VIEWPOINT

Missed Opportunities: Menstruation Matters for Family Planning

By Julie Hennegan, Amy O. Tsui and Marni Sommer

Julie Hennegan is research associate, The Water Institute, Department of Environmental Health and Engineering; and Amy O. Tsui is professor, Department of Population, Family and Reproductive Health–both at Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA. Marni Sommer is associate professor, Mailman School of Public Health, Columbia University, New York.

Increased global attention is being paid to the importance of adolescent and adult women's experiences of menstruation in low- and middle-income countries, and the challenges these experiences present to health, education and gender equality.[1–5] Although much of the focus has been on menarche as a window of opportunity for early engagement in young women's sexual and reproductive health,[6] minimal attention has been paid to the natural linkages between menstrual health and hygiene and females' management of reproduction over their life course.

Menstruation over the Life Course

Menstruation is not a single reproductive event for females, but instead one that recurs frequently over 2–3 decades and is intimately tied to their exposure to the risk and experience of pregnancy and childbirth. Hormonal cycling prompts the preparation of the uterus for pregnancy, ovulation and the sloughing of the uterine lining–menstruation–in the absence of implantation. Menarche signals the capacity to become pregnant and a young woman's entry into the reproductive process; the average female experiences as many as 455 cycles across her reproductive years. The appearance of bleeding each month may be welcomed as a sign of regularity and healthy functioning of her reproductive system. Menstruation signals the absence of pregnancy, which may invoke relief if pregnancy was not desired or fears of infertility, while its nonappearance may indicate pregnancy, desired or unintended. Menstrual cycles are interrupted by pregnancy, postpartum amenorrhea, lactationally induced amenorrhea from breastfeeding and by some contraceptive methods. Women enter perimenopause and periods become less frequent until the menstrual process concludes at menopause. Medical interventions, such as hysterectomies, will also terminate menstruation, as will other treatments for serious illness.

Menstruation in Low- and Middle-Income Countries

An adolescent or adult woman's experiences of her menstrual period are shaped by her physical and sociocultural environment. Although menstruation is a frequent, natural process, it is often shrouded in stigma. Aversion to blood and bodily fluids, and beliefs that menstruation releases "bad" or "unclean" blood, evokes an image of menstruation as dirty.[7] Menstruation's association with female reproduction and sexuality elicits further shame–making the subject taboo. Across the globe, menstruation is experienced negatively and in secret.[1,8,9]

Particularly in low- and middle-income countries, menarche is often met with fear and distress–many adolescent women are insufficiently informed of menstruation's onset, its biological origins or practical management.[9–12] A systematic review of research in India found that, pooled across studies, 48% of young women did not know about menstruation before experiencing menarche.[13] Qualitative studies have shown that adolescent women continue to receive inadequate information about the menstrual cycle, pain, practical management and links with fertility and reproduction, and that these deficits extend into adulthood.[9,14–16] Myths about menstrual bleeding and restrictions placed on menstruating individuals are prevalent across contexts and inhibit social participation.[9,12] Explicit taboos regarding menstruation range in content: They may concern menstrual blood disposal because of fears of infertility or "curses" if others see menstrual blood, or dietary restrictions during menses because of the perceived influences of different types or temperatures of food on blood flow.[9,12,16,17] In some settings, females experience restrictions on participation in religious activities, tending to fields, cooking or undertaking other household chores. Such restrictions are often founded on the belief that menstruating women are impure and pollute the items, crops or food with which they come into contact. Restrictions on women's movement may include confinement to the home, or limitations on school and social participation or interactions with males.[16,18,19]

