

Policy Document

Menstrual Health & Hygiene, and Family Planning (2022)

Position Statement

AMSA believes that:

1. Menstrual health is a global health priority given its relationship with wellbeing, rights and equity. All individuals who menstruate should be able to progress through the entirety of the menstrual cycle in a safe and dignified manner free from the burden of stigma and discrimination. This includes having access to safe, appropriate, and culturally-sensitive menstrual hygiene materials, supplies, services and knowledge;
2. An individual's choice to bear children, including the number, timing and termination of pregnancies, is a fundamental human right;
3. Infertility is an under-recognised health issue worldwide. All people should be offered fertility counselling with consistent mental health support throughout treatment;
4. Equitable access to contraceptives is pivotal to achieve better health outcomes for individuals. A range of barriers continue to prevent contraceptive access across the world;
5. There are fundamental inequities in the ability of vulnerable communities to access and utilise menstrual health and family planning services. Additional research regarding the barriers of vulnerable populations' access to menstrual health and family planning services is needed, with such research being reflected in public health education and promotion;
6. Mental health services need to be made more accessible within settings such as family planning services and sexual health clinics;
7. Sexual and reproductive health education should be publically accessible and address the multiple causal factors, such as discriminatory societal norms, cultural misconceptions and medical myths, that diminish autonomous and informed decisions regarding menstrual health management and contraceptive use.

Disclaimer: AMSA recognises the importance of respectful and inclusive language which reflects the diversity of individuals impacted by menstrual health and family planning, including individuals who are transgender, gender diverse, and non-binary (henceforth respectfully referred to as TGD), and non-traditional family structures. However, there is a predominance of gendered



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language and cisgender terminology within discussion and literature, and thereby gendered language has been used only when specifically referenced within the literature. Nevertheless, the use of gender-neutral and gender-additive terminology has been used where possible, particularly within AMSA representative stances to support inclusivity and understanding in these topics in the future.



Policy Points

AMSA calls upon:

1. **International governments, the World Health Organisation and relevant Non-State Actors to:**
 - a. Implement policies, strategies and programmes to support the creation of a safe and positive environment for menstrual cycle management by ensuring menstrual materials, supplies and services are safe, available, usable, culturally-appropriate, effective and affordable. This should include:
 - i. The removal of educational and financial barriers like “tampon taxes” that impede access to appropriate menstrual hygiene materials;
 - ii. Additional strategies to ensure equitable support of all groups, including refugees and migrants, rural and remote populations, TGD individuals and individuals living with disability and experiencing homelessness;
 - iii. Packaging menstrual hygiene products with accurate product information, and relevant side effects;
 - b. Sustainably finance family planning and menstrual health services into initiatives that address universal health coverage and health systems strengthening;
 - c. Condemn discriminatory social norms and cultural misconceptions that impede upon healthy menstrual health, and family planning practices;
 - d. Implement multi-faceted and sustainable solutions to improve sexual and reproductive health outcomes, such as:
 - i. Increasing accessibility to sexual and reproductive health education;
 - ii. Ensuring menstrual hygiene and family planning materials, supplies and facilities that are affordable, available, private and safe;
 - iii. Create, or promote and develop existing, safe and accessibility healthcare services which support individuals in making informed decisions regarding one’s sexual and reproductive health;
 - e. Fund and ensure the provision of accurate and accessible information on menstrual health throughout the course of life to enable appropriate evidence-based and autonomous decision-

making that is unaffected by stigma and aligns with individual health goals and life choices, covering topics including:

- i. Normal menstruation and menstrual health care;
 - ii. Accessibility to sexual and reproductive healthcare facilities and products, including menstrual health and hygiene, contraception, and family planning services. This should include discussion on side effect profiles, cost and convenience;
 - iii. The intentional decision by individuals to be child-free;
- f. Implement accurate and comprehensive reproductive health education programmes into all school curricula that:
- i. Increase all individuals' awareness regarding sexual and reproductive health, including menstrual health and family planning services;
 - ii. Develop skills for menstruating safely and with dignity, including normal menstruation, and recognising features of atypical sexual and reproductive health such as premenstrual syndrome and symptoms such as dysmenorrhoea and abnormal uterine bleeding;
 - iii. Discuss available contraception and their various mechanisms of action, costs, benefits, risks and limitations;
 - iv. Address discriminatory social and cultural misconceptions which contribute to reduced menstrual health and hygiene management, diminish proper contraceptive use, and impede access to family planning services;
 - v. Destigmatising infertility, childlessness, and the choice to be child-free;
 - vi. Discusses the causes of infertility, and the services available to those seeking treatment or advice;
 - vii. Recognise and discuss the range of reasons why an individual may choose to be child-free;
- g. Evaluate the effectiveness of any interventions implemented to ensure solutions give rise to maximum benefits in working towards the safe and dignified management of menstrual cycles for all individuals who menstruate;
- h. Create and implement regulations that provide protections for
- i. Surrogates; and
 - ii. Individuals seeking surrogacy;
- i. Improve regulations that provide protections for individuals seeking access to commercial reproductive services;

2. The Australian Federal and State and Territory Governments to:

- a. Address factors contributing to poor menstrual health in disproportionately affected populations including:
 - i. Aboriginal and Torres Strait Islander peoples;
 - ii. Refugees and migrant;
 - iii. rural and remote populations;

- iv. TGD individuals;
 - v. Individuals living with disability and;
 - vi. Individuals experiencing homelessness;
- b. Implement financial and educational interventions to improve accessibility to menstrual hygiene materials, and battle period poverty, including finalising and implementing policies to remove taxes on menstrual hygiene management products;
- c. Ensure adequate care is provided to individuals who menstruate whose participation in work and other activities is impaired by menstruation, including health and social considerations, such as access to healthcare and appropriate leave;
- d. Implement mandatory education on menstrual health and family planning into schools (including independent schools) to limit the number of students and young people exposed to abstinence-only education;
- e. Ensure that all people have equitable access to safe and effective family planning and fertility healthcare services with standardised and continuous care throughout Australia as part of Universal Health Coverage;
- f. Provide equitable access to safe termination of pregnancy with adherence to the points outlined within the 'Access to Safe Termination of Pregnancy (2021)' policy;
- g. Increase funding and promotion for digital health services for family planning services to increase accessibility for those who face barriers such as distance or language, and for those seeking timely high-quality support and advice from qualified health professionals;
- h. Improve affordability and accessibility to menstrual hygiene products and contraceptive products through the listing of such products on the Pharmaceutical Benefits Scheme;
- i. Improve legislation and accessibility to social policy incentives that help prevent late first births such as:
 - i. Adequate maternity and paternity leaves;
 - ii. Low-cost childcare; and
 - iii. Affordable housing
- j. Standardise and implement guidelines for prospective parents in accessing assisted reproductive technologies, adoption, and surrogacy including:
 - i. Suitability for family planning; and
 - ii. Family counselling;
- k. Provide advice and transparency for accessing surrogacy including:
 - i. Requirements for accessing surrogacy;
 - ii. Protections for surrogates;
 - iii. Support for prospective parents seeking to access surrogacy; and
 - iv. Advice on prospective parents looking to access surrogacy overseas.

- i. Create and implement regulations to protect individuals who choose to access commercial surrogacy overseas, especially from ACT, NSW and Queensland where surrogacy is illegal locally;
- m. Allocate more funding to research on menstrual health and family planning research. In particular, research should address points described in Policy Point 3.

3. Research institutes to:

- a. Conduct further research that is inclusive, culturally-sensitive and representative of the diverse populations in Australia, such as TGD, refugees and asylum seekers, Aboriginal and Torres Strait Islander peoples, rural and remote populations, individuals living with disability, and individuals experiencing homelessness. This should cover topics including:
 - i. Improving identification of menstrual health problems;
 - ii. Optimising menstrual health management by enabling greater accessibility to hygiene materials by addressing various factors including geographical, cultural and financial factors, using methods that are:
 - 1. Community-driven and culturally appropriate to maximise their benefit to minority demographics such as Aboriginal and Torres Strait Islander peoples and;
 - 2. Increase the likelihood of communities benefiting maximally, including those of Aboriginal and Torres Strait Islander origin;
 - iii. Frameworks that maximise the sustainability of solutions targeting unmet menstrual health and hygiene needs while ensuring acceptability and cultural sensitivity;
 - iv. Methods of menstrual health management that are effective in maximising social, physical and emotional safety as well as providing freedom from undesirable attention;
 - v. Research into the barriers affecting access to menstrual health and family services;
 - vi. Utilise population-based data to further research functional limitations and disability-related factors affecting use of contraceptives and access to menstrual health and family planning services by individuals living with disability;
 - vii. The population-level consequences of reproductive healthcare disparities among individuals living with disability;
 - viii. The knowledge gaps regarding TGD individuals, particularly on how to optimally overcome barriers to accessing menstrual hygiene management materials, supplies, and facilities, and to engaging with healthcare services;
 - ix. The barriers to gender-affirming and non-stigmatising medical care for TGD individuals, expanding reproductive

health data that is currently predominated to reflect transgender men and non-binary individuals with natal female anatomy;

- x. The determinants of contraceptive use and reproductive health service engagement by individuals in refugee and migrant populations;
 - xi. Specific factors that would influence contraceptive use and family planning needs of individuals experiencing homelessness, such as trends in infertility issues;
 - xii. The relationship between living in rural and remote areas and menstrual health, particularly in high income countries, examining specific differences in menstrual health outcomes;
 - xiii. Factors influencing the rural-urban disparity in menstrual health and family planning services and contraceptive use, such as the higher rate of long acting reversible contraceptives and irreversible contraceptives in rural and remote populations;
 - xiv. Further understanding, and ensuring long-term follow up on, the effects of surrogacy on both intended parents and surrogates;
- b. Evaluate current strategies and address limitations in research on menstrual health and family planning by:
- i. Investigating how best to address misinformation surrounding menstrual health and family planning;
 - ii. Conducting further research on the relationship between mental health and the combined oral contraceptive pill (COCP);
 - iii. Researching further into the sociocultural constraints and barriers to ensure the provision of culturally sensitive and safe frameworks, education, products, and services;
 - iv. Advocating for the findings of research to be reflected in implemented solutions to ensure evidence-based and culturally-sensitive practice;
 - v. Identifying and advocating for the implementation of maximally effective and economical changes.

