

## Dual use of condoms and contraceptives in the USA

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**Abstract.** *Background:* Use of condoms in conjunction with other contraceptive methods has multiple benefits: prevention of unintended pregnancy, protection against sexually transmissible infections (STI), and sequentially, defence against the threat of infertility. However, few reviews compare dual method use prevalence or trends or systematically review the facilitators and barriers of dual method use across multiple studies. *Methods:* The authors review the literature on trends and covariates of dual method use in the USA among both nationally representative and smaller samples. *Results:* Although dual method use prevalence estimates vary widely across study populations, nationally representative estimates are consistently lower than Western European countries, who in turn report lower rates of unintended pregnancies and STI. The majority of published work on dual method use focuses on adolescents. Prior studies have associated dual method use with a range of individual-level factors: socio-demographic variables, such as younger age; STI risk behaviours and risk perception; relationship variables, such as number of partners, relationship length, and partner support of condoms; and educational factors, such as prior exposure to HIV prevention messages. *Conclusions:* Although dual method use appears to be on the rise, especially among adolescents and young adults, US rates are comparatively low and leave much room for improvement. This review identifies several populations most in need of intervention. However, we encourage public health practitioners to evolve beyond individual-level studies and interventions to focus on the relational, socio-cultural, and structural influences on dual method use. Dual use promotion programs and policies should also equally target men *and* women, adolescents *and* adults.

**Additional keywords:** contraception, dual method use, dual prevention, pregnancy prevention, STI prevention.

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### Introduction: dual method use and why it matters

One cannot get far in the sexual health field these days without running into the concept of *dual method use*, which we refer to here as use of a condom in conjunction with another contraceptive method (primarily a hormonal method, such as the oral contraceptive pill).<sup>\*</sup> And for good reason: the sexual health benefits of dual method use are substantial. Perhaps the most widely cited benefit of dual use is its *dual protection* feature – that is, protection against both sexually transmissible infections (STI) and unintended pregnancy. In the USA, while pregnancy rates have showed sustained decline among women under 30 years of age in recent decades,<sup>3</sup> current rates of both unintended pregnancy<sup>4</sup> and STI<sup>5</sup> remain the highest in the industrialised world. To be sure, when used by themselves, condoms do protect against both pregnancy and

disease (and indeed, are the only single method to do so). Yet condoms are generally less effective at pregnancy prevention than many other contraceptive methods. Alternatively, most contraceptive methods offer no protection against STI, including HIV, and some may even increase women's STI susceptibility through mechanisms such as cervical ectopy.<sup>6,7</sup> Thus, consistent use of both condoms and another contraceptive method can sizably reduce a couple's susceptibility to unwanted pregnancy and disease. Moreover, protection against STI can also help prevent infertility. At least one author has alluded to the 'triple protection needs of young women' to describe the prevention of unintended pregnancy, STI, *and* infertility.<sup>8</sup>

A less-cited, but perhaps equally important, benefit of dual method use is *improved pregnancy prevention*, regardless of a couple's exposure to STI.<sup>9–11</sup> In a recent analysis of the

<sup>\*</sup>Dual method use is in some ways synonymous with the concept of *dual protection*, but this latter concept also refers to the sole use of a condom to prevent both pregnancy and sexually transmissible infections.<sup>1</sup> Cates and Steiner have written about the 'dilemma' facing those who wish to promote dual protection: whether to advocate for two methods (one primarily to prevent pregnancy and the other primarily to prevent infections), or emphasise condoms for both purposes.<sup>2</sup> The authors suggest that the answer depends on two primary factors: the risk of infection, and the relative consequences of an unintended pregnancy. They also argue that promoting condoms for prevention of pregnancy *will* result in greater condom use and, as a result, lower infection rates at the population level. That said, in the remainder of this review, we will focus on the use of condoms *with other contraceptives*.

National Survey of Family Growth (NSFG; Cycle 6, or years 2002–03), a nationally representative survey of 15–44-year-old women and men in the USA, Pazol *et al.* estimated the following: if half of all women using highly effective contraceptive methods alone also used condoms consistently, ~40% of unplanned pregnancies and abortions among these women could be prevented, for an annual national reduction of 393 000 unplanned pregnancies and nearly 76 000 abortions.<sup>9</sup> The authors pointed to the distressing typical-use failure rates of user-dependent methods such as the pill as another sound justification for concomitant condom use. While few women taking the pill correctly and consistently can expect to become pregnant during a 12-month period (0.3%), typical use rates (due to missed pills, for example) suggest that closer to 9 in 100 women (8.7%) will become unintentionally pregnant over the course of a year.<sup>12</sup> Such typical use failure rates contribute to the alarmingly high unintended pregnancy rate in the USA.<sup>13</sup> Thus, dual method use holds great promise as an unintended pregnancy risk reducer, both at the individual and population level.<sup>9–11</sup>

