/wages, work absenteeism, employment opportunities, job satisfaction, etc.) or conditions/outcomes relating to the workplace (formal or informal)? (If not, EXCLUDE.)

Data Extraction Template for the Systematic Review

1. Study type:
    - Observational/cross-sectional
    - Experimental
    - Quasi-experimental
    - Review
2. Population
    - Formal labor force
    - Informal labor force
3. Country
4. Menstrual practices or sanitation conditions investigated
5. Any workplace intervention relating to MHM? (This can include a policy or program that is specific to an employer or organization or a national-/regional-/state-level policy.)

6. Key findings relating to MHM for working women or MHM interventions in the workplace

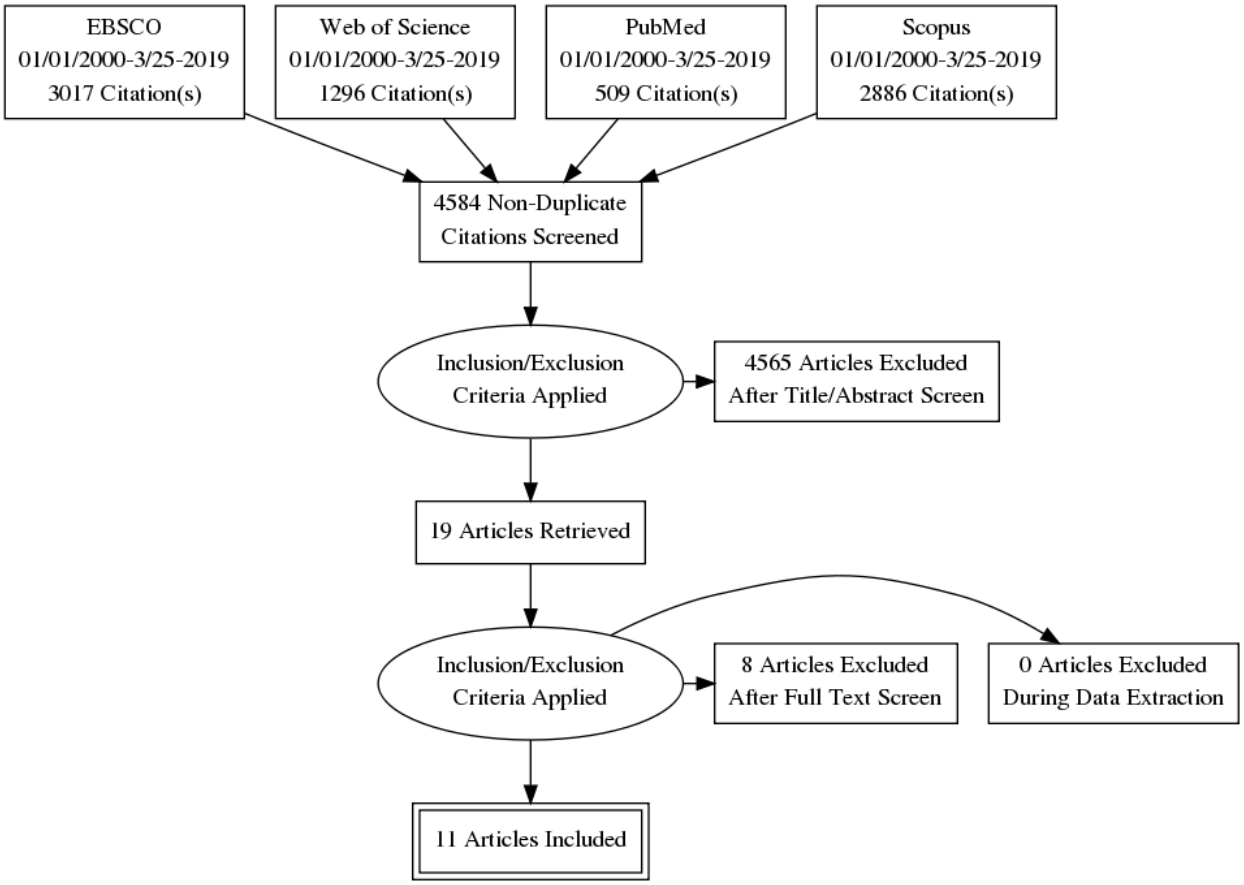
7a. Quantitative economic impacts reported (yes/no)

7b. If so, copy and paste the key quantitative findings.

8a. Does the study use data that can be useful for the economic impact study?

8b. If so, what is the name of the data set?

PRISMA Diagram for the Systematic Review



Search Terms and Databases Consulted for Gray Literature Review

Search terms used:

- Menstrual hygiene management in the workplace
- Sanitation for women in the workplace
- Economic costs of menstruation
- Menstrual hygiene in factories
- Sanitation for women in factories

Databases searched: Google, Google Scholar (for non-academic literature)

APPENDIX B. KEY INFORMANTS AND INTERVIEW METHODOLOGY

List of Key Informants	
Kelly Alexander	CARE USA
Sylvia Cabus	USAID
Carlos Carrion-Crespo	International Labour Organization
Bethany Caruso	Emory University
Sue Cavill	Independent Consultant
Myles Elledge	Biomass Controls
Portia Persley	USAID
Julie Hennegan	Johns Hopkins University
Guy Hutton	UNICEF
Seema Johnson	USAID
Nga Nguyen	USAID
Jan Willem Rosenboom	Bill and Melinda Gates Foundation
Lisa Schechtman	USAID
Niyati Shah	USAID
Jesse Shapiro	USAID
Marni Sommer	Columbia University
Suruchi Sood	Drexel University
Linda Sussman	USAID
Brooke Yamakoshi	UNICEF
Margaux Yost	Business for Social Responsibility

Interview Guide

Name: _____

Title: _____

Organization/Country: _____

Date: _____

Brief Introduction

As part of the USAID-funded WASHPaLS project, Iris is conducting research to understand how improved MHM in both informal and formal workplace settings can improve women's economic empowerment. As a first step, we are reaching out to experts such as yourself to inform our concurrent systematic literature review and gray literature search and our identification of data for the economic impact model.