4. Health professionals and healthcare providers, including hospitals, to:

- a. Practice culturally appropriate, sensitive, and evidence-based care for individuals seeking sexual and reproductive health treatment including:
 - i. Menstrual health and hygiene management and treatment for menstrual related disorders. This includes having access to appropriate education, upskilling, and resources to ensure the optimal treatment of menstrual health problems such as dysmenorrhoea and abnormal menstrual bleeding;

- ii. Contraceptive use, including cost, where to access contraceptives and side effects;
- iii. The risks and complications of pregnancy with consideration to age, nutrition, smoking, alcohol and toxin use, and environment;
- iv. Alternative options for conception if infertile, including in-vitro fertilisation (IVF), adoption, and surrogacy;
- v. Screening and risk mitigation measures for couples seeking to access family planning services;
- vi. Ensuring accessibility to people with disabilities;
- b. Provide scientifically accurate contraceptive services and advice that challenges social and cultural misconceptions;
- c. Limit the perpetuation of misinformation in the provision of sexual and reproductive counselling services by taking every opportunity to provide accurate education to individuals and to advocate for the sharing of evidence-based knowledge;
- d. Challenge miseducation, stigma, and discriminatory social norms in regards to menstruation and contraceptive use;
- e. Ensure healthcare services provided are:
 - i. Accessible in a timely fashion to all individuals regardless of geographical or socioeconomic status;
 - ii. Safe and inclusive for all individuals who menstruate irrespective of cultural background, gender identity/expression, sexuality/sexual orientation, sex characteristics, and/or functional status
 - iii. Receptive to the sexual and reproductive health needs of applicable demographics;
 - iv. Respectful of the autonomy of individuals living with disability, irrespective of the desires of third-parties such as primary caregivers;
 - v. Proactive with patient education regarding contraception and family planning, addressing common misconceptions regarding these topics, while providing them with evidence-based information and resources.
- f. Provide safe, culturally-sensitive and inclusive fertility/family counselling including mental health services for grief associated with infertility, including termination or loss of pregnancy

5. Medical schools, universities, educational institutions and other health professional training bodies to:

- a. Provide evidence-based education and clinical training for medical students and doctors in training with respect to:
 - i. The physiology of the menstrual cycle over the lifespan, including awareness of pathophysiological changes, so that medical students are positioned to advocate and raise awareness to address menstrual hygiene inequalities;

- ii. The relationship between lifestyle factors and menstrual health promotion;
- iii. Addressing the mental health difficulties that accompany hormonal contraceptive use and pathophysiological changes in the menstrual cycle;
- iv. The biological mechanisms of available contraceptive options, and contraindications of each type;
- v. The balance of good clinical practice, respecting social and cultural norms during the provision of evidence-based sexual and reproductive counselling;
- vi. The use of inclusive language when discussing menstrual health and family planning;
- vii. Education on the differences and challenges that low and middle income countries face surrounding menstrual health;
- viii. The provision of contraception methods to individuals living with disability that is appropriate and mindful of their contraindications with varying types of disabilities and their severity;
- ix. The additional medical, surgical, and sexual histories that must be considered in the menstrual health, contraceptive, and family planning counselling of TGD individuals;
- x. The importance of gender-affirming care for all TGD individuals by avoiding cisgender and heteronormative assumptions and being respectful of potential gender dysphoric traumas.



Background

Definitions

- **Menstruation:** “Menstruation or menses is the natural bodily process of releasing blood and associated matter from the uterus through the vagina as part of the menstrual cycle” [1].
- **Menstrual health and hygiene:** “Menstrual health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity, in relation to the menstrual cycle” [2]. It “encompasses both menstrual hygiene management and the broader systemic factors that link menstruation with health, well-being, gender equality, education, equality, empowerment, and rights. These systematic factors have been summarised by UNESCO as accurate and timely knowledge, available, safe, and affordable materials, informed and comfortable professionals, referral and access to health services, sanitation and washing facilities, positive social norms, safe and hygienic disposal and advocacy and policy” [1].
- **Menstrual hygiene management (MHM):** “Refers to management of hygiene associated with the menstrual process,” whereby individuals who menstruate “are using a clean menstrual management material to absorb or collect menstrual blood, that can be changed in privacy as often as necessary for the duration of a menstrual period, using soap and water for

washing the body as required, and having access to safe and convenient facilities to dispose of used menstrual management materials. They understand the basic facts linked to the menstrual cycle and how to manage it with dignity and without discomfort or fear” [1].

- **Menstrual hygiene materials:** “The products used to catch menstrual flow, such as pads, cloths, tampons or cups” [1].
- **Menstrual supplies:** “Other supportive items needed for MHH, such as body and laundry soap, underwear and pain relief items” [1].
- **Menstrual facilities:** “Facilities most associated with a safe and dignified menstruation, such as toilets and water infrastructure” [1].
- **Contraception:** Methods and measures that prevent pregnancy that may consequence from vaginally penetrative sexual intercourse. Broadly, the types of contraceptives include: barrier contraceptives, short-acting hormonal contraceptives, long-acting, reversible contraceptives, and surgical contraceptives [3].
- **Childless:** A term that describes individuals who do not have children because they are unable to, due to reasons such as infertility [4].
- **Child-Free:** Commonly referred to as being ‘voluntarily childless’, being ‘child-free’ describes individuals who explicitly and intentionally choose not to have or bear a child [5]. With stigma against child-free individuals existing in pronatalist cultures and societies, such as Japan, there has been additional research into the determinants of choosing to be child-free; however, the majority of literature fails to distinguish between being childless and child-free [5,6].

Menstrual Health and Hygiene

Around the world, 1.8 billion people undergo the biological process of menstruation every month [1]. Many are ill-equipped to practise menstrual hygiene management, and do so in secrecy [7,8,9]. The physiological, environmental, sociopolitical and psychological factors linked with menstruation affect the health of those who menstruate in physical, emotional and mental ways [7,9]. However, the effects of menstruation extend beyond health alone, and encompass factors such as wellbeing, rights, education and equality [10,11]. Hence, the healthy and dignified management of menstrual cycles is extremely important for individuals who menstruate; although, factors including insufficient basic services, poverty, inadequate education, cultural taboos and gender inequality preclude millions from this right [1,7]. This is a global health issue that can further exacerbate existing public health, and sexual and reproductive health issues like gender inequality and poverty [1,12]. It can also mean that many people who menstruate do not understand the difference between physiological and pathophysiological menstrual cycles, potentially resulting in individuals suffering without knowing to seek help for issues including endometriosis, or abnormal uterine bleeding and its sequelae. These problems exist in different ways in low and middle income countries (LMIC), and high income countries (HIC) [1,9,13].

Overall, this has significant ramifications for individuals who menstruate by restricting choices, mobility and freedom, as well as their broader communities.

Thus, it affects one's ability to attend and participate in activities, including those relating to education, work and health, which can affect economic opportunities. It can also give rise to anxiety, stress and shame, and compromise the safety of individuals who menstruate [1,9,13]. These issues disproportionately affect different groups, including Aboriginal and Torres Strait Islander peoples, homeless, and TGD individuals [1,14,15]. Better menstrual hygiene management has been associated with improved quality of life throughout its course [16,17].

Barriers to Access

Access to menstrual health and hygiene education, materials, supplies and facilities is essential for individuals who menstruate to be able to undertake menstrual hygiene management in a healthy and dignified fashion [9]. Different barriers include: those arising from insufficient understanding of menstrual health and hygiene; and inadequate access to menstrual health and hygiene products and facilities. Factors that can contribute to the aforementioned barriers include: geographical, financial, sustainability, legislative and mobility issues [1,9,13].

Types of Barriers

Educational issues arise from both the lack of accurate information on menstrual health and hygiene, and an abundance of misinformation and stigma on such matters in various settings, including in LMIC and HIC [9,13]. This lack of knowledge surrounding menstruation gives rise to dangers, for example, it can result in early and unwanted pregnancy [18]. Education has an important role in overcoming these barriers [1].

Access to hygiene materials and supplies, and health services is important in enabling optimal menstrual hygiene management [1,9,13]. Menstrual product affordability is a problem many countries face, particularly individuals from lower socioeconomic groups [9]. Individuals who menstruate in many LMIC use cloth, mud, paper, sand or bark for the absorption of menstrual substances [9,10]. In LMIC, the inability to access hygiene materials can result in the use of unhygienic materials like rags, which can be associated with an elevated risk of genitourinary tract infections [19,20,21]. Embarrassment around having to dry clothes in the sun and thus not in secrecy, and by the lack of coal or electricity to heat an iron further contributes to unhygienic menstrual health management [21]. In order to obtain sanitary pads, some adolescent girls in Kenya and Tanzania have engaged in transactional sex [22,23]. This contributes to an increased risk of sexually transmitted infections, school dropout and pregnancy [24,25]. In a study of school girls in India, 54% attended school during menses [26]. Adolescents in the UK and Australia are missing school as a result of a lack of access to appropriate menstrual materials [27,28].

Around the world, 2.4 billion have inadequate access to sanitation, and 663 million people do not have access to safe water [29]. Inability to access appropriate hygiene supplies can result in revealing menstrual leakage, stains and/or odours [30,31]. This can reduce concentration and willingness to participate, and lead to distraction and absenteeism [32,33]. Absenteeism is further contributed to by lack of privacy. For example, girls in Malawi have been reported to be more than two

times more likely to be absent during menstruation than girls attending schools where more privacy was available [34]. Poor access to health services, including those that can diagnose and treat individuals with menstrual discomfort or disorders, can contribute to the suffering and reduced quality of life of individuals who menstruate [9,13]. In HIC, pain or discomfort during menstruation is often required to be endured in order to allow maintained participation in work and other activities. This is less prevalent in LMIC, with the more common consequence of menses being missed due to missing education or social participation [13].

It is therefore important that appropriate materials, supplies and services are affordable, available and safe for individuals who menstruate [1]. For the safe and dignified management of menstrual hygiene, individuals who menstruate should have access to affordable menstrual management materials that are clean, usable, culturally-appropriate and effective in collecting or absorbing blood [9,13]. Furthermore, water, sanitation and hygiene services to enable washing, the change of menstrual materials and the cleaning and/or disposal of used materials is required [35]. This includes undergarments to hold materials to the body; access to soap, water and laundry facilities; sterilising practices including boiling or ironing; and drying means, such as clothes lines [1,9]. For ideal menstrual hygiene management, access to available, functional and safe health services, including health professionals and facilities for the sanitation, washing, and hygienic disposal of materials, is required. Individuals who menstruate should have access to private facilities that enable them to change menstrual hygiene materials as frequently as necessary throughout menses. Such facilities should include materials like water and soap for washing as needed [1].

An additional way for individuals who menstruate to obtain further knowledge is through the inclusion of accurate product descriptions and relevant information in packages. The inclusion of information regarding the relationship between tampon use and toxic shock syndrome in tampon packs has contributed to the decline in menstrual toxic shock syndrome [36]. The Food and Drug Administration also recognises the relationship between menstrual hygiene material packaging, and misinformation and shame. This is reflected in their decision to alter the label of a tampon with absorbency of 6g or less from “junior” to “light”, a move that acknowledges that this degree of absorbency may be appropriate for women of any reproductive age [37].

A means of disposal of menstrual management materials that have been used, including disposal facilities located in toilet cubicles in appropriate locations like households, schools and health facilities, can be important [1]. Additionally, better lighting in latrines and mirrors to check for stains where possible is also beneficial [33]. In high income countries, there has been less reported emphasis on the effects of resource deficits and physical environments [13]. Accessibility to facilities can be enhanced by avoiding terminology like “menstruation clubs” or “menstruation rooms” which can be associated with stigma [1]. Overall, supporting hygiene should function to minimise the risk of harm, including infections, and

maximise social, physical and emotional safety by providing sufficient private services, including the freedom from unwanted disturbance or observation [1,9,13].

Contributions to Barriers

Traditional practices, norms, and cultural beliefs can contribute to the marginalisation and inhibition of individuals who menstruate, serving as barriers that prevent optimal menstrual cycle management [1,9,13]. Cultural and social norms often discourage the open discussion of the menstrual cycle [9].