In low- and middle-income countries, and among disadvantaged populations in high-income countries, menstrual experiences are shaped by the absence of materials and infrastructure to support the hygienic and effective management of menstrual bleeding.[9,20] Findings from national Performance Monitoring and Accountability 2020 surveys across 11 low- and middle-income countries suggest that in most countries, fewer than half of young and adult women reported having everything they needed to manage their periods.[21] Adolescent and adult women commonly report difficulty obtaining preferred menstrual materials; many report that their materials are uncomfortable, cause itching or chafing, move out of place and are inadequate for blood absorption.[22,23] Washing and drying reusable menstrual materials presents a challenge where women have unreliable access to water and soap; lack private spaces for washing; and are unable to openly dry absorbents because of weather, space restrictions or stigma.[14,24] Infrastructure at school, home and workplaces often does not provide sufficient

support for the needs of menstruating individuals.[25] The absence of proper doors or locks means females may not have safe spaces to change their menstrual materials, or they may not have the mechanisms to adequately dispose of used materials.[26] These deficits in physical resources and environments may contribute to reproductive tract infections,[27] stress and insecurity,[28] and present barriers to school and work participation.[2,9]

Menstruation, Reproduction and Contraception

To exercise control over the timing of sexual activity and contraception, females should possess optimal knowledge of their fertility cycle. Fertility awareness, or such "natural" contraceptive methods as the rhythm method, is based on females' and males' understanding of the timing of ovulation. Such knowledge, however, is often imperfect.[29,30] Demographic and Health Survey (DHS) data from the most recent surveys (conducted in 2000 or later) across 71 low- and middle-income countries assessed using STATcompiler confirm a problematic lack of correct knowledge about the menstrual cycle.[31] The overall median of national percentages of interviewed reproductive-aged women correctly answering that the "middle of the cycle" was the most fertile time was 23%, while a higher median of 31% responded incorrectly that this was "after the period ends." This incorrect knowledge of the fertile period is consistent with findings that many adolescent and adult women receive little information regarding their menstrual cycle or associated hormonal fluctuations and bodily processes.[9] While STATcompiler does not include males' fertility knowledge, data from four cities in Uttar Pradesh, India, found only one in five married men accurately identified the most fertile time.[30] Similarly, a qualitative study among adolescent men across three states in India found that they had received little information about menstruation.[32]

Knowledge of fertility and its relationship with menstruation is also needed during perimenopause, given that menopause may not be confirmed until 12 months of amenorrhea. Fecundity levels decline with age, but even at age 45, approximately half of women (45%) are still fecund,[33] and unintended pregnancies can occur. Data on age-specific fertility rates for women aged 45–49 in 71 low- and middle-income countries with DHS data from 2000 onward show an average of 13.5 births per 1,000.[31] The mean proportion of the total fertility rate contributed by women in this older age-group is 2%, and can range from 0% to 5%, depending on the individual country.[34] When women are less knowledgeable about the onset of and hormonal changes associated with menopause, unintended pregnancies may occur, even if contraceptive options exist.

Beyond fertility awareness methods that rely on the female's menstrual pattern to manage pregnancy risk, surgical, barrier and hormonal contraceptive methods may be used. Surgical methods—female and male sterilization—are widely used and offer couples complete relief of concern about pregnancy. Surgical sterilization does not terminate menstruation, and hormone production continues naturally. Barrier methods—including the copper IUD, female or male condom, diaphragm and spermicides—similarly do not disrupt hormonal production or menstruation. Hormonal contraceptives, however, intentionally disrupt the menstrual cycle. Primary types include the pill (daily, monthly, extended and postcoital, as in emergency contraception), patch, vaginal ring, injectable and hormonal IUD; these are administered orally, topically, by intramuscular injection, or by subdermal or uterine insertion. Hormonal contraceptives disrupt menstruation and may have desired or undesired effects on regular bleeding. Hormonal contraceptives can be used clinically to manage or regulate menstrual bleeding and associated symptoms.[35] A literature review by Bahamondes et al. finds that hormonal IUDs, as well as combined oral contraceptive pills, can confer benefits in controlling heavy menstrual bleeding.[36] Further, the authors note that the reduction in blood loss will improve body iron stores and lower the risk of anemia.