Despite the multiple benefits of dual method use, few reviews of the literature on dual methods exist.<sup>14</sup> The remainder of this paper reviews the current literature to describe trends and prevalence of dual method use, the barriers and facilitators of dual use, and an agenda for future work in this area. To locate the literature reviewed in this manuscript, authors searched PubMed and Web of Science databases using the following keywords: *dual method use, dual prevention, condoms, contraception, pregnancy prevention, and STI prevention*. Articles identified as especially pertinent to the topic then became the focus of ‘cited reference searches’ in the Web of Science database, which located the references that had cited these key papers. We included both quantitative and qualitative analyses, but search criteria located surprisingly few qualitative studies. Finally, with the exception of studies comparing prevalence rates across countries, we limited the review to research located in the USA.<sup>†</sup>

In the remainder of this paper, we first present trends and prevalence estimates of dual use, drawing primarily on nationally representative studies. Then, using both nationally representative and smaller studies, we review the factors associated with dual use in prior research. These factors (socio-demographic, reproductive-health-related, sexual, partner/relationship, and educational and parental factors) are clustered by the themes that emerged during the review and analysis of the literature. Finally, we outline an agenda for future research on dual method use.

### Prevalence estimates and trends of dual method use

Despite significant room for improvement, several analyses suggest that dual method use has been slowly but gradually increasing in the USA, especially among adolescents and young adults.<sup>15–18</sup> Prevalence estimates do vary widely according to study population, year, and definition of dual method use; we encountered a range dual method use among adult women of 1–3%<sup>15</sup> to 25–29% dual method use among youth.<sup>19,20</sup>

### Nationally representative prevalence and trends among youth

Anderson *et al.*<sup>21</sup> analysed condom use with a hormonal contraceptive method at last intercourse across six rounds of the nationally representative Youth Risk Behaviour Survey (YRBS), which tracks health risk behaviour among 9th to 12th grade high school students for the nation and many states and cities.<sup>22</sup> The authors found that dual method use had increased steadily and significantly over the 1990s, from 3.2% in 1991 to 7.2% in 2001.<sup>21</sup> Other studies demonstrate similar trends, albeit with larger prevalence estimates. In their analysis of data from the NSFG, Abma *et al.* found that, in 2002, 19.5% of sexually active 15–19-year-old girls and 23.9% of boys reported use of condom and a hormonal method at last intercourse, compared with only 8.4% and 16.5%, respectively, in 1995.<sup>17</sup> Higher estimates from the latter study may reflect several factors, including the survey’s wider range of adolescent participants (not just those in school) and a slightly older age range. A recent study did indicate, however, that dual method use may be growing even among younger school-based populations. In their recent analysis of the National Longitudinal Study of Adolescent Health (also known as Add Health), which monitors 7th to 11th graders, Sieving *et al.* found a range of dual method use estimates from 14.3% (among 7–9th grade boys at Wave 1) to 25.0% (among 7–9th grade girls at Wave 2).<sup>19</sup> Their greater prevalence estimates may reflect their definition of dual method use, which the authors classified as use of a condom with *any other contraceptive method* at last intercourse, compared with condom use and a hormonal method only, as in the former studies.

### Nationally representative prevalence and trends among adults

Far fewer studies have examined prevalence and trends of dual method use among adults, particularly at the national level. Moreover, dual method use estimates among adults are difficult to obtain from the NSFG, usually our best source of information about contraceptive practices. In the last three rounds of the NSFG, although women could report use of up to four methods of contraception in the last month, survey reports generally count only the most effective method, which can lead to underestimates of dual use.<sup>3,23</sup> More recent NSFG surveys have included questions that make it more possible to measure dual or multiple use, but researchers still have no way of knowing if women have used more than one method consistently or intermittently across sexual encounters. According to the NSFG parent report from the Centers for Disease Control, in 2006–08, only 8.4% of all 15–44-year-old women reported using more than one method in the last month (these women constituted 13.5% of all contraceptive users) – but dual users were not further disaggregated by method type. In terms of condom use specifically, 10.0% of women reported that the male condom was their most effective method of contraception, but 13.9% of women and their male partners reported any use of condoms in

<sup>†</sup>Some papers included in this review did not emerge using the above search criteria but were known previously to the authors and cited as appropriate, especially in the concluding section.