Around the world, generations of individuals who menstruate have internalised shame, secrecy and taboos surrounding the natural process of the menstrual cycle resulting in behaviour regulation [1]. In LMIC and HIC, this has been shown to impair confidence when engaging in activities during menses [9,13]. Failure to uphold menstrual etiquette standards by hiding menses can be associated with shame [13]. This can lead to relevant and important health information concerning the menstrual cycle to be inaccurate, incomplete and/or untimely [7,38,39,40]. In many societies, stigma that surrounds menstrual health can lead to stress, shame, and barriers to menstrual information or supplies. Distress can also be associated with discrimination, exclusion, violence or coercion that can accompany menstruation [9,35]. A study called the 'Tampon Experiment' found that an informed research participant dropping a tampon (i.e. an obvious, visible reminder of menstruation) on the floor was viewed more negatively by men and women than the dropping of a hair clip (i.e. a feminine item not associated with bodily functions) [41].

In certain settings, individuals who menstruate can be regarded as impure, resulting in their separation from cis-men, and them being banned from utilising the same water sources so as not to contaminate them [38,42]. This separation can occur through the use of menstrual huts and can exclude individuals who menstruate from social interactions during menses [43]. This can result in those who menstruate internalising stigma, and contributing to feeling shame and dirty when menstruating [44,45]. It can also endanger the jobs and career security of individuals who menstruate [9,13]. A cross-sectional study of 387 school girls in India reported only 37% of them were aware of the existence of menstruation prior to their experience of menarche. This absence of awareness has been associated with the first menstrual cycle being a frightening experience [46].

In the UK, "menstrual etiquette" exists as a result of stigmatisation of menstruation, and gives rise to behavioural expectations of individuals who menstruate, especially the concealment of menstrual status [47]. Difficulties that arise from this effort to contain menstrual fluid include mental burden, bother and distress. Inadequate knowledge on menstrual hygiene management and social support in HIC has been shown to lead to a lack of confidence to engage in social and professional activities and shame, and can also alter intimate relationships [13]. In LMIC and HIC, social support in the form of mothers, friends and healthcare professionals have been shown to have power in influencing the experience of the menstrual cycle [9,13]. Education on menstrual hygiene management supports confidence, wellbeing and positive menstrual experiences [1,9].

Menstrual health must be considered in decision-making to ensure policies, strategies and programmes support a safe and positive environment for menstrual cycle management [9,13]. Geographical, cultural and financial accessibility to products, services and information is an additional consideration that is paramount [1]. “Period poverty”, or lack of access to menstrual materials as a result of financial constraints, has been reported in HIC like the UK [48]. In HIC, limited access to resources including menstrual materials, supplies and facilities was contributed to by lack of public attention and policy displayed towards the menstrual health of individuals of low-income status, or who identified as trans-men or non-binary. This has contributed to a reduction in participation in activities during menses [13].

The removal of Australia’s Goods and Services Tax on menstrual hygiene products is an example of a policy that is working towards addressing inequitable financial penalties that target individuals who menstruate [49]. Furthermore, free menstrual pads are available in public schools in Victoria, Queensland, New South Wales and South Australia [50]. Campaigns in the UK exist to end menstrual shame and period poverty by 2025 nationally, and by 2030 globally [51]. However, focusing upon the provision of materials and supplies alone without appropriate attention displayed towards social stigma and education associated with the menstrual cycle will unlikely be sufficient in improving menstrual health hygiene [52]. In Kenya, a National Menstrual Hygiene Management Policy was approved in 2019, spotlighting menstrual cycle issues as a human rights issue and pushing its discussion more mainstream in the development of health interventions [53]. In the last few years, Kenya has also moved to abolish the value-added tax on menstrual hygiene products [35].

While education and menstrual product provision has occurred to varying extents in LMIC, limited attention has been directed towards social stigma and cultural restrictions [9]. Initiatives should address the menstrual cycle at the individual, familial, community, and societal levels in order to work towards contributing to the dismantling of the educational, sociocultural and accessibility barriers identified [1,9,13]. Evaluation of the effectiveness of the policy and practice should occur. Resources and support may be required from a variety of sources, such as family members, care-givers, the community, educational institutions and the government, to equip individuals to confidently care for their body throughout the menstrual cycle [1]. The training standards and practices of health professionals and educators should be high and evaluated [13].

Increasingly, concerns surrounding the sustainability of solutions targeted at unmet menstrual health and hygiene needs are being considered [54]. There exists a tension between trying to enable access to menstrual hygiene materials and supplies, and trying to do so in a way that is sustainable and environmentally friendly. Reusable and compostable menstrual hygiene materials reduce ongoing costs and remove the consideration of sanitary disposal, and thus the encouragement of disposable waste [1,54]. Such options include menstrual cups,

and absorbent underwear [54]. Consideration of the convenience and appropriateness of solutions targeted at improving sustainability is important. For example, the provision of education booklets and menstrual cups in Nepal did not affect school attendance, with most girls reporting the cups to be difficult or inconvenient to use [55]. Hence, when addressing any issues surrounding menstrual health and hygiene, consideration of preferences and cultural acceptability, including religious beliefs to ensure cultural sensitivity, is paramount [1,9,13].

Physical and Mental Health Throughout the Menstrual Cycle

Physiological and pathophysiological menstrual cycles can be associated with physical and psychological symptoms that can have significant effects on the quality of life of individuals who menstruate [1]. In a study of Russian girls aged 15-17 years old, 77% experienced menstrual problems such as heavy menstrual bleeding or dysmenorrhoea [56]. In LMIC, many women lack awareness of whether their menstrual cycle is abnormal [57]. Being able to distinguish between physiological and pathophysiological menstrual health is important in maximising the ability for individuals who menstruate to progress through the menstrual cycle safely and with dignity [1].

Premenstrual syndrome (PMS) has been shown to occur in 95% of women of reproductive age, and can manifest as recurrent physical and/or psychological symptoms throughout the luteal phase of the menstrual cycle and some, or all, of menses. Such symptoms can be: psychological, including anxiety, depression and irritability; and/or physical, resulting in headaches, abdominal bloating and cramps, and breast tenderness. Symptoms of PMS can vary in severity, with premenstrual dysphoric disorder existing at the severe end of the PMS spectrum [58]. The effect on daily functioning and distress associated with PMS distinguishes it from physiological premenstrual symptoms [59].

Dysmenorrhoea affects many individuals around the world, with a reported prevalence of 59% [60]. In Iran, primary dysmenorrhoea has been found to have a prevalence of 73% [62]. Primary dysmenorrhoea can contribute to absence from education and employment, reduced social participation, sleep disturbances, altered pain perception, and overall decreases quality of life [62,63,64]. Causes of secondary dysmenorrhoea, including endometriosis, can also significantly affect the quality of life of individuals who menstruate [65]. Endometriosis is a common but underdiagnosed gynaecological condition that can cause dysmenorrhoea, dyspareunia, chronic pelvic pain, and infertility [66,67]. Endometriosis is also associated with psychiatric co-morbidities and mental health-related distress related to feelings of worthlessness, hopelessness and loss, and alterations of body image [68].

Abnormal uterine bleeding is more commonly observed in women on the older or younger ends of the reproductive spectrum, and can result from several non-

pathological causes [61, 69]. While abnormal uterine bleeding can be benign and is not always associated with disease, it has great effects on the quality of life of individuals who menstruate [61]. It is associated with complications including iron deficiency anaemia, which in severe cases, can be life threatening [70,71]. Various interventions exist to reduce menstrual blood loss, including the COCP, levonorgestrel-releasing intrauterine systems, antifibrinolytics and hysterectomies [71,72]. The COCP has several uses in menstrual disorders given its effects on thinning the endometrium, resulting in reduced severity of abnormal uterine bleeding and dysmenorrhoea, and thus improved quality of life [73]. The COCP has also been used in the management of pain associated with endometriosis [74]. The direct effects of hormonal contraceptives on mental health are variable. In certain individuals, they are associated with negative effects on mood; however, evidence is inconsistent. In other populations, including those experiencing premenstrual dysphoric disorder, they may improve mental health. Nevertheless, the indirect effects of hormonal contraceptives on mental health, including alleviating physical symptoms associated with the menstrual cycle and enabling personal control over fertility, promote the mental and physical health and wellbeing of women [75].

Hormonal disorders are one of the most common causes of abnormal uterine bleeding, including disorders like hypothyroidism, obesity, pregnancy-related bleeding, and polycystic ovarian syndrome (PCOS) [76]. PCOS is the most common endocrine disorder to occur during the reproductive lifespan of women, and can result in menstrual irregularity, symptoms of androgen excess including hirsutism, alopecia and acne [77]. Long term consequences of PCOS include metabolic syndrome, increased risk of ovarian, breast and endometrial cancer, impaired reproductive health and psychological dysfunction [77,78,79,80]. In Sweden, women with PCOS were found to have an overall 50% increased odds of diagnosis with a psychiatric disorder [81]. PCOS has also been shown to be associated with an increased prevalence of eating disorders, anxiety and depression [82,83,84].

The effects of menstruation on the physical and mental health of individuals who menstruate has given rise to discussion of the possible benefits of menstrual leave, a process that entitles employees to time off during menses [85]. 23% of participants in a United States study thought a menstrual leave policy would only have positive effects for women in the workplace [86]. Menstrual leave has the potential to encourage the open discussion of menstruation, which would work towards normalising it, and therefore could contribute to a reduction in associated stigma [85]. By providing individuals who menstruate the opportunity to appropriately manage their symptoms and/ or access healthcare, menstrual leave can contribute to improved menstrual health [86]. However, menstrual leave could have negative effects on individuals who menstruate if sexist attitudes and gender discrimination are not also addressed [85]. Menstrual leave policies are present in several countries including Japan, Zambia and Spain [87,88,89]. Overall, further research on the effects of such policy changes on individuals who menstruate is required to better understand the extent of the pros or cons it may be associated with [85].

Family Planning

According to WHO, family planning 'allows people to attain the desired number of children, if any, and to determine the suitable spacing of pregnancies' by using safe and effective methods [90]. Family planning enables people to make informed choices and to have control of their sexual and reproductive health which can empower people with uterus to pursue education and play active roles in non-family organisations which can feed back into familial, societal and economic development [91]. There are two facets to family planning: contraceptive methods and the treatment of infertility [90].

Contraceptive Methods

Barrier Contraceptives

Diaphragm

The diaphragm barriers the uterus from sperm following ejaculation, providing an autonomous, immediately-reversible, and low-risk method of contraception [92]. The positioning of the diaphragm, which can be done through suction, or adherence to the cervical surface, and its reusability is dependent on the manufacturer; however, diaphragms are standardly used with a spermicidal agent, such as a jelly or cream [93]. Diaphragms are becoming progressively limited in acceptance, primarily due to the availability of more effective contraceptives [92].

External Condom

The external condom is a barrier contraceptive that encases the penis to collect sexual fluids, thereby providing contraception in conjunction with protection from sexually transmitted infections (STIs). Due to its two-fold function, as well as ease of application, the external condom is one of the most commonly used contraception methods worldwide [94].

Internal Condom

The internal condom, commonly referred to in literature as the 'female condom' (a recognisably conformational term), provides contraception and protection against STIs as a vaginally-inserted nitrile pouch that minimises transmission of sexual fluids during sexual activity between partners. Due to the high costs and low accessibility of internal condoms as a single-use contraceptive, alternative methods of contraception are used preferentially [95].

