

SOCIAL AND PSYCHOLOGICAL IMPACT OF LIMITED ACCESS TO SANITATION:

The link between MHM and reproductive tract infections, and between WASH practices and pregnancy

The SHARE Research Consortium and the Water Supply and Sanitation Collaborative Council (WSSCC) formed a research partnership in 2013 to investigate the specific impact of inadequate access to water, sanitation and hygiene (WASH) facilities on women and girls in India and Bangladesh.

Women and girls are particularly disadvantaged as a result of multiple sociocultural and economic factors that deny them equal rights with men. Millions of women today are denied access or lack the facilities and means to manage the simple biological necessities of defecation and menstruation, and are often forced to adopt a range of coping strategies.

This partnership supports four studies which focus on:

- Specific WASH needs of women and the deleterious impact of coping strategies in Vadu, Maharashtra
- Hygiene in maternity wards in Gujarat and Dhaka
- Social and psychological impact of limited access to sanitation, the link between menstrual hygiene practices and reproductive tract infections, and between WASH practices and pregnancy outcomes in Bhubhaneshwar and Rourkela, Odisha
- Links between the psycho-social stress women face of where to relieve themselves and wider structural inequalities in Pune, Maharashtra and Jaipur, Rajasthan.

All four studies converge on the lack of safe and acceptable choices for women and girls. Links between unsafe sanitation and women and girls' poor health in terms of stress and infections are raised and major evidence gaps are highlighted. The higher incidence of reproductive tract infections linked to poor menstrual hygiene management under socioeconomically deprived groups is striking. Also remarkable is the lack of WASH facilities accessible by pregnant women.

This partnership brings together the expertise of the SHARE Research Consortium in delivering rigorous research relating to key challenges in the sanitation sector with WSSCC's networks and experience in linking policy and practice in developing countries for the realization of the human right to water and sanitation.

While the primary aim of this collaboration is to raise important questions that have not been given sufficient attention, it also aims to catalyze changes in public policy in order to see the rights of Indian women and girls realized.

OUTLINE OF RESEARCH QUESTIONS

Odisha lags far behind much of India in access to toilet facilities and safe drinking water, with 88% of the rural population lacking access to improved sanitation facilities, and open defecation and urination being common practices. Girls and women in India face unique social and cultural challenges in using available sanitation services for their needs. This study explored the hypotheses that: 1) limited sanitation access is a cause of Sanitation-related Psycho-social Stress (SRPS); 2) SRPS leads to open defecation and urination and unhygienic menstrual hygiene management (MHM); 3) women with poor sanitation access and hygiene behaviours are more likely to experience an adverse reproductive health outcome, such as bacterial vaginosis (BV), urinary tract infection (UTI), preterm birth (PTB), or delivery of a low birth weight infant (LBW); and 4) that sanitation access, SRPS, and health risks differ with life-course stage. The overall study goal was to describe the temporal and contextual complexities between poor water, sanitation and hygiene (WASH) conditions, behaviour, and mental and reproductive health among

Indian girls and women (14-45 yrs) during stages of the female life-course (adolescents, newly married, pregnant, other adult) in India.

Susceptibility to infectious pathogens from poor sanitation access and compromised personal hygiene behaviours is well documented. The social and psychological impact of limited sanitation access, particularly among women, and the associated health risks are not well understood.

The first study aims to:

- 1) Develop a conceptual model of sanitation and SRPS among specific life-course stages among women of reproductive age (adolescent, newly married women, pregnant women, and older adult women) in three specific infrastructure-restricted settings: rural, urban slum, and rural indigenous (tribal) communities in Odisha, India.
- 2) Explore the relationships between social, psychological, and personal stressors as they relate to sanitation and sanitation-related behaviours.

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3) Develop and test a quantitative scale for quantifying sanitation-related psychosocial stress and its relationship to global, standardized quality of life and mental health indicators.