Questions

1) What have been some key advances in terms of research and programming in MHM in the workplace? Are you aware of any programs or projects that address MHM in the workplace? (Probe: Ask whether the KI has access to any briefs or reports that they'd be willing to share.)
2) Based on your experience in working in MHM, what are some policies or programs that show the greatest promise that might be applicable in the workplace context? (This information will be really helpful in contextualizing our intervention and how we can make the greatest impact through this work.)
3) Can you identify some gaps in MHM programming vis a vis women's health, well-being, and economic empowerment? Or more specifically MHM interventions in the workplace.
4) In your opinion, what are the priorities for future research and programming, especially around workplace issues, or for non-school-aged women?
5) Are you aware of any other literature—either in peer-reviewed journals, conference proceedings, or program reports—that you could share with us?
6) Are you aware of any data on MHM and specifically on MHM in the workplace?
7) In preparations for the research design and implementation phase, we are conducting a landscaping activity of MHM activities and/or WASH programs in workplace settings which could easily integrate an MHM component. Can you refer us to any organizations working in this area, especially in sub-Saharan Africa?

Modeling-Specific Questions

1) What were some of the challenges that you experienced in creating the cost-effectiveness models for WASH?
2) Do you recall any critical considerations that you'd be willing to share with us in modeling the costs and benefits of WASH improvements?
3) Do you have any advice for us as we proceed with the economic impact study?
4) Would you be willing to continue to engage with us on this work? We may follow up with a few questions that arise as we proceed with the modeling.

APPENDIX C. DETAILED BENEFIT INFORMATION FOR WORKPLACE MHM INTERVENTIONS

Category	Benefit
For women	• HERproject – *Pakistan:* Rashes and pain, often due to reproductive tract infections (RTIs), were reportedly reduced by 11% and 18%, respectively (BSR, 2010). – *Bangladesh:* Providing reduced price sanitary napkins to workers at HERproject site reduced prevalence of complaints like fungal infection, vaginal itching, and vaginal discharge, according to health care providers (Hossain et al., 2017). – *Pakistan:* Increased use of and knowledge about sanitary napkins reduced health complaints (BSR, 2010). – *Egypt:* Employees reported reduced experience of menstrual pain after learning about menstrual hygiene (Yeager, 2011). • Odds ratios for RTIs associated with poor MHM (in and out of the workplace) range from 1.34 to 25.07. One study found the reverse: a statistically significant association between the use of pads and RTI, and three reported no association. Use of inappropriate material for absorption was associated with a nine-fold increase in the odds of secondary infertility (Sumpter & Torondel, 2013). • Averted risk of sexual assault. *Cambodia:* Women feared using toilets late at night because they were far from the factory dormitories and had poorly lit pathways (Taylor, 2011). • Greater sense of agency due to increased knowledge about MHM and other health topics and reported acting as health ambassadors in their communities (BSR, 2010; Yeager, 2011).
Shared impacts and outcomes	• HERproject – *Pakistan:* 28% less absenteeism as related to menstruation; number of women who reported taking the maximum number of allowable days off was reduced by 46%; women in the factory worked an average of 2.5 more hours per month during the project period, representing an additional 615 days of work per year (BSR, 2010). – *Pakistan:* Lower number of late arrivals to factory, lower absenteeism, and a high desire by other people to join the factory (Yeager, 2011). – *Pakistan/Egypt:* Greater job satisfaction (Yeager, 2011). – *China:* Workers were more comfortable letting their supervisors know that they needed leave due to menstrual pain rather than offering vague

Category	Benefit
	explanations as they had done in the past. This led to better relationships between workers and supervisors (BSR, 2010). • *Philippines and Vietnam:* "Assuming women employees were absent for one day a month due to a lack of WASH facilities during their menstrual period, the study estimated 13.8 and 1.5 million workday absences in the Philippines and Vietnam respectively, with an economic loss of US$13 million and US$1.28 million per year" (Sommer et al., 2016). • *India:* 10% of women stayed home due to lack of toilets (Venugopal et al., 2016).
Economic (for employers)	• HERproject – *Bangladesh:* ROI of $3:$1 over 18 months (for the entire intervention package, not only MHM) (BSR, 2010); 18% decline in absenteeism; 43% decrease in staff turnover, with ROI of 3:1 (Chowdhury, Wofford, & Dupont, n.d.) – *Pakistan:* 25% reduction in poor concentration in work; 33% less difficulty in meeting production targets as related to menstruation (BSR, 2010). – *Egypt:* ROI of $4:$1 from reduced absenteeism and turnover rates (for the entire intervention package, not only MHM); reduced error rates/mistakes made in manufactured garments (the factory produces 23,000 pieces per day, and each error prevented represents a savings of US$10) (Yeager, 2011). – *Pakistan/Egypt:* Improved reputation of factories with international buyers; improved worker satisfaction with management (Yeager, 2011).

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