The term "contraceptive-induced menstrual bleeding changes" (CIMBCs) has recently entered family planning's discourse[7] and refers to those bleeding changes resulting from contraceptive use. Polis and colleagues'[7] scoping review documents women's responses to CIMBCs, which have long been the principal reason provided for discontinued use, after the desire to become pregnant. CIMBCs often influence nonuse and dissatisfaction, and provoke anxieties about the health effects of contraceptives. Particularly in the presence of weak reproductive and menstrual knowledge and the absence of adequate contraceptive counseling, bleeding changes and amenorrhea can be interpreted by the woman as a risk to her health and fertility.[37–39] In qualitative interviews and focus groups with single and married Angolan women aged 19–54, prolonged or irregular bleeding was cited as a reason for discontinuing the implant;[37] they found the absence of regular menses to be problematic, adding uncertainty as to whether they were actually pregnant or not. A qualitative study of U.S. females aged 14–24 presenting for implant removal within six months of insertion found that many reported being unprepared for bleeding changes, despite being informed to anticipate them.[39]

Missed Opportunities

The current disconnect between menstrual health and hygiene and contraceptive use and care has resulted in missed opportunities to enhance females' menstrual and reproductive experiences, as well as to improve upon programmatic approaches and provider delivery of reproductive health services. These opportunities include early engagement in the adolescent period, improved knowledge of the menstrual cycle and contraception, improved management and experience of menstruation and CIMBCs, and expanded support for adolescent and adult women's sexual and reproductive health autonomy.

• *Early engagement in adolescence.* Most young women will have reached menarche and experienced numerous cycles of menstruation before age 15, when adolescents are commonly targeted for sexual health programming in educational settings. These first years of menstruation present a missed opportunity for reproductive health knowledge to be introduced early. Even in the absence of other sexual health information, which some communities find socially inappropriate, knowledge of the menstrual cycle can improve a female's experiences of menstruation and lay a strong foundation on which to integrate future sexual health and contraceptive education.[6]

Menstruation may also offer an early entry point to a female's engagement with health care providers. Although the subject is underresearched, qualitative studies have found that adolescent and adult women experiencing menstrual difficulties characterized their interactions with care providers negatively.[9] In school settings, young women report school nurses or health care providers to be unsympathetic to menstrual concerns or pain.[9] It is unclear how these early interactions and any subsequent interaction with health care providers regarding menstrual challenges may influence later relationships with care providers for reproductive health needs.

• *Improved knowledge of the menstrual cycle and contraception.* Demystifying the female reproductive system and menstrual cycle by providing timely, accurate information to both females and males is another important reason to link menarche and menstruation more explicitly with the family planning field. Adolescent and adult women will be integrating contraceptive information, services and promotional material with their existing understanding. Assuring there is a solid foundation of accurate menstrual knowledge is essential and may enable improved programming objectives beyond adolescence.

Early, accurate and destigmatizing education on menstruation represents a clear opportunity for dispelling misconceptions about the menstrual cycle, fertility, behavioral restrictions during menstruation, the perceived impurity of menstrual blood and concerns about CIMBCs. Doing so can strengthen contraceptive practice outcomes, and potentially reduce the risk of discontinuation, particularly in Sub-Saharan Africa where unmet need for family planning remains high.[40,41] A further challenge is that when sexual health or contraceptive education is introduced to adolescent men and women in schools, the content focus is often on safer sexual practices and avoiding pregnancy. Such approaches may fail to address misunderstandings of the menstrual cycle and anatomy, menstrual taboos or hygiene management needs.[42]

• *Improved management and experience of menstruation and CIMBCs.* Stigma and restrictions related to menstruation are likely to influence females' perceptions and experiences of CIMBCs. Any breakthrough bleeding is likely to be viewed as menstruation and be imbued with the associated shame and restrictions to daily activities where these are expected. Moreover, menstrual stigma may hinder individuals from discussing bleeding changes and menstrual symptoms or from seeking support from social networks and care providers. Menstrual restrictions and stigma have received negligible research and program attention in terms of their contributions to females' contraceptive experience and satisfaction. Although contraceptive-induced reduction or stopping of bleeding may alleviate the impact of restrictions, contextual understandings of menstruation and amenorrhea may still cause distress. As noted by Polis and colleagues, menstruation is often perceived as the release of "dirty" blood—amenorrhea is viewed with distrust, and a myriad of health concerns are thought to result from "blockages."[7]