MHM practices vary from country to country and depend on a woman's socioeconomic status, personal preferences, local traditions and cultural beliefs, and WASH access. MHM practices can be particularly unhygienic and inconvenient for girls and women in poorer settings. In India, 43% to 88% of girls wash and reuse cotton cloths, rather than using disposable pads. Sanitization of reusable material is often difficult because of poor availability of soap, clean water, and private washing and drying space. A limited body of evidence suggests that unhygienic MHM practices may increase a woman's susceptibility to urogenital infections, such as BV, or UTIs. However, many of the existing studies were of poor quality, and did not account for confounding from underlying environmental drivers of unhygienic

MHM practices, such as sanitation access and poverty. The second study explores whether MHM practices are independently associated with BV or a UTI, given these contextual factors.

Many studies in the US and Europe have demonstrated that clinical history of BV infection, poverty, and high levels of stress are linked to increased risk of PTB among pregnant women. In poor populations, SRPS may directly, through elevated stress biomarkers, or indirectly through hygiene-associated RTI disease, cause downstream adverse birth effects in pregnant women. Basic evidence of a link between individual and contextual environmental factors and birth outcomes is completely lacking for pregnant women living in developing nations. The third study characterizes WASH practices over progressive trimesters of pregnancy, and analyzes whether sanitation-related practices or conditions are associated with an adverse birth outcome, i.e. PTB or delivery of a LBW infant.

APPROACH AND METHODOLOGY

The approach utilizes a baseline cross-sectional survey to quantify WASH practices and reported health history among a randomly-selected subset of girls and women from each of the four life-course groups in tribal, rural, and urban areas of Odisha, and a set of overlapping sub-studies each testing focused hypotheses about pathways between sanitation access, SRPS, hygiene behaviour and health.

Sub-study I:

Social and psychological impact of limited sanitation access:

Data were collected in three phases. Phase 1 used a Grounded Theory approach to examine SRPS in women. In total, 12 focus group discussions (FGDs) and 56 in-depth interviews (IDIs) were conducted. FGDs and IDIs were equally distributed among sites (urban, rural, and indigenous / tribal communities) and life-stage group. Data collection explored topics such as general sources of stress in the household, sanitation practices, and challenges associated with sanitation related activities (i.e. defecation, urination, menstruation, post-defecation cleaning, and bathing), and associated psychological and social impacts. Interview guides were iteratively adapted in light of emerging findings during the data collection process to allow researchers to discuss emergent themes and interrelationships of SRPS factors. In the second phase, structured data collection techniques were used to explore the relationships between stressors and behaviours. A total of 60 respondents – from all life-stage groups and research areas – completed a series of ranking and sorting exercises. Women ranked seven sanitation-related practices (defecation, urination, menstruation, carrying water, post-defecation cleaning, changing clothes for defecation, and bathing) on various criteria – including level of stress, freedom to complete the behaviour as they chose, and the amount of privacy they have when completing the behaviour). Next, women sorted 20 specific sanitation- and sanitation-related challenges identified in the qualitative phase into various categories, including the frequency and severity of the specific challenges.

These data were used to inform a third round of data collection involving surveys in 360 women. Forty-five binary questions were developed that capture various aspects of SRPS. Standardized measures for quality of life and mental health – the WHOQOL BREF, the SRQ20, and the WHO5 – were also included in the data collection. Scaling development procedures will be used to identify a reduced set of questions for measuring SRPS and this measure compared to standardized quality of life and mental health scales. Further analysis will explore predictors of SRPS.

Sub-study II:

Association between MHM practices and BV and UTI:

A case-control study was conducted on 486 women (14-45 years of age) at Capital Hospital, Bhubaneswar, and Ispat General Hospital, Rourkela. Symptomatic cases were non-pregnant women requesting treatment for one or more of the following symptoms: abnormal vaginal discharge (unusual texture and color, or more abundant than usual), burning or itching in the genitalia, or burning or itching when urinating.