Short-acting Hormonal Contraceptives

Combined Oral Contraceptive Pill

The COCP is an oral contraceptive composed of low doses of oestrogen and progesterone. Globally, the COCP is the second most commonly used form of reversible contraception and has the widest geographic distribution of all modern methods [96]. The combination of oestrogen and

progesterone has a four-fold effect: inhibition of ovulation, thickening of cervical mucus, thinning of endometrial lining and reduction of endometrial receptivity to implantation [97].

New formulations of the COCP have seen a decrease in the dose of oestrogen, allowing for reduced oestrogenic side-effects such as nausea, bloating and breast tenderness; while maintaining high levels of efficacy [97]. However, the use of COCPs is contraindicated in numerous patient groups; these are patients who are pregnant, smoke, breastfeed or chestfeed, and/or have oestrogen dependent tumours.

Emergency Contraceptive Pill

Emergency Contraceptive (EC) pills are widely used following unprotected sexual intercourse to prevent unintended pregnancies. Functionally, available EC pills are comprised of either levonorgestrel, a synthetic progesterone - otherwise known as progestin - that inhibits follicular development; or ulipristal acetate, a selective progesterone receptor modulator that acts as a partial agonist to delay, or inhibit, ovulation [98]. Both function as effective emergency contraceptives; however, ulipristal acetate EC pills are more efficacious as emergency contraception if required at least 72 hours following vaginally penetrative intercourse [99].

Progesterone-only Pill

The progesterone-only pill (POP) is an oral contraceptive composed only of the hormone progesterone. POPs often offer a suitable alternative when oestrogens found in the combined hormone pills are contraindicated, or when COCP is not tolerated due to side effects [100]. The progesterone-only pill is useful for those needing a reliable form of contraception within a short period, as it is effective after 48 hours when 'quick started'. The function of progesterone-only pills is threefold: thickening of cervical mucus to impede sperm penetration, prevention of ovulation, and endometrial thinning which reduces implantation rate [100].

Long-acting Reversible Contraceptives (LARCs)

Contraceptive Implant (Implanon)

The contraceptive implants are single-rodged, subdermal implantation in the upper arm, which provides sustained and reversible contraception [101]. Mechanistically, contraceptive implants release progestin to have a three-fold effect: deregulating ovulation; thickening cervical mucus; and thinning the individual's endometrial lining, thereby preventing implantation [102].

Contraceptive Injection

The contraceptive injection is an intramuscular injection of medroxyprogesterone acetate, a progestin, which acts similarly to Implanon. Contraceptive injections are provided every three months for

continuous contraception, with pregnancy-risk increased if an injection is not provided after 14 weeks [103].

Contraceptive Patch

The transdermal contraceptive patch delivers norelgestromin, the primary active metabolite of norgestimate, and ethinylestradiol (EE), a synthetic oestrogen, into the systemic circulation, thus providing contraception through inhibition of follicular development and ovulation [104]. Relative to other contraceptives, the patch's weekly dosing schedule leads to increased compliance, relative to oral regimens, while its administration design provides readily-reversible contraception, compared to other long-lasting hormonal contraceptives, such as the contraceptive implant [105,106].

Contraceptive Vaginal Ring

The contraceptive vaginal ring is composed of ethinyl vinyl acetate that releases EE and etonogestrel, the biologically active metabolite of desogestrel, that synergistically inhibits follicular development and ovulation [107]. The contraceptive vaginal ring has its advantages as it avoids first-pass metabolism, maintains constant serum steroid levels, and only requires a once-a-month insertion regimen [108].

Intrauterine Device and Intrauterine System

The Intrauterine Device (IUD) is a T-shaped device that is inserted into the uterus and locally provides contraception. IUDs are classified mechanistically as either copper IUDs, which secrete small concentrations of copper into the uterus to impair sperm functionality; or hormonal IUDs, often referenced as an Intrauterine System (IUS), that secrete levonorgestrel [109]. Functionally, IUDs and IUSs inhibit essential reproductive processes including sperm transportation and survival, fertilisation capacity, and endometrial receptivity to implantation, thereby providing effective contraception for individuals who menstruate [110]. In addition to their role as a long-term contraceptive, copper IUDs have been demonstrated as the most effective form of emergency contraceptive - capable of preventing upto 99% of pregnancies [111]. However, copper IUDs remain underutilised as a form of emergency contraception due to lack of public knowledge and a shortage of skilled providers [112].

Surgical Contraceptives

Hysterectomy

Hysterectomy is an irreversible surgical sterilisation option available to individuals who possess a uterus. Broadly, a total hysterectomy involves the removal of the uterus and cervix, with removal of the adnexae (ovaries and fallopian tubes) determined on a case-by-case basis. Alternatively, a subtotal, or supracervical, hysterectomy would not remove the cervix [113]. Complications of hysterectomies include infections, venous

thromboembolism, genitourinary and gastrointestinal tract injury, bleeding, nerve injury, and/or vaginal cuff dehiscence, which risks expulsion of abdominal and pelvic contents through the vaginal opening [114].

Tubal Ligation

Tubal ligation is a permanent surgical sterilisation technique whereby the fallopian tubes are occluded, blocking sperm mobilisation to the ovaries, while simultaneously inhibiting ovarian transport to the uterus, thus preventing fertilisation [115]. Extensive consultation prior to the procedure is essential, given its permanency; in addition to potential side effects, such as menstrual changes or disorders, as ligation-induced damage of the utero-ovarian artery would lead to altered hormonal function [116]. *In vitro* fertilisation (IVF) or surgical tubal anastomosis are options for individuals who have undergone tubal ligation and wish to reproduce again [117].

Vasectomy

Vasectomy is a reversible surgical sterilisation wherein the vas deferens are ligated and resected, thereby preventing sperm mobilisation into the urethra, resulting in its absence in ejaculated semen [118]. Vasectomies can be reversed through vasoepididymostomy or vasovasostomy, should vasectomised individuals seek to reproduce again. Alternatively, because these vasal repair procedures are formed by only a few urologists, IVF with intracytoplasmic sperm injection is an alternative for vasectomised individuals wishing to conceive a child [119].

Treatments for Infertility

Infertility is the inability of a couple to conceive despite regular unprotected intercourse for at least a year. This is a global issue that has severe and sometimes devastating psychological and emotional consequences for couples [120]. Locally, about 16% of Australian couples have problems with fertility [121]. Worldwide over 186 million people experience infertility with a majority residing in developing countries [122]. Regions including South Asia, sub-Saharan Africa, the Middle East and North Africa, Central and Eastern Europe and Central Asia have some of the highest rates of infertility affecting about 30% of these populations [123]. Infertility has a plethora of causes. These factors differ between countries due to variations in the background prevalence of STIs and ages of populations amongst others [124]. The rates of infertility are on the rise due to factors such as increased age at first pregnancy and first attempt of conception, increasing body mass index, poor nutrition, smoking, excessive alcohol and drug use, and environmental pollutants [125]. Infertility in people with penises accounts for more than half of all reported cases of global childlessness, and remains a social burden for people with uteruses [122].

The impact of infertility is far-reaching. Both parties in a couple can be affected by depressive symptoms and distress. Infertility can tax relationships, with higher rates of divorce as well as social isolation and stigmatisation of infertile individuals [126]. It is important to note that the experience of infertility is significantly different between developed and developing countries. In developing

countries, especially those that are pronatalist such as Japan, fertility can be considered as being central to the body and identity of gestational individuals, with rates of child-free individuals being lower in these countries [120,127]. This influences self-perception and scrutiny from families and society, resulting in higher distress due to infertility in developing countries. In addition, gestational individuals who are childless are more likely to become victims to domestic abuse [128].

Infertility has severe consequences and is a significant problem worldwide. Treatments depend on the factors affecting infertility and can range from hormonal therapy, methods to improve sperm delivery and pharmacological therapy to surgery. Changes in lifestyle such as healthy diets, exercise, avoiding smoking and regulation of environmental and occupational pollutants can improve fertility for all individuals [129]. In developing countries, early detection and adequate treatment of STIs can be especially helpful [130]. Other treatments, including for those with unexplained infertility are IVF, donor insemination and oocyte donation [131].

Prevention of infertility is also an important health policy consideration. With more people postponing first births, difficulty conceiving and producing additional offspring is becoming an increasing problem [132]. The main reasons for this delay are evidenced to be an increase in effective contraception, higher women's education and labour market participation, value changes, gender equity, unideal housing conditions, economic uncertainty and the absence of supportive family policies. The more massive postponements are due to conflicts between gestational individuals obtaining further education, building their careers and the optimal biological period [133]. Social policy incentives aiming to reduce incompatibility between work and mother roles are effective and lead to earlier first births. These include facilitating access to maternity and paternity leaves [134]; high-quality, low-cost childcare [135]; and affordable housing [136].

The culture and attitudes of society and workplaces on family also shape the timing of childbearing [137]. Policies cannot be considered in exclusion. It should be recognised that they are a component, although vital, of a wider message sent to individuals about having and sustaining parenthood in the longer term.

IVF

IVF is the most common form of assisted reproduction technology (ART). This is a procedure in which an oocyte is fertilised outside the body in a specialised laboratory after which the embryo (fertilised oocyte) is transferred into a uterus. Access to IVF differs greatly based on socio-economic status, remoteness and disadvantage in Australia, with people with uteruses in regional and remote areas having 12% lower access to ART [138]. This is despite Australia having supportive funding for ART through national health insurance schemes (i.e., Medicare) resulting in one of the highest ART uptake rates in the world [139]. Out-of-pocket cost being approximately \$3000-\$4000 for a fresh embryo transfer cycle and \$1500-\$2000 for a frozen embryo transfer cycle [140]. These costs multiply when couples need to undergo multiple cycles to achieve a pregnancy. Globally, the

greatest disparity in access to infertility care between developing and developed countries is found in availability and access to IVF and intracytoplasmic sperm injections [141]. Further, in developing countries, there is less impetus to improve accessibility to ART as infertility may be seen as a 'solution to overpopulation' or a 'low-priority issue' [122].

Adoption

ART can be an expensive and time-consuming treatment with a success rate between 50.5% and 88.1% even after six cycles in developed countries like Australia [142]. Therefore, many turn to adoption as an alternative process which decreases both treatment costs and the psychological impact of infertility on families [143]. A child who is adopted is accepted into a family by one or more adults. The adoptive parents are considered legal parents.

Acceptance of adoption increases with age, duration of marriage and number of previous referrals for infertility cure [144]. Adoption is often highlighted to couples as an alternative method for IVF which synergistically improves their own welfare, as well as the adopted children's [145]. Therefore, it is unsurprising that adoption is often perceived as a response to infertility instead of originating from a desire to provide a home for a child. Historically, clinics advised couples to adopt children if they are unable to conceive after a few years [146]. Reviews of qualitative studies have highlighted that this is widely condemned by adoptive parents and resented by adopted adults as a 'betrayal of trust by those who had a duty to care and protect' [147]. Distress due to infertility and/or treatment can affect the adoption process and those adopted [148]. Therefore, it is important for adoption agencies to assist prospective parents in preparation for an adoption and in dealing with grief due to infertility in addition to a formal assessment process [146]. Some agencies address this by requiring parent(s) to spend a year coping with infertility grief before deciding on adoption [149]. This, however, must be balanced with accessibility to adoption. In Australia, the average waiting time for adoption is over 3 years. In addition, adoption rates have dropped by 63% in the last 25 years [150].