the last month, suggesting a dual method use rate of 3.9%.<sup>3</sup> This figure represents scanty improvement from an analysis of condom use in earlier rounds of the NSFG.<sup>15</sup> Bankole and colleagues found that, according to 1995 NSFG data, 3% of 15–44-year-old women reported the use of a condom and another contraceptive method in the last month, although this figure did represent an increase from only 1% in 1988.<sup>15</sup>

### International comparisons

We could find no cross-national studies comparing dual use rates among adults.<sup>‡</sup> However, several studies compare dual use rates among adolescents, all of which paint a dismal picture for the USA. Godeau and colleagues<sup>25</sup> recently compared cross-sectional data on contraceptive use, including dual method use, among 15–24 year olds in 24 countries from the Global North – primarily Eastern and Western Europe. The USA was excluded, but the comparative USA rate for current dual method use is 7.2% – a figure from the 2001 YRBS<sup>21</sup> (YRBS constitutes the best comparison group since the survey from Godeau *et al.* took place in schools). Across the 24 countries or regions surveyed by Godeau *et al.*, 15.7% of participants reported using both contraceptive pills and condoms at last sexual intercourse. This rate, more than double the USA rate of 7.2%, nonetheless hides significant variation across countries. In two countries (the Netherlands and Belgium), more than 30% of participants reported dual method use; in Canada, more than one in four sexually active 15–24 year olds (28.8%) reported current dual method use. In a Guttmacher Institute study of reproductive health behaviours in developed countries, Darroch *et al.* found that, compared with Canada, France, UK, and Sweden, the USA had the lowest rates of dual method use; the USA also had the highest rates of teenage pregnancy.<sup>26,27</sup> Finally, a comparative study of the USA, France, Germany, and the Netherlands also found the lowest rates of dual prevention in the USA.<sup>28</sup>

Sexual health advocates have advanced numerous theories to explain lower rates of dual method use and higher rates of adolescent pregnancy and STI in the USA than in other industrialised countries. Many of those countries with the highest rates of dual method use have much greater cultural acceptance of sexuality, especially among young people.<sup>28–30</sup> Santelli and colleagues have posited that such differences may be explained by ‘structural factors, such as norms about contraceptive use, the presence and context of sexuality education, existence of adolescent health services, and national policies that affect accessibility of contraception’.<sup>31</sup> These authors also noted that contraceptive use among young teenagers is particularly high (and pregnancy low) in countries like the Netherlands that condone teenage contraceptive use and ensure adolescent access to contraception and sex education. The USA has a great deal to learn from those countries – not just about individual level predictors of contraceptive use, but also about cultural, structural, and health infrastructure level factors.

## Factors associated with dual method use

Regardless of the comparatively low rates of dual use in the USA, several factors increase an individual’s likelihood of using both condoms and another contraceptive method.

### Socio-demographic characteristics

#### Age

Researchers consistently find an inverse association between age and likelihood of dual method use.<sup>9,15,32–35</sup> For example, in a longitudinal study of 1073 new users of either the contraceptive implant or injectables, 15–19 year olds were significantly more likely than adult women to use condoms in conjunction with their new hormonal methods, even when factors such as number of partners and perceived HIV risk were controlled for.<sup>34</sup> Recent data from the NSFG indicates that, in 2002–03, women who were 25 or older had lower odds than 20–24 year olds of using condoms with the pill or patch.<sup>9</sup> More prevalent dual method use among young people may logically reflect their greater susceptibility to both unintended pregnancies and STI. Rates of both unintended pregnancies and STI tend to be highest among adolescents and young adults, and nearly half of new HIV infections worldwide befall 15–24 year olds.<sup>36</sup> Moreover, a larger proportion of unintended pregnancies in the USA occur among 18–24 year olds than any other age group, and 54% of *all* unintended pregnancies occur among women younger than age 25.<sup>13</sup>

#### Education

Surprisingly few studies of dual prevention account for education level, perhaps due to the adolescent focus of many studies in which participants have not yet completed their schooling. However, level of education is known to significantly influence other contraceptive practices, including method choice,<sup>3</sup> and is thus likely to influence dual method use as well. In their analysis of recent data from the NSFG, Pazol *et al.* found that, compared with women who had less than a high school education, women with greater than a high school education had lower odds of using dual methods.<sup>9</sup> However, Cushman *et al.* found no statistically significant effect of education on dual method use.<sup>34</sup>

#### Race and/or ethnicity

Dual method use may also vary by race and/or ethnicity, but not all studies show consistent patterns. When racial and/or ethnic differences do emerge, African Americans usually demonstrate the highest rates of dual prevention. A study of women undergoing tubal sterilisation found that, compared with white and Hispanic women, black women were most likely to report planned condom use after the procedure.<sup>35</sup> A nationally representative analysis of 14–22 year olds found that blacks were significantly more likely than whites or Hispanics to have used a condom and the pill at last sexual intercourse.<sup>33</sup> Black