Asymptomatic controls attended the participating health centers for other complaints. Vaginal swabs of the posterior vaginal fornix were collected and examined for type of discharge, pH, Whiff test after addition of 10% KOH, and clue cells under wet mount smears. Midstream urine samples were collected for urine culture on HiChrome UTI Agar plates. A sample with > 100,000 colony-forming units of a urinary pathogen per milliliter was considered positive. Then, trained interviewers collected information about the woman's life-stage, socio-economic status (SES), clinical symptoms and reproductive history, and MHM and WASH practices using a standardized questionnaire. Multivariable logistic regression models were built to test for association between MHM practices and symptomatic BV and UTI, as well as lab-confirmed BV and UTI, while controlling from confounding from individual and environmental factors.

Association between WASH practices and pregnancy outcomes:

A prospective cohort of pregnant women (n=670) in their first trimester (12-15 weeks) in rural and tribal locations in Odisha were recruited from the baseline survey and tracked over their pregnancy to document their WASH practices and pregnancy outcomes. A community health worker (CHW) visited the home to obtain consent for participation in the study and to administer a first-trimester questionnaire. The questionnaires recorded women's SES, personal handwashing and bathing practices, defecation practices, and the context of the defecation

site (distance, water availability, hygiene conditions, safety, privacy, accessibility). The CHW then conducted follow-up visits and questionnaires each trimester with the participant until her pregnancy had concluded. The primary birth outcomes of interest were classified as preterm birth (<37 weeks of gestational age) and birth of a low birth weight infant (<2.5 kg), although other secondary outcomes (miscarriage and maternal mortality) were also recorded. Logistic regression models were used to test for association between sanitation-related practices and conditions and each primary birth outcome.

KEY FINDINGS

Key Findings for Policymakers:

- Personal safety - from other people, from men, and from animals - remains a major concern for women in our study. In urban areas, issues of safety focused on sexual assault and sexual violence while rural and tribal women were focused on the risk associated with alcohol abuse among men.
- Traditional gender roles and gender-based restrictions on women's behaviours have significant impact on women's psychological well-being, particularly restrictions placed on women's activities when moving in with in-laws and restrictions on activities during pregnancy. Behaviours that were ranked as the "most stressful" to women (menstrual management, defecation) were also those practices in which women had the least freedom to conduct the behaviour as they see fit. These stressors were particularly pronounced in rural areas in our study where women had the least agency over their daily routines. As with many public health issues, more attention is needed on gender mainstreaming and incorporating women's voices in both sanitation and public policy dialogues.
- Sanitation is more than latrine access or building subsidized latrine. Policy should promote the adoption and use of sanitation facilities/latrines in India in a way that is sensitive to the unique needs of women as they transition from young adults through marriage and pregnancy into traditional adulthood.
- BV and UTI was more common in women using reusable cloth for MHM. The difference was more pronounced in those who changed pads less frequently, and washed and dried them under unhygienic conditions. Use of reusable cloths is more common in socioeconomically-deprived women. Policy makers can address these disparities by (a) Subsidizing the costs of sanitary napkins for economically-deprived groups; (b) improving awareness of hygienic MHM practices through public and school-based education campaigns, including among boys and men; (c) investing in an adequate, well-maintained sanitation facilities with a water supply, particularly in the urban slums; and (d) providing separate, private toilets with a water supply for women in the work place and educational institutions.
- Walking long distances to defecate and carrying water can be physically stressful on pregnant women. Pregnant women need more agency to use nearby, clean, and comfortable facilities.