To holistically address females' needs and concerns, contraceptive counseling and care must be attentive to the difficulties and complexities of managing CIMBCs across cultural contexts. In proposing the NORMAL (Normal, Opportunities, Return, Methods, Absence of menses and Limit) counseling tool for CIMBCs, Rademacher et al. reviewed a range of existing ones and found that menstrual bleeding changes were insufficiently addressed;[42] this suggests that foundational knowledge is needed to support women's understanding of contraceptive side effects. While Rademacher and colleagues highlight the importance of reassurance that CIMBCs are normal, greater attention to underlying menstrual knowledge deficits, contextual restrictions, stigma and physical management challenges may further equip care providers to deliver holistic care that reinforces adolescent and adult women's confidence and comfort. Moreover, improved menstrual knowledge at earlier ages may reduce the subsequent burden of such counseling.[43] Thus, assessing pervasive stigma and misinformation about menstruation in communities—in addition to reassuring individual women through counseling sessions that CIMBCs are normal—may represent a cost-effective opportunity to improve family planning acceptance.

Finally, difficulties in the physical management of menstrual bleeding and contraceptive-induced bleeding changes represent a further linkage and opportunity to jointly address menstrual and reproductive health challenges. As highlighted above, adolescent and adult women may struggle to manage monthly menstrual bleeding because of limited facilities or supplies. These challenges likely influence the management and experience of breakthrough bleeding and CIMBCs. Such realities may present a disincentive to try contraceptive methods or return to contraceptive methods after pregnancy, given the potential bleeding changes as side effects. Similarly, breakthrough bleeding due to contraceptives—particularly any heavy or irregular bleeding—may result in higher levels of dissatisfaction and discontinuation if women struggle to access supportive materials and environments.

• *Expanded support for sexual and reproductive health autonomy*. Many family planning programs seek to decrease unwanted pregnancy by empowering females to exercise greater control of their bodies and reproductive decision making. This has included empowerment interventions aimed at females avoiding coerced sex, refusing unwanted sex or encouraging shared decision making regarding their contraceptive methods.[44–46] A growing literature has found women's empowerment and education to be positively associated with contraceptive demand and use.[47,48] Yet despite this increased emphasis on women's empowerment and control, experiences of bodily autonomy during menstruation have been neglected.

Adolescent and adult women's menstrual experiences in many settings are characterized by low agency and feelings of control over their bodies.[9] In high-income countries, studies have suggested that menstrual shame and body dissatisfaction influence subsequent sexual decision making and risk-taking.[49,50] Although more research is needed, it is plausible that improved experiences with menstruation offer a pathway to the personal agency family planning programs seek to encourage and promote. While we are not suggesting that improved menstrual experience alone can address gender relationships and power in contraceptive decision making, we view menstruation as yet another domain in which adolescent and adult women experience compromised control over their bodies, and have an opportunity for both autonomy and control.[4]

Conclusions

The menstrual cycle is a central feature of females' lives and is integral to their experiences of reproductive health and family planning. Menstrual health and hygiene should be considered in the delivery of information, in counseling and in discussions of the health effects of using contraceptive methods. The challenges identified by research on adolescent and adult women's menstrual experiences—including knowledge deficits, pervasive stigma, restrictions and difficulties with physical management of menstrual bleeding in resource-constrained settings—are relevant for understanding and improving contraceptive use, uptake, continuation and satisfaction. Increased attention to menstrual health and hygiene presents opportunities to the family planning field for early, comprehensive and lifelong provision of information and support to address a female's concerns about contraception and CIMBCs, and to optimize her ability to manage reproduction and sexual decision making over her life course.

REFERENCES

1. Sommer M et al., A time for global action: addressing girls' menstrual hygiene management needs in schools, *PLOS Medicine*, 2016, 13(2):e1001962, http://dx.doi.org/10.1371/journal.pmed.1001962.

2. Sommer M et al., Managing menstruation in the workplace: an overlooked issue in low- and middle-income countries, *International Journal for Equity in Health*, 2016, 15:86, http://dx.doi.org/10.1186/s12939-016-0379-8.