<sup>‡</sup>That said, at least one study offered nationally representative dual method use rates among 18–44-year-old women in Australia.<sup>24</sup> The authors found that 15.4% of respondents reported using two or more methods as their current method of contraception, primarily condoms and the pill. According to data from the National Survey of Family Growth, the comparative rate among 18–44 year olds in the USA is only 3.9%.<sup>3</sup>

women were almost twice as likely as white or Hispanic women to continue using condoms after initiating hormonal implants or injectables.<sup>34</sup> In contrast, in a recent analysis of a nationally representative sample of 14–17 year olds, Anderson *et al.* revealed that white high school students were significantly more likely than black students, Hispanics, or other racial and/or ethnic groups to have used condoms and another method at last sex.<sup>21</sup> A nationally representative study of 15–44 year olds found that Hispanics had significantly greater odds of using condoms and another method in the last month compared with non-Hispanic blacks or whites.<sup>9</sup> Finally, some studies show more similarities than differences across racial and/or ethnic groups. In an analysis of the Add Health data,<sup>20</sup> dual method use ranged from 19% of sexual relationships for Latino men to about one-quarter of relationships for black men, white men, and Latino women, 26% of relationships for black women and 29% of sexual relationships for white women. In sum, race/ethnicity may have some effect on propensity for dual method use, although this relationship may change depending on the age group or subpopulation.

### *Contraceptive and pregnancy factors*

#### *Contraceptive method type*

Several investigations indicate that women on user-dependent methods such as the pill or patch are more likely to also be using condoms than women on user-independent methods such as injectables, implants, or intrauterine contraception.<sup>9,37–40</sup> Such findings may reflect greater propensity for user error with user-dependent methods;<sup>41</sup> women may be more likely to ‘double up’ on pregnancy protection if they have missed pills or applied a new patch several days late. Although some of the former analyses excluded sterilised participants, sterilised women in several studies were less likely than pill users to also be using condoms, even when presenting similar sexual risk profiles.<sup>42,43</sup> That said, other studies show no difference in condom use across contraceptive methods.<sup>44–46</sup>

#### *Condom confidence and prior use*

Prior use of and trust in condoms, in terms of both pregnancy and STI prevention, have also been associated with dual method use. Riehm *et al.* reported that positive attitudes towards safer sex, ever having refused sex without a condom, and believing that condom use reduces HIV risk all helped predict dual method use.<sup>47</sup> Cushman *et al.* found that prior condom use was associated with current condom use among women who had recently begun using a hormonal method.<sup>34</sup> Harvey *et al.* demonstrated that women confident about using condoms without feeling embarrassed or worried about breaking the sexual mood were more likely to have used condoms and another method of contraception in the last the 3 months.<sup>32</sup>

#### *Motivation to avoid pregnancy*

Among 522 sexually active young women attending adolescent medicine clinics, Crosby *et al.* found that a strong desire to avoid pregnancy was the most influential correlate of consistent dual method use.<sup>48</sup> Although to our knowledge no other dual method use studies measured pregnancy motivations,

prior research on the connection between pregnancy intentions and contraceptive practices indicates a likely relationship between strength of motivation to avoid pregnancy and likelihood of dual method use.

### *Sexual behaviour profiles and perception of STI risk*

#### *STI concern*

Like pregnancy intention and concern, STI concern has been associated with dual method use.<sup>34</sup> In their analysis of the 1995 National Survey of Adolescent Males, Lindberg *et al.* found that young men who worried about AIDS and STI (as well as those who discussed contraception, STI, or condom use with partners) were more likely to report dual method use at last sex.<sup>49</sup> In another study, those adult women highly motivated to avoid HIV and STI were more likely to use dual methods or only condoms in the last three months compared with women using only one (non-condom) method.<sup>32</sup>

#### *Number of partners*

Women at potentially greater STI risk because of multiple partners have been more likely to report dual method use across multiple investigations.<sup>9,15,32,34,35</sup> For example, in one longitudinal study of over 1000 new users of either contraceptive implants or injectables, women who had more than one sexual partner over the study period were 5.4 times as likely to use condoms consistently at follow up.<sup>34</sup>

#### *Perception of STI risk*

Women with a greater sense of STI susceptibility in their own relationships report more consistent use of a condom and another method.<sup>34,42</sup> Indeed, dual users may be at greatest risk of contracting STI in the first place.<sup>32</sup> That said, not all studies demonstrate a connection between risk behaviours, risk perception, and dual method use.<sup>47</sup> For example, Santelli *et al.* found that personal and partner behavioural risk factors for HIV and STI did not predict dual method use among