The process of adoption can not only be difficult for the adoptive parents but also be detrimental to the children being adopted. Due to the waiting time, children often have to live with one or multiple temporary caregivers. Children who experience impermanent care are three times more likely to suffer from drug and alcohol addiction, four times more at risk of diabetes and five times more at risk of heart disease. Furthermore, they are more likely to experience homelessness, mental health problems and have difficulty finding stable employment [150]. Whilst adoption laws must be strict, it must be recognised that adoption is a time-sensitive matter for all those involved. Therefore, the process of adoption must be as efficient and thorough as possible.

Surrogacy

Surrogacy defines a gestational individual becoming pregnant and giving birth to a child with the intention of giving away said child to another person or couple [151]. Surrogacy in Australia is regulated. Intended parents must not be able to conceive or carry a baby themselves. Hence, the primary indication for surrogacy is a

congenital or acquired absence of a functioning uterus. Medical disease of the uterus (e.g., cervical cancer requiring hysterectomy) and/or severe medical conditions which may be life-threatening during pregnancy for a gestational individual, or the biological inability to conceive or bear a child (e.g., for same-sex couples) are some other indications [152].

The surrogacy arrangement is not enforceable except for when the surrogate is recovering prescribed costs. Commercial surrogacy is illegal in all Australian states and so must be altruistic (i.e., unpaid). The baby, when born, is initially registered under the names of the surrogate and their partner, after which the intended parents apply to the Court for a Parentage Order [153]. Additionally, in ACT, NSW and Queensland, it is an offence for a resident to organise commercial surrogacy overseas [154]. These regulations are due to concerns for the welfare and rights of the surrogate mother and the child [155]. However, in a study focusing on members of two Australian parenting support forums, only 9% of Australian intended parents (via surrogacy) were deterred by laws criminalising commercial surrogacy. Moreover, most respondents considered or used overseas compensated arrangements [156].

Ethical dilemmas around surrogacy are highly debated. Most studies reporting on surrogacy are of low methodological quality and do not consider the growing industry of commercial cross-country surrogacy, especially in developing countries. According to these, the perinatal outcomes of babies born through surrogacy and the psychological impact are comparable to those born through IVF [152]. However, more research of high-quality, better representation and with long-term follow-up is needed to confidently comment on the impact of surrogacy on surrogate mothers, children and intended parents.

Barriers to Access

A broad range of barriers prevent gestational individuals from obtaining contraceptives and/or utilising them effectively and consistently [156,157]. These barriers can be broken down into three main categories: cognitive accessibility barriers, psychosocial accessibility barriers and geographic accessibility barriers [157]. The unique social, political and geographical contexts of each country means that each is affected by a unique/different set of barriers. However, these barriers can generally be grouped into those affecting developing countries (LMIC), and those affecting developed (high-income) countries [156,157].

Developing Countries

Cognitive accessibility and psychosocial accessibility barriers have been identified as the leading factors impeding contraceptive access in LMIC [157]. The effects of these barriers is further compounded by geographic accessibility and systematic barriers [157].

Cognitive accessibility barriers include inadequate sexual health education, and lack of awareness regarding available sexual health services [157]. Inadequate education results in poor understanding of contraceptive options and how they

should be used; while fostering misconceptions about the effectiveness and side-effects of the contraceptive methods [157, 158,159]. Additionally, a lack of sexual health services means that these individuals are not able to seek professional advice when they encounter any questions or health problems [160]. This in turn can lead to greater risk of STIs and higher pregnancy rates [161]. Surveys have reported that the majority of the public in LMICs suggest a need for more education about contraceptives, available sexual and reproductive health (SRH) services and how to discuss SRH issues. Surveys have also indicated that individuals in these countries may find it difficult to find SRH information in their language on the internet, further adding onto this set of barriers [157].

Psychosocial accessibility barriers include feelings of shame caused by negative cultural stereotypes, negative attitudes towards premarital sexual intercourse, along with feared lack of confidentiality in services [157]. Studies into adolescent contraceptive use have found that women in numerous LMICs are under pressure to conceive and bear children soon after marriage, with contraception only becoming socially acceptable after their first child is conceived [162,163]. This is further exacerbated by cultural stereotypes which imply that all women should prioritise childbearing and child caring over all other roles, including schooling [164]. These mindsets, along with stigma surrounding premarital sex and unintended pregnancies prevents regular contraceptive use by individuals not in stable or long-term relationships [164]. A study in Central Mexico further built on these barriers, reporting that a woman may be negatively perceived for simply proposing the use of an external condom or carrying one [165]. Together, this group of barriers highlights the significant negative societal perceptions towards individuals seeking contraceptive services; resulting in poor rates of contraceptive use even when easily accessible.

Systemic barriers such as poor quality of sexual and reproductive health services, and healthcare provider stigma create a further barrier in the access to contraceptives in LMICs [157,159]. Analysis of South African public health clinics have shown that these clinics are often understaffed and overloaded with patients - creating long waiting times. This likely discourages individuals from seeking comprehensive contraceptive and family planning information, while limiting healthcare providers from communicating effectively with patients [166]. Another quantitative study conducted in both urban and rural settings found that counselling is often limited to a few contraceptive methods (usually one or two), instead of the entire methods available at the facility [167]. In cases where patients may present to these clinics for professional advice, they may be prevented from equitable access to contraceptives due to laws and policies preventing their provision to unmarried adolescents or to those under a certain age [162,163]. Even where there are no legal restrictions, health workers in many places refuse to provide unmarried individuals with contraceptive information and services because they do not approve of premarital sexual activity [162,163]. Additionally, the contraceptive advice provided by health professionals is often substandard or biased [167].

Overall, these barriers result in major shortfalls in the access to contraceptives by individuals living within these low to middle income countries. It has been shown that poor contraception access leads to early unwanted pregnancies, with tragic consequences to those living in LMIC [160]. An estimated sixteen million adolescents (aged 16 - 19) give birth globally every year, with 95% of these occurring in LMIC [160]. Complications from pregnancy and childbirth are the leading cause of death for women aged 15 - 19 in LMICs [160]. Births to girls under age fifteen pose especially high health risks for mother and infants [168]. In some cases, unintended and unwanted pregnancies as a result of inadequate contraceptive use result in individuals choosing abortion; however, many of these countries also face barriers in terms of legally or logistically restricted barriers, resulting in unsafe abortions [169]. Improving contraceptive education and access has been identified as a key strategy in improving health outcomes in LMICs [160]. This can be achieved through interventions such as investment in digital health technologies [161]. Digital health technologies have been shown to help support and enhance access to contraception and family planning services in these regions, helping address numerous cognitive and systemic barriers [170,171].

Developed Countries

Cognitive accessibility and systemic barriers have been identified as the leading factors limiting contraceptive access in developed countries and HIC [156,172].

Cognitive accessibility barriers include inadequate contraception education, along with negative experiences with contraception and health services [172]. A strong focus on abstinence-only sexual education in nations such as the United States has been linked to inadequate contraceptive education, along with misperceptions regarding the effectiveness of contraceptives [173]. This lack of education leads to poor contraception knowledge in healthcare providers, limiting their ability to provide effective contraceptive counselling. Numerous studies have studied the effect of inadequate education on the quality of contraceptive health services, reporting clinicians are often uncertain about the risks and benefits of IUDs, while lacking sufficient knowledge about patient selection and contraindications for all of the forms of contraception [174,175]. Consequently, this leads to inadequate discussions about contraceptive options with patients; which can leave patients feeling 'unheard' or stuck with contraceptive options which result in unbearable side effects [156,172]. A survey of middle-aged women in Australia found that a large percentage of women have been dissatisfied with the information provided by their general practitioners, commonly reporting that they received minimal warnings about the potential side-effects and risks and their health practitioners did not explore all possible contraceptive options with them [172].

Systemic barriers such as unfavourable laws, high-costs and access issues continue to be significant barriers within developed countries [156]. Unfavourable legal rulings and restrictive legislative measures can impede access to contraception, while interfering with a healthcare professional's ability to counsel their patients about contraception [156]. This is particularly prevalent in the United States, where twenty states currently restrict some minors' ability to consent to

contraceptive services [156]. Such policies prevent adolescents and young adults from freely accessing contraceptives. Contraception access is further limited in developed countries through high-costs; with an Australian survey reporting that a large portion of Australian women felt the costs of contraception, or the costs associated with visit to a healthcare professional, prevented or deterred them from accessing contraception [172]. High-costs are particularly harmful to adolescents, creating a major economic barrier in the access to contraceptives [175]. Facilitating affordable access to contraceptives would not only improve health but also would reduce health care costs, with cost-estimates reporting that each dollar spent on publicly funded contraceptive services would save the U.S. health care system nearly \$6 [176]. It is also important to note that some institutions continue to refuse equitable access to contraceptives to all individuals, as a result of personal beliefs conflicting with the patient's requests [156]. This further highlights the importance of investment in government-run or publicly funded sexual health clinics which provide an independent and reliable service to all individuals seeking contraceptives [156].

Overall, these barriers highlight the need for a multifaceted approach to improve contraceptive access within high-income countries. Further research is required to determine the applicability and effectiveness of implementing each interventional option [157].

Mental Health and Stigma

In developing countries such as Tanzania, there are other barriers to family planning services, such as religious beliefs and primary decision makers being men [177]. This results in unintended pregnancies, which have grave mental health effects as well. Unintended pregnancies can exacerbate pre-existing parental issues such intimate partner violence as well as cause anxiety and depression [178]. According to an Australian study, mothers who have experienced unwanted pregnancies have reported lower levels of happiness and higher levels of depression [177]. This leads to projection of their mental health issues on their children in the form of physical abuse which severely affects mother-child relationships [177]. Surveys have revealed that a significant number of sexually active individuals with serious psychiatric conditions do not have basic knowledge of contraception. This is largely due to family planning counselling being a separate unit from mental health counselling. Research has shown that family planning counselling in psychiatric facilities have received better education about contraception and have continued to practise safe methods of contraception [179].

Infertility has significant effects on mental health. Not being able to bear children causes emotional and psychological distress. Unmet expectations of parenting due to infertility can cause overwhelming feelings of guilt, grief, shame and anger [180]. Medically assisted reproduction (MAR) comes with its own set of emotional tribulations. People reported infertility-related stress, anxiety and sexual concerns [180]. In developing countries, the fear and experience of threat is quite different; in a study carried out in South Africa, women were concerned about abandonment. As most of them consider fertility to be the primary function of womanhood, they often feel defenceless against these threats [181]. They are often subject to

stigma and ridicule from family and friends. Even if they received support from their husbands, the shared burden of infertility seemed to create barriers when it came to initiating conversations around it. This stigma causes women to cope in different ways; in Bangladesh, some pretend to not wish to conceive, while some feign miscarriages to maintain the appearance of fertility [181].

The success of infertility treatment is shown to be influenced by psychological factors creating a vicious cycle. Studies of people with uteruses pursuing infertility treatment show that distress is associated with lower pregnancy rates [112]. Cognitive behavioural group psychotherapy (CBT) and support groups decrease fertility stress in terms of social, sexual and marital concerns. CBT was also shown to be more effective than fluoxetine in resolving infertility stress [113]. However, more research is needed to evaluate the effectiveness of CBT on fertility rates. Moreover, pharmacotherapy is an important option for people who develop depression due to infertility or during the treatment journey. However, many people with uteruses avoid pharmacological interventions for the fear of these affecting prospective pregnancies [114]. There is no evidence that commonly used antidepressants negatively affect fertility. In addition, several antidepressants may be safely used during pregnancy, Therefore, it is important to clearly counsel couples experiencing infertility and undergoing ART about available treatments and their effects.