3. VanLeeuwen C and Torondel B, Improving menstrual hygiene management in emergency contexts: literature review of current perspectives, *International Journal of Women's Health*, 2018, 10:169–186, http://dx.doi.org/10.2147/IJWH.S135587.

4. Bobel C, *The Managed Body: Developing Girls and Menstrual Health in the Global South*, Cham, Switzerland: Palgrave Macmillan, 2018, pp. 281–321.

5. Human Rights Council, United Nations General Assembly, *Report of the Special Rapporteur on the Human Rights to Safe Drinking Water and Sanitation*, A/HRC/39/55, http://ap.ohchr.org/documents/dpage_e.aspx?si=A/HRC/39/55.

6. Sommer M, Sutherland C and Chandra-Mouli V, Putting menarche and girls into the global population health agenda, *Reproductive Health*, 2015, 12:24, http://dx.doi.org/10.1186/s12978-015-0009-8.

7. Polis CB, Hussain R and Berry A, There might be blood: a scoping review on women's responses to contraceptive-induced menstrual bleeding changes, *Reproductive Health*, 2018, 15:114, http://dx.doi.org/10.1186/s12978-018-0561-0.

8. Hawkey AJ et al., Experiences and constructions of menarche and menstruation among migrant and refugee women, *Qualitative Health Research*, 2017, 27(10):1473–1490, http://dx.doi.org/10.1177/1049732316672639.

9. Hennegan J et al., Women's and girls' experiences of menstruation in low- and middle-income countries: a systematic review and qualitative metasynthesis, *PLOS Medicine*, 2019, 16(5):e1002803, http://dx.doi.org/10.1371/journal.pmed.1002803.

10. Sommer M, Ideologies of sexuality, menstruation and risk: girls' experiences of puberty and schooling in northern Tanzania, *Culture, Health & Sexuality*, 2009, 11(4):383–398, http://dx.doi.org/10.1080/13691050902722372.

11. Marván ML and Alcalá-Herrera V, Age at menarche, reactions to menarche and attitudes towards menstruation among Mexican adolescent girls, *Journal of Pediatric and Adolescent Gynecology*, 2014, 27(2):61–66, http://dx.doi.org/10.1016/j.jpag.2013.06.021.

12. Sommer M et al., A comparison of the menstruation and education experiences of girls in Tanzania, Ghana, Cambodia and Ethiopia, *Compare*, 2015, 45(4):589–609, http://dx.doi.org/10.1080/03057925.2013.871399.

13. van Eijk AM et al., Menstrual hygiene management among adolescent girls in India: a systematic review and meta-analysis, *BMJ Open*, 2016, 6(3):e010290, http://dx.doi.org/10.1136/bmjopen-2015-010290.

14. Hennegan J et al., A qualitative understanding of the effects of reusable sanitary pads and puberty education: implications for future research and practice, *Reproductive Health*, 2017, 14:78, http://dx.doi.org/10.1186/s12978-017-0339-9.

15. Chandra-Mouli V and Patel SV, Mapping the knowledge and understanding of menarche, menstrual hygiene and menstrual health among adolescent girls in low- and middle-income countries, *Reproductive Health*, 2017, 14:30, http://dx.doi.org/10.1186/s12978-017-0293-6.

16. Wall LL et al., Tending the "monthly flower": a qualitative study of menstrual beliefs in Tigray, Ethiopia, *BMC Women's Health*, 2018, 18:183, http://dx.doi.org/10.1186/s12905-018-0676-z.

17. Haver J et al., *WASH in Schools Empowers Girls' Education in Masbate Province and Metro Manila, Philippines: An Assessment of Menstrual Hygiene Management in Schools*, New York: United Nations Children's Fund, 2013, http://www.unicef.org/wash/schools/files/Philippines_MHM_Booklet_DM_15__Nov_1010_Single-_Philippines.pdf.

18. Mohamed Y et al., A qualitative exploration of menstruation-related restrictive practices in Fiji, Solomon Islands and Papua New Guinea, *PLOS ONE*, 2018, 13(12):e0208224, http://dx.doi.org/10.1371/journal.pone.0208224.