Key Findings (for Practitioners):

- While most sanitation challenges are universal for women, their relative severity and frequency differed in urban, rural, and tribal areas and among young women, married women, and older adults. Strategies for improving latrine access and use could potentially utilize context-specific promotional strategies to encourage behaviour change.
- Sanitation encompasses much more than defecation, specifically within the Indian context. The act of defecation is embedded within other behaviours, including post-defecation cleaning, ritual bathing, and changing clothing; as well as menstrual management and urination. Strategies to improve sanitation coverage in India must be aware of how defecation practices are positioned within these larger behavioural patterns and responsive strategies are needed in order to facilitate adoption and use of sanitation technologies.
- In response to the range of factors influencing SRPS, many women engaged in maladaptive behaviours such as withholding food or liquid, defecation and urination and in some cases limiting their use of water for personal and menstrual hygiene.
- Health care practitioners should counsel women with RTIs about safe MHM practices, in particular ensuring that communication systems extended through local community-level advocacy and outreach to the poorest women who may not seek treatment.
- Access to safe WASH can be a matter of life and death for a pregnant woman and her fetus. Women who lack access to a sanitation facility or use unhygienic places are more likely to experience maternal mortality and severe pregnancy outcome, which passes the burden of WASH disease on to their neonates. LBW or PTB neonates face higher risks for sepsis and death in the first months, and may be more susceptible to diarrhea and malnutrition. Prenatal care should encompass education of women and their families about how social and SRPS-related stresses and unhygienic physical environments create risks to the mother and infant. Messages should emphasize that healthy mothers create healthy babies.



FURTHER EVIDENCE GAPS

Data analysis is ongoing as of this report. However, the findings demonstrate that the lack of sanitation has important implications for the mental, social, and reproductive health of women in rural India. The next phase of our social research will quantify the magnitude of SRPS and explore the ways in which access to sanitation, family structure, age, and region mediate its impact.

However, there are a number of key questions that have emerged from this study. First, this study focused on women of reproductive age. The psychosocial impacts on women throughout the life-course are not limited to this period. In particular, younger girls and older women are also impacted by the lack of facilities and research is needed on the impacts of sanitation across the full life-source. Second, these studies, while robust, are only cross-sectional in the life course of a woman, and can only assess correlations and not causation. The psychosocial impacts of sanitation access should be incorporated into robust life-course study designs to assess the extent to which changes in sanitation availability impact psychosocial stress.

The MHM studies explored the association between WASH access and MHM practices and BV and UTI outcomes. However, poor MHM likely promotes urogenital disease for a number of various causative organisms, including *Trichomonas vaginalis* (TV) and Vulvovaginal candidiasis (VVC). A pilot study in 40 participants with vaginal discharge found that a significant proportion of women were also positive for VVC and/or TV. More sensitive diagnostic tools

could reveal an even higher infection rate. These findings imply that poor hygiene, especially MHM practices promote infection with a broad array of organisms and may contribute to far more urogenital disease burden among women than expected. Further research should identify the etiology of MHM-associated infection, improve estimates on the burden of MHM-associated disease, and estimate the impact of various MHM intervention strategies on population health. More expansive studies are also needed to explore whether the impacts of poor sanitation access are perpetuated by birth outcome to affect offspring life trajectories.

Results of the current longitudinal follow-up study provide the first evidence that open defecation is associated with higher risk of adverse pregnancy outcomes such as PTB and LBW. Additional studies are required to elucidate the socio-behavioural and/or biological basis of this association so that appropriate interventions can be designed for this important and nagging public health problem. The conceptual model of pathways between sanitation access, hygiene practices, and health is evolving as our preliminary data emerges. Preliminary results from the cross-cutting analysis suggests that sanitation and hygiene-related practices contribute to reproductive disease risks in women through complex biological, environmental, and social pathways. Life course social stage and geography are critical modifiers of the associations between sanitation and RTIs. Sanitation impacts on health in women can be both accumulative and lasting in nature, as well as temporally elevated during critical life course stages. Future research goals will incorporate life-course epidemiology strategies and objective stress biomarkers to test whether biological effects of stress mediate the pathways between poor WASH environments and reproductive health outcomes, and to assess how effects manifest over the life-course. If stress biomarkers do correlate with poor sanitation access, these could be new valid indicators for evaluating the impact of WASH and gender-related interventions in global contexts.

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