Vulnerable Populations

There are certain populations who can be disproportionately affected by issues relating to menstrual health and hygiene and family planning. These people require additional considerations to the ones mentioned elsewhere.

Aboriginal and Torres Strait Islander Peoples

Menstrual Health and Hygiene

Menstrual hygiene management is a challenge for many girls and women of Aboriginal or Torres Strait Islander origin in urban, regional and remote settings [14]. Research has shown that menstrual hygiene management hurdles hinder girls in multiple rural and remote Indigenous communities. Such hurdles include inadequate menstrual hygiene supplies, facilities (including lack of privacy), and accessible and functioning toilets and disposal facilities, insufficient soap, and running water, and can result in school being missed [182,183]. Other barriers include shame which can limit discussion and the purchase of materials by contributing to the perceived need for secrecy around purchasing menstrual hygiene materials. Additional barriers to access include high financial cost and a lack of knowledge on the menstrual cycle and its management [182]. In many Aboriginal and Torres Strait Islander cultures, the menstrual cycle is considered private “women’s business” resulting in it being a particularly sensitive topic to discuss. This secrecy may contribute to individuals who menstruate being unable to live every day of the month in comfort and without shame [7]. Thus it is crucial to honour cultural considerations when working to ensure maximal understanding of menstrual hygiene management. Other barriers that have been identified include

challenges with storing and transporting products due to housing circumstances, which include living across multiple residences, overcrowded housing, and the absence of privacy for storage of personal items [14].

When considering solutions to help address barriers impairing menstrual health, it is important to note that further research is required to better understand these issues. Research and initiatives should be community-driven and appropriately respect traditional practices to increase the likelihood of communities benefiting maximally. Education has the potential to play an important role in serving to overcome knowledge gaps, however, it must be provided in a culturally sensitive manner [184]. Specific educational barriers that have been identified include the absence of comprehensive, contemporary puberty education, including information regarding the menstrual cycle [185]. Assistance in addressing barriers has been requested by Aboriginal and Torres Strait Islander leaders of health research [186]. When addressing solutions to improve menstrual hygiene management for those of Aboriginal and Torres Strait Islander origin, appropriate consideration and incorporation of cultural and historical factors is important. The establishment of community-controlled, Indigenous-led research and evaluation is critical in maximising sensitivity to community needs and lived experience, especially given this a such a culturally and gender sensitive area, and the history of colonisation and ongoing marginalisation that individuals of Aboriginal and Torres Strait Islander origin have endured [14,184,187]. Given the diversity of Aboriginal and Torres Strait Islander peoples, a one-size-fits-all approach will unlikely be effective. Significant further evidence is required before policies or programs can be effectively informed on how to optimise menstrual hygiene management in those of Aboriginal or Torres Strait Islander origin, otherwise the likelihood of sub-optimal, and even harmful, outcomes will be increased [184,188,189]. It is paramount that policy makers and researchers do not repeat mistakes of the past, and employ solutions that are evidence-based, implemented appropriately and regularly evaluated [190]. Further research on the experience of Aboriginal and Torres Strait Islander peoples who identify as being transgender or intersex is required. Given the complexity of the issue, a multi-pronged approach targeting multiple approaches is required [184].

Family Planning

Despite having a population-level understanding of contraceptive use in Australia, with individuals of reproductive age using primarily OCPs and/or condoms, there is comparatively minimal research examining the contraceptive practices of specific minority groups, such as Aboriginal and Torres Strait Islander peoples [191]. There is evidence of disparities in the contraceptive needs and patterns of Aboriginal and Torres Strait Islander peoples, when compared to non-Aboriginal and Torres Strait Islander peoples; an unsurprising fact, given the post-colonisation enforcement of contraceptive practices on Aboriginal and Torres Strait Islander peoples by non-Indigenous Australians [192]. Practices that were ordained upon Aboriginal and Torres Strait Islander peoples included: (i) ill-consented use of Depo-Provera for short-term infertility; (ii) unexplained sterilisation; (iii) forced removal of children to prevent reproduction; and (iv) legislated criminalisation of intra-community reproduction by Aboriginal and Torres Strait Islander peoples [193]. The

inadequate identification and improvement of these lived experiences has perpetuated these traumas, consequently creating unique and unmet contraceptive issues for Aboriginal and Torres Strait Islander peoples that contribute to contraceptive non-use today. However, it is important to recognise that despite the shared history of forced contraception, each Aboriginal and Torres Strait Islander community is unique, and interventions that are implemented should address this fact [191].

Data from the Aboriginal and Torres Strait Islander Health Survey in 2012-2013 indicates that only 49% of participants used contraceptives, whether it be consistently or on-occasion, comparatively lower than the Australian average of 67% [192]. Additionally, despite there being similar sexual activity rates between young Aboriginal and Torres Strait Islander peoples and young non-Indigenous Australians, teenage pregnancy and birth rates among young Aboriginal and Torres Strait Islander peoples are approximately four times higher, at a rate of 69 per 1,000 individuals, than the rate among non-Indigenous Australians [194]. With approximately 20% of patients at antenatal Aboriginal and Torres Strait Islander health services being adolescents, it indicates additional concerns regarding teenage pregnancies within this demographic, as there is evidence of these pregnancy rates rising [195].

Contraceptive use rates in Aboriginal and Torres Strait Islander peoples are substantially understudied. Given the post-colonisation trauma associated with the forced contraception of Aboriginal and Torres Strait Islander peoples, additional systemic research should be conducted regarding contraceptive use rates and its causal factors in this population [196]. Current evidence suggests that low contraceptive use and high pregnancy rates among Aboriginal and Torres Strait Islander peoples are due to lacklustre availability of pregnancy prevention options, compared to those available to non-Indigenous Australians. Synergistically with this, it was found that Aboriginal and Torres Strait Islander peoples seldom sought assistance with contraceptive management, with consultation rates at several GP clinics averaging 4.48%, lower than 6.15% recorded for non-Aboriginal and Torres Strait Islander patients [197].

The causal factors of contraceptive non-use in Aboriginal and Torres Strait Islander peoples can be analysed through narrative synthesis and categorically tiered, though all factors would be intertwined and interconnected [191]. Firstly, on an intrapersonal level, shame and embarrassment are primary themes identified. Specifically, individuals believe that it is shameful and stigmatising to access contraceptives in both community and clinical settings, with additional elements of fear for lack of confidentiality when discussing contraceptives [198,199,200]. Misconceptions and lack of knowledge regarding general sexual health and modern contraceptives inherently restricted contraceptive use, with the overwhelming and difficult nature of finding accurate information online exacerbating the issue [196,201,202]. Additionally, contraceptive-specific preferences, such as discomfort with condom use and misconceived side effects

of hormonal contraceptives, influenced contraceptive non-use among Aboriginal and Torres Strait Islander individuals [203,204,205].

On an interpersonal level, the first influential relationship was shown to be between Aboriginal and Torres Strait Islander individuals and their partners. Studies found that of all contraceptive methods, external condoms were utilised the most; however, usage rates are still low, in part, due to them being seen as unnecessary in trusting and/or established relationships [206,207]. Additionally, the stigma associated with discussing sexual health among Aboriginal and Torres Strait Islander peoples influenced contraceptive use, as it was observed that condom use and sexual history were not discussed between partners [208].

A common trend observed in heterosexual Aboriginal and Torres Strait Islander relationships is that women felt they were unable to discuss contraceptive use with their partners, or felt pressured to cease all contraceptive use which is a known cause of high pregnancy rates among Aboriginal and Torres Strait Islander women [209,210]. Within these relationships, it was found that desires for offspring were not always mutual; however, contraceptive use would typically reflect the preferences of the male [211].

Furthermore, the stigmatisation of sexual health discussion in Aboriginal and Torres Strait Islander peoples' culture minimised discussions about contraceptives with healthcare providers/educators, as well as family/friends [203,208,211]. When contraceptives were discussed with family or friends, it is common for "misconceptions, misinformation, and negative experiences" regarding contraception to be shared amongst community members, thereby exacerbating contraceptive misuse and non-use [202]. Finally, the context of sexual intercourse heavily influences contraceptive use, particularly in young Aboriginal and Torres Strait Islander peoples. Studies observed that non-consensual sex, which is a pertinent issue in this demographic, along with alcohol and substance use, and general complacency, often described as "getting caught up in the moment", are substantial factors contributing to contraceptive non-use [203,212].

On a community level, three primary trends were observed that influence contraceptive use among Aboriginal and Torres Strait Islander peoples. Firstly, access, or lack thereof, is one major hindrance, as the lack of sexual health and contraceptive counseling services prevented Aboriginal and Torres Strait Islander peoples from seeking advice [213]. And should they find healthcare services, it was found that healthcare services in these communities would lack judgement-free and confidential care. Judgement is believed to stem from healthcare practitioners overestimating their respective community's health literacy level, which highlights the need for the upskilling of Australia's health workforce [202]. In addition, affordability and awareness of where contraceptives can be accessed was another concern raised by Aboriginal and Torres Strait Islander peoples [209].

Stigma was also observed at the community-level where external condom use was not being sanctioned by community Elders; this has significant effects as, due to

cultural principles, the beliefs of community Elders are traditionally revered and followed by Aboriginal and Torres Strait Islander peoples [208]. Finally, the lack of culturally appropriate health services and information was the final community-level cause of contraceptive non-use. Instead of attempting to implement services using the Western medicine paradigm, contraceptive health services need to be tailored to communities through evidence-based collaborations with Aboriginal and Torres Strait Islander individuals and communities that embrace strength-based approaches [205]. For example, a study in North-West South Australia found that the inclusion of an Aboriginal nurse aid at contraceptive consultation sessions facilitated contraceptive use in Aboriginal and Torres Strait Islander peoples [199].

Societal-level causes of contraceptive non-use include economic barriers such as homelessness and impoverishment [198]. Additionally, cultural norms of Aboriginal and Torres Strait Islander peoples are not generally conducive with consistent contraceptive use. For example, in Indigenous culture, the notion of parenthood is viewed as a 'transformative experience', and that nothing, such as contraceptive use, can hinder an individual from experiencing this [212]. Though cultural beliefs may vary between individual communities, these norms remain fundamentally similar [192].

The specific and unmet contraceptive needs of Aboriginal and Torres Strait Islander peoples warrants tailored interventions that are "culturally appropriate, safe, and acceptable for each Aboriginal and Torres Strait Islander community" [191]. The current limitations observed indicate a lack of appropriately trained staff and culturally appropriate contraceptive services, with shortcomings observed in current procedures surrounding tubal ligation, insertion of intrauterine devices, and termination of pregnancies [205]. Aboriginal and Torres Strait Islander peoples need to be afforded equitable access to comprehensive and culturally appropriate sexual and reproductive healthcare that facilitates the reclamation of their reproductive health rights, through strengths-based relationships and life choices education [205]. Interventions need to take a developmental approach that is strengths-based and community focussed, bringing the Aboriginal and Torres Strait Islander health workforce to the forefront in optimising healthcare for the community at the level of policy and clinical practice [214].