19. Padmanabhanunni A, Jaffer L and Steenkamp J, Menstruation experiences of South African women belonging to the ama-Xhosa

ethnic group, *Culture, Health & Sexuality*, 2018, 20(6):704–714, http://dx.doi.org/10.1080/13691058.2017.1371335.

20. Girod C et al., Physical, social and political inequities constraining girls' menstrual management at schools in informal settlements of Nairobi, Kenya, *Journal of Urban Health*, 2017, 94(6):835–846, http://dx.doi.org/10.1007/s11524-017-0189-3.

21. Performance Monitoring and Accountability 2020, Menstrual hygiene management, 2018, http://www.pma2020.org/mhm-briefs.

22. Hennegan J et al., Schoolgirls' experience and appraisal of menstrual absorbents in rural Uganda: a cross-sectional evaluation of reusable sanitary pads, *Reproductive Health*, 2016, 13:143, http://dx.doi.org/10.1186/s12978-016-0260-7.

23. Mason L et al., "We keep it secret so no one should know"—a qualitative study to explore young schoolgirls attitudes and experiences with menstruation in rural western Kenya, *PLOS ONE*, 2013, 8(11):e79132, http://dx.doi.org/10.1371/journal.pone.0079132.

24. Caruso BA et al., Understanding and defining sanitation insecurity: women's gendered experiences of urination, defecation and menstruation in rural Odisha, India, *BMJ Global Health*, 2017, 2(4):e000414, http://dx.doi.org/10.1136/bmjgh-2017-000414.

25. Hennegan J et al., The relationship between household sanitation and women's experience of menstrual hygiene: findings from a cross-sectional survey in Kaduna State, Nigeria, *International Journal of Environmental Research and Public Health*, 2018, 15(5):905, http://dx.doi.org/10.3390/ijerph15050905.

26. Schmitt M et al., Making the case for a female-friendly toilet, *Water*, 2018, 10(9):1193, https://dx.doi.org/10.3390/w10091193.

27. Torondel B et al., Association between unhygienic menstrual management practices and prevalence of lower reproductive tract infections: a hospital-based cross-sectional study in Odisha, India, *BMC Infectious Diseases*, 2018, 18:473, http://dx.doi.org/10.1186/s12879-018-3384-2.

28. Hulland KRS et al., Sanitation, stress and life stage: a systematic data collection study among women in Odisha, India, *PLOS ONE*, 2015, 10(11):e0141883, http://dx.doi.org/10.1371/journal.pone.0141883.

29. Pedro J et al., What do people know about fertility? A systematic review on fertility awareness and its associated factors, *Upsala Journal of Medical Sciences*, 2018, 123(2):71–81, http://dx.doi.org/10.1080/03009734.2018.1480186.

30. Verma P, Singh KK and Singh A, Pregnancy risk during menstrual cycle: misconceptions among urban men in India, *Reproductive Health*, 2017, 14:71, http://dx.doi.org/10.1186/s12978-017-0332-3.

31. Special tabulations of data from Demographic and Health Surveys conducted 2000–2018 in 71 low- and middle-income countries, www.statcompiler.com.

32. Mason L et al., "We do not know": a qualitative study exploring boys perceptions of menstruation in India, *Reproductive Health*, 2017, 14:174, http://dx.doi.org/10.1186/s12978-017-0435-x.

33. Long ME et al., Contraception and hormonal management in the perimenopause, *Journal of Women's Health*, 2015, 24(1):3–10, http://dx.doi.org/10.1089/jwh.2013.4544.

34. Eritrea National Statistics and Evaluation Office (NSEO) and ORC Macro, *Eritrea Demographic and Health Survey 2002*, Calverton, MD, USA: NSEO and ORC Macro, 2003.

35. Dianat S et al., Side effects and health benefits of depot medroxyprogesterone acetate: a systematic review, *Reviews in Obstetrics & Gynecology*, 2019, 133(2):332–341, http://dx.doi.org/10.1097/AOG.0000000000003089.

36. Bahamondes L, Valeria Bahamondes M and Shulman LP, Non-contraceptive benefits of hormonal and intrauterine reversible contraceptive methods, *Human Reproduction Update*, 2015, 21(5):640–651, http://dx.doi.org/10.1093/humupd/dmv023.