However, it is important to acknowledge the difficulties translating local advances in sexual and reproductive healthcare for Aboriginal and Torres Strait Islander peoples into effective national policy reformation and application, with the current trends of short funding and policy cycles. Only when there is the systemic provision of safe and non-judgemental sexual and reproductive care to Aboriginal and Torres Strait Islander peoples will there be tangible reduction in issues regarding their contraceptive use [205].

Individuals Living with Disability

Menstrual Health and Hygiene

There are many potential layers of discrimination that individuals living with disabilities can face in relation to their menstrual cycles, which will likely vary with

different types of abilities. Individuals living with disabilities in LMIC face barriers in accessing appropriate services for menstrual hygiene management, including water, sanitation and hygiene [215,216,217]. In Zambia and Uganda, individuals living with disability have been shown to be viewed as dirty and contagious, resulting in the potential barring from use of public water points or latrines [218]. Access to facilities can be troublesome for certain individuals with disabilities who require aids like handrails, ramps, wider cubicles. Latrines that are inaccessible can result in individuals who cannot see or stand having to sit on dirty latrine seats, or crawl to change their menstrual hygiene materials [38]. Furthermore, individuals with visual impairments may not be able to identify the commencement and completion of menstruation [116]. Individuals living with various disabilities, including those related to communication, hearing or intellect, may have reduced ability to communicate during times of pain, or when they require support [38]. Due to the prevalent misconception that those living with disabilities are asexual, often such people fail to receive education on menstrual hygiene, or sexual and reproductive health [38,219,220]. Individuals who menstruate with intellectual disabilities may require more time when learning the skills involved in menstrual hygiene management [221]. Ensuring education reaches all school types, including special schools, is important in enabling inclusivity and the dissemination of information to all individuals. Maximising accessibility of information through having knowledge materials available in different formats like sign language, Braille, audio, and/or simplified pictures and words can help increase understanding. It is important to have information that is targeted towards individuals of different ages and disabilities [1].

Family Planning

Individuals with disabilities have faced large disparities in access to contraception and family planning services across the world [222,223,224,225]. The barriers faced by this population group vary based on the severity and type of disability (cognitively, physically, visually, hearing and/or speech impairment). Some of the major barriers include poor education, societal stigma, discrimination and lack of disability-related training in healthcare professionals [225,226,227,228].

Poor education and knowledge about contraception options is one of the leading barriers that individuals with disabilities face with regards to contraceptive use [229]. Individuals with disabilities utilise contraception for medical and hygienic reasons, or for better management of their menstrual health; however, in many cases they lack knowledge on why the contraceptive is useful for their needs [229]. This issue is further substantiated in individuals with caretakers, with numerous reports finding that the primary caregivers tend to administer long-term hormonal contraceptives to simplify the regulation of menstruation; while taking an indifferent attitude towards the short and long-term adverse effects that these contraceptives may have on the individual consuming [229,230]. Concerns have also been raised in regards to the administration of contraceptives by third parties such as caretakers, with individuals concerned about being given no say [229]. Surveys have shown that individuals were not informed about the contraceptives in understandable language, and had poor knowledge about the contraceptives [229]. This results in menstruating individuals often consuming hormonal contraceptive

from the onset of menstruation regardless of their current relationship status or potential sexual contact, with their associated side-effects tolerated by the primary care givers in favor of long-term effective protection and menstrual control [229]. Education about hormonal contraceptives is needed, which should be in easy language and include graphic material that individuals are allowed to keep.

There are studies that indicate the forceful sterilisation of individuals living with disability; indicative of how the sexual and reproductive health of individuals living with disability are traditionally ignored, devalued, or socially stigmatised [230,231,232,233]. Because of these misconceptions, individuals living with disability are assumed not to use family planning services, or even seek counselling regarding appropriate contraception options [226,227,234].

This assumption translates to discrimination from healthcare professionals, which is exacerbated by the inadequate health workforce training addressing care of individuals living with disability [235]. When investigating the sexual and reproductive health issues of individuals living with disability, there was greater concern regarding inaccurate contraception information being provided to them, than those living without disability [236]. Studies indicate that information deficiency among individuals living with disability is due to both discriminatory attitudes from healthcare workers and the attitudes of individuals living with disability [228,237,238,239].

Proper training is essential for identifying additional factors that should be considered when treating individuals with disability, such as problematic interactions between disability-related medications [240]. Additionally, the provision of barrier contraceptives may present complications for this demographic due to loss of sensation, limitations in manual dexterity, contractures, and/or spasticity [241]. This emphasises the importance of integrating frameworks for care of individuals with disability into medical curricula [242].

Currently, many studies tend to focus on women with disabilities. A large research gap remains in understanding population-level consequences of the reproductive health care disparities experienced by individuals living with disability, and more research is required to better understand the barriers affecting family planning and contraception access in gender diverse populations and to understand the impact of functional limitations and other disability-related factors on the use of contraceptive methods and access to family planning services.

TGD Individuals

Only 30-40% of transgender individuals receive routine medical care, reporting fear of mistreatment due to their gender identity as the primary reason [243]. There is a lack of formal transgender medicine education at the provider level serving as an additional barrier to high-quality health care for these individuals [244]. TGD individuals face adversities when engaging with medical care due to intrapersonal challenges and discriminatory health care [245]. Provider sensitivity would aid in gender-affirming care to TGD individuals in the clinic setting, such as using

patient's preferred names and pronouns, using gender-neutral terminology, and identifying patients' preferences for their own anatomy [246].

Menstrual Health and Hygiene

Discrimination due to the gender identity of individuals who menstruate can prevent access to necessary materials and facilities, especially toilets [1,247]. When using public toilets, transgender people often face barriers including abuse, harassment and exclusion [247]. TGD people have been portrayed as possible predators in women's restrooms, which has even led to violence [248,249]. Furthermore, individuals who menstruate who choose to use the men's toilets lack access to menstrual hygiene services and infrastructure in those locations. Care should be taken to avoid exposing vulnerabilities or further stigmatising through provision of services by considering that some TGD individuals may have a preference for gender-neutral restrooms; others may prefer gender-segregated facilities given gender-neutral restrooms can expose them to harm [1]. The presence or absence of the menstrual cycle can be a source of anxiety, stress and dysphoria for TGD individuals, although significant research in this area are required to better understand this area [250,251,252]. TGD individuals who menstruate have been shown to avoid discussing menstruation with healthcare professionals given the stigma of their gender identities, potentially leading to reduced timely healthcare [252]. In schools, transgender boys can be unable to access appropriate menstrual health and hygiene information [1]. Adequate training of health professionals and educators should occur to help those who are TGD to access supplies, facilities and knowledge without discrimination or harassment [1]. Increasing discourse on individuals who menstruate who are TGD may make bathrooms safer, and improve healthcare interactions [252].

Family Planning

Additional medical comorbidities, medications, hormonal treatments, and sexual and surgical history must be considered and evaluated for TGD individuals [245]. With an unintended pregnancy rate of 32% among transgender men, there is evidence of unmet contraceptive needs among this population [253]. Studies indicate that rate of contraceptive use ranged between 30%-65% among transgender men, with external condoms being the primary form of contraception used [254]. Once contraindications to certain contraceptives has been ruled out, non-binary individuals assigned female at birth and transgender men should be afforded the same contraceptive options as cisgender women [245].

Currently, there is evidence of failures in contraceptive counselling. Given the potential masculinising effects of testosterone on a developing foetus, 16% of transgender men reported receiving testosterone as contraception despite its contraceptive reliability being poor, with accidental pregnancies being reported by individuals using testosterone as contraception [245,255]. Therefore, providers need to be aware of reliable contraceptives for individuals undergoing gender-affirming hormone therapy. Specifically, the high androgenic activity of progestin contraceptive pills were favoured by transgender men as it made users more prone to hirsutism and male fat distribution. COCPs, though effective, may be less

desirable to this population given the dysphoric effects of oestrogen in counteracting the masculinising effects of gender-affirming hormones [256].

The ability to improve transgender medical care is hindered by limited reproductive health data that examines TGD individuals [257]. Many current contraceptive studies examine primarily transgender men and non-binary individuals with natal female anatomy. Hence, increasing data within TGD populations will allow for more holistic and safe sexual and reproductive healthcare and gender-affirming care for all TGD individuals. Avoiding cisgender and heteronormative assumptions, and remaining sensitive to potential trauma and gender dysphoria associated with physical examinations, will aid in providing reproductive health care that affirms one's gender and addresses the healthcare disparities experienced by TGD individuals [258].

Refugees and Migrants

Menstrual Health and Hygiene

In 2017, more than 26 million individuals who menstruate were displaced as a result of disasters or conflicts [259]. These individuals face additional barriers to achieving optimal menstrual hygiene management. This can include impaired access to menstrual material, products and facilities for the disposal, washing and drying of them [260]. Privacy can be reduced by living in closer proximity to individuals who do not menstruate. Given first response teams and assessment missions are commonly composed of mostly males, individuals who menstruate may have difficulties sharing menstrual cycle concerns and may have to queue for extended time periods for essential provisions which may already be difficult without appropriate menstrual hygiene materials [1]. Additionally, during times of humanitarian crisis, menstruation can further hinder access to educational services, like temporary learning centres, if they lack appropriate hygiene facilities for the safe and dignified management of menstruation [1,260].

Migrant and refugee individuals who menstruate living in Australia have been shown to be at risk of harmful sexual and reproductive health outcomes as a result of low utilisation of health services. This can occur due to inadequate knowledge of menstrual cycles, often associated with cultural and religious taboos [261,262]. Understanding of the sociocultural constraints that contribute to these barriers is important in enabling the provision of culturally sensitive and safe education, products and services [261].

Family Planning

Among the various reproductive health challenges refugees face, unintended pregnancy is a crucial issue [263]. Living in refugee situations exposes individuals to extensive risk factors for unintended pregnancy and reproductive health risks, such as high risk of rape and sexually transmitted infections [264]. Possible causal factors for these increased risks include: early sexual debut; sexual risks such as polyamorism; facing exploitation due to lack of traditional socio-cultural constraints; and having unprotected sexual intercourse [265]. Additionally, evidence indicates that prostitution and transactional sex is prevalent in displacement scenarios by means of survival, as such displacement results in

powerlessness, loss of security, and poverty [266]. Therefore, the context of these sexual encounters would rarely warrant modern contraceptive use, particularly given there were significant gaps in contraceptive knowledge recorded among refugee populations [267]. Furthermore, in heterosexual encounters, irrespective of whether sexual encounters were planned or not, it was found that young refugee women rarely lacked negotiating power for safe sex. This suggests the need for self-efficacy training, in addition to sexual and contraceptive education and counseling, to enable women to negotiate, and practise, safe sex and resist sexual pressures [263].

Among refugee adolescents, there is evidence of age-related disparities in contraceptive use, with contraceptive use being more than three times likely in respondents aged 17-19 compared to those aged 14-16 [268]. While the exact reasoning for this discrepancy is unknown, it could be due to increased likelihood of exposure to contraceptive education in older adolescents. Nonetheless, a common trend among refugees irrespective of age is that displacement trauma has caused complications with decision-making on sexual and reproductive health issues [263].