37. Qiu M et al., Contraceptive implant discontinuation in Huambo and Luanda, Angola: a qualitative exploration of motives, *Maternal and Child Health Journal*, 2017, 21(9):1763–1771, http://dx.doi.org/10.1007/s10995-017-2349-1.

38. Alvergne A, Stevens R and Gurmu E, Side effects and the need for secrecy: characterising discontinuation of modern contraception and its causes in Ethiopia using mixed methods, *Contraception and Reproductive Medicine*, 2017, 2:24, http://dx.doi.org/10.1186/s40834-017-0052-7.

39. Lunde B et al., "Just wear dark underpants mainly": learning from adolescents' and young adults' experiences with early discontinuation of the contraceptive implant, *Journal of Pediatric and Adolescent Gynecology*, 2017, 30(3):395–399, http://dx.doi.org/10.1016/j.jpag.2016.12.006.

40. Population Division, Department of Economic and Social Affairs, United Nations, World contraceptive use 2019, 2019, https://www.un.org/en/development/desa/population/publications/dataset/contraception/wcu2019.asp.

41. Tsui AO, Brown W and Li Q, Contraceptive practice in Sub-Saharan Africa, *Population and Development Review*, 2017, 43(1, Suppl.):166–191, http://dx.doi.org/10.1111/padr.12051.

42. Rademacher KH et al., Menstrual bleeding changes are NORMAL: proposed counseling tool to address common reasons for non-use and discontinuation of contraception, *Global Health, Science and Practice*, 2018, 6(3):603–610, http://dx.doi.org/10.9745/GHSP-D-18-00093.

43. WaterAid and Marie Stopes International Australia, *Integrating Menstrual Health, Water, Sanitation and Hygiene, and Sexual and Reproductive Health in Asia and the Pacific Region*, Melbourne, Australia: WaterAid, 2018, https://washmatters.wateraid.org/sites/g/files/ jkxoof256/files/Integrating%20Menstrual%20Health%2C%20Water%2C%20Sanitation%20and%20Hygiene%2C%20and%20Sexual%20and%20Reproductive%20Health%20in%20Asia%20and%20the%20Pacific%20Region.pdf.

44. Chandra-Mouli V, Camacho AV and Michaud P-A, WHO guidelines on preventing early pregnancy and poor reproductive outcomes among adolescents in developing countries, *Journal of Adolescent Health*, 2013, 52(5):517–522, http://dx.doi.org/10.1016/j.jadohealth.2013.03.002.

45. Starrs AM et al., Accelerate progress—sexual and reproductive health and rights for all: report of the Guttmacher-*Lancet* Commission, *Lancet*, 2018, 391(10140):2642–2692, http://dx.doi.org/10.1016/S0140-6736(18)30293-9.

46. Hindin MJ et al., Interventions to prevent unintended and repeat pregnancy among young people in low-and middle-income countries: a systematic review of the published and gray literature, *Journal of Adolescent Health*, 2016, 59(3, Suppl.):S8–S15, http://dx.doi.org/10.1016/j.jadohealth.2016.04.021.

47. Wulifan JK et al., A scoping review on determinants of unmet need for family planning among women of reproductive age in low and middle income countries, *BMC Women's Health*, 2016, 16:2, http://dx.doi.org/10.1186/s12905-015-0281-3.

48. Atiglo DY and Codjoe SNA, Meeting women's demand for contraceptives in Ghana: does autonomy matter? *Women & Health*, 2019, 59(4):347–363, http://dx.doi.org/10.1080/03630242.2018.1500413.

49. Schooler D, Cycles of shame: menstrual shame, body shame and sexual decision-making, *Journal of Sex Research*, 2005, 42(4):324–334, http://dx.doi.org/10.1080/00224490509552288.

50. Schooler D, Early adolescent body image predicts subsequent condom use behavior among girls, *Sexuality Research and Social Policy*, 2013, 10(1):52–61, http://dx.doi.org/10.1007/s13178-012-0099-9.

Author contact: *jhenneg1@jhu.edu*