Globally, there are very few empirical studies that examine the contraceptive use and determinants of individuals in refugee situations [269]. Though information regarding awareness and usage rates of modern contraceptives have been analysed, the underlying determinants remain seldom studied [270]. Without extensive knowledge of the determinants of contraceptive non-use in refugee and displaced populations, delivery of reproductive health services to individuals would be ineffective, doing little to address the health inequities of the broader global refugee crisis [263].

Individuals Experiencing Homelessness

Menstrual Health and Hygiene

People who are homeless face additional challenges when it comes to being able to manage menstrual cycles in a safe and dignified manner. This is contributed to by challenges when accessing clean and safe spaces for the management of menstruation, including for the changing of menstrual products, laundering of clothes and bathing [15]. In high income countries, a pressure to not appear homeless when attempting to access facilities like toilets has been described [15]. When addressing the needs of homeless individuals, menstruation is often overlooked resulting in poor access, and the potential use of unsafe methods while attempting to hide the products of menstruation [271].

Family Planning

Conditions of homelessness lead to reduced control over everyday situations. This means compromising on contraception as well. Homelessness is strongly correlated with financial insecurity, which may hinder the ability to purchase contraceptives, as well as experiences of domestic violence resulting in victims fleeing their homes [272, 273]. Once homeless, there is an increased risk of sexual violence and increased chance of engaging in survival sex [274]. In a cross-sectional study undertaken in Chicago, US, it was found that though 94% of women

experiencing homelessness hoped to avoid pregnancy, most of these women were using the least effective contraceptive methods. The main two barriers were a lack of comprehensive contraceptive counselling and difficulties accessing contraception [275]. Those seeking contraception also face difficulties in accessing sexual and reproductive health services due to discrimination against their homeless state [276].

Importantly, it is difficult to draw generalisable conclusions to shape policy recommendations for this population due to lack of large-cohort, country-wide studies in this area. There is also a dearth of studies on infertility issues in this population. Whether this is due to a lesser need for ART in this population or due to a prejudice against the concerns of this population remains to be understood.

Rural and Remote Populations

Menstrual Health and Hygiene

Individuals who menstruate in rural and remote settings have been shown to often have worse menstrual hygiene management [35]. In LMIC, challenges identified include reduced awareness and knowledge of menstrual health and hygiene, and use of sanitary items [277,278,279,280]. In a study of schoolgirls in Ethiopia, the prevalence of good menstrual hygiene management in rural schoolgirls was 39.9%, compared to 65% for girls in urban settings. Factors contributing to this discrepancy include poorer accessibility to menstrual hygiene materials, and less discussion of sexual and reproductive matters with parents which could result in poorer knowledge. Other contributing factors include reduced exposure to the media than girls in urban settings [281]. A study consisting of a population of schoolgirls from rural Uganda reported that almost two thirds missed school at least once a month as a result of menses [33].

There are many gaps in the literature regarding the relationship between living in rural and remote areas and menstrual health in HIC. In Australia, women who live in rural or remote areas have generally poorer health than women living in metropolitan settings due to environmental and accessibility reasons, as well as differences in risk factors; however, specific differences in menstrual health outcomes could not be found in the literature [282]. In Poland, living in a rural location in early life was found to not be associated with significant differences in menstrual cycle regularity [283].

Family Planning

Data indicates that there are lacklustre family planning services for individuals in rural and remote areas [284]. Studies indicate that fertility rates are higher in rural areas, when compared to rates in urban cities [285,286]. A study by the National Center for Health Statistics (NCHS) of the Centers for Disease Control and Prevention (CDC) indicates that more individuals in rural and remote areas had three or more births (25.7%), compared to gestational individuals living in urban areas (20.19%). Additionally, the average number of births was higher in rural and remote areas than those living in urban areas, with 1.56 and 1.28 births respectively [287].

These higher fertility rates in rural communities, which is attributable to high rates of individuals desiring children, is being unmet by rural family planning services, which are currently insufficient due to factors including inadequate access, suboptimal infrastructure, and maldistribution of healthcare resources [288,289].

Throughout Australia, IVF access differs greatly, with women in regional and remote areas having a 12% lower access to ART [138]. In addition, contraceptive services at rural health centres were not readily available, hence substantially lower contraceptive use rates among rural individuals, when compared to their urban counterparts [290]. Awareness of modern contraceptives are reportedly similar between rural and urban populations, making lack of education an unlikely cause for low contraceptive use, further emphasising the disparity of accessing contraceptive products and services [291].

The rural-urban disparity in contraceptive use is also suggested to be due to demographic differences. Specifically, greater proportions of older gestational individuals were recorded in rural areas, a demographic who may not perceive themselves at-risk of unintended pregnancy, hence the lack of contraceptive use [288]. However, an Australian study found that despite oral contraceptive pills being the most popular contraceptives in urban areas, higher rates of LARCs use were observed in rural and remote communities [284]. The study purports that LARC methods are preferred given the lack of suitable contraceptive services, which raises concerns about addressing complications that may arise with long-term contraceptives. Further research is needed to explain the reasons for the higher rate of LARCs and permanent methods in rural areas [284].

Education

Education is essential for equipping individuals with the knowledge to make informed decisions confidently with all aspects of their sexual and reproductive health. Educational interventions can tackle misconceptions, discriminatory social norms, and cultural taboos that impede upon an individual's menstrual health, contraceptive use, and family planning wishes [1,9,13].

Menstrual health education should detail the menstrual cycle throughout the course of life, highlighting essential differences between normal and abnormal menstruation, while also discussing the effects of contraceptive methods on this process [1,292]. There is evidence of suboptimal contraceptive education, with studies in various LMIC indicating misuse of contraceptives is associated with superficial knowledge of contraceptive options and their mechanisms of action, thereby deleteriously affecting one's menstrual health [158]. By incorporating information on biological functioning into educational interventions, it would enable the identification of menstrual-related symptoms, such as abnormal uterine bleeding and conditions like endometriosis, while providing discussion on symptom types and severities, and their effects on quality of life [293].

Appropriate knowledge should enable individuals who menstruate to seek timely help so menstrual cycle-related discomforts, disorders and sequelae can be

diagnosed and treated for, through means like healthcare services, analgesia and self-care strategies, including behavioural adaptations and coping mechanisms [294].

Education should recognise that both the ability and inability to menstruate can affect the health of individuals [1]. The inability to menstruate can occur in various settings, for example in hypothalamic amenorrhoea, disorders of sexual development and, as mentioned in an earlier section, individuals who are TGD [252,295,296]. This can impair quality of life and can be associated with poorer psychological outcomes, including anxiety and depression [295,296].

Addressing misinformation can arm individuals who menstruate with the knowledge and awareness of support structures that enable them to care for themselves and make informed decisions confidently [294]. Regions, such as Mali and South Africa, where little to no education was provided by parents or health services exacerbated misconceptions of contraceptives and negative social norms, which further contribute to contraceptive misuse and non-use [297]. This is particularly observable in LMIC [297]. The general discrepancy in contraceptive education between LMIC and high-income countries is indicated by the difference in rate of modern contraceptive use between UK and Mali adolescent girls, at 69% and 12%, respectively [298]. Additionally, 54% of adolescent girls in the USA reported using an external condom, relative to 21% in Tanzania [298].

Low contraceptive use can also be attributed to differing social norms, which add complexities in translating individual-level interventions to broader audiences, due to their pertinence at the community and societal levels [299]. Specifically, studies in Mali and South Africa found that any form of menstruation, whether normal or abnormal, was believed to be a method of “clearing the dirt”, and thereby a sign of good health. As such, individuals were not aware of how to identify normal bleeding, and believed that contraceptives, because they prevent menstruation, were bad for one’s health [161]. However, it is important not to dismiss the pertinence of these beliefs in developed countries, but more so at an individual level [297].

Education is important in dismantling stigmas and social norms that are restricting individuals from engaging with all facets of their sexual and reproductive health with safety, dignity, and respect [205]. By understanding their preferences, and being empowered to make such preferences confidently with the appropriate information, individuals would be free to decide if, and how, they want to participate in all life domains as throughout their lives [1,9,13]. Education should adequately prepare individuals who menstruate for menarche; therefore, adequate sexual education and services need to be incorporated to current school curricula. These programs should instil normalcy in seeking help from appropriate health services when abnormal symptoms are identified, with such health services functioning in a system that actively responds to sexual and reproductive health needs [9,13].

The training of these health workers and educators needs to ensure that their services are evidence-based, and that such knowledge is being relayed to patients [1,9,13]. Without adequately-trained health educators, misconceptions continue to perpetuate, creating risks in individuals' sexual and reproductive health [300]. Such misconceptions can also be tackled with effective community-level interventions, which have shown to effectively change sexual and reproductive practices at the individual level. A Zimbabwean study that indicated that the sexual and contraceptive literacy of women in the broader community had a substantial influence on an individual's reproductive behaviour, given that such behaviour was suggestive above their own personal understanding of contraception [301]. Interestingly, this suggests that the educational effects on contraceptive use would be underestimated if considering only individual-level interventions [300].

It is important to recognise the multifaceted causal channel in the relationship between education and sexual and reproductive health practices. Education provided to individuals should be evidence-based, culturally-sensitive, and age-appropriate, with information being accessible and applicable to their sexual and reproductive needs [1,9,13]. In addition to considering the intrapersonal, community and societal effects on an individual's sexual and reproductive practices, interpersonal effects also need to be considered in the design of interventions [300]. For example, information regarding menstrual health and hygiene should be accessible to those who experience menstrual cycles and menstruation; however, engaging non-menstruating adolescents, youths and adults should not be neglected [9,13].

Specifically looking at contraceptive use and family planning beliefs, it was found that an individual's partner, and their beliefs and understandings, had an influence on the contraception use, particularly if sexual intercourse occurred frequently [302]. Modelling the contraceptive education rates of both the gestational individual and their partner indicated that both had an effect on contraceptive use; however, the former's contraceptive education level ultimately had greater influence on contraceptive use, and the type of contraception used [300]. Nonetheless, this emphasises the importance of approaching sexual and reproductive education holistically, irrespective of which principles directly apply to an individual [302].

This need for systemic education is evidenced by studies indicating that ART is more likely to be used by older, more educated Caucasian couples - after adjusting for financial factors [303]. Fertility awareness must be widely incorporated into sexuality education programmes for individuals of all levels of privilege. This education should highlight modifiable risk factors for fertility, such as prevention, early diagnosis and treatment of STIs; as well as prevention of complications from unsafe abortion, postpartum sepsis and abdominal/pelvic surgery and environmental toxin exposure [304].

It is also important to consider the role of non-gestational individuals in ART and IVF education, and treatment in all family structures. In low-resource settings, it is

known that men undergoing IVF with their partners face stigma, feelings of loss of 'masculinity', financial burden, insufficient knowledge about the IVF process, and unmet expectations of care [305]. Early education and counselling can also prevent infertility in non-gestational individuals, increase uptake of IVF by couples, and increase treatment participation rates. This also normalises infertility problems as medical conditions which can be overcome [138].

In order to implement efficacious educational interventions, it is essential to recognise the intrapersonal, interpersonal, and societal effects on one's sexual and reproductive health beliefs [300]. Healthcare providers have a duty to balance societal norms with good clinical practice to ensure evidence-based sexual and reproductive counselling is provided to all individuals [306]. Failure to adequately address miseducation, stigma, and discriminatory societal norms can lead to dire consequences concerning gestational health, child mortality, and poverty [297,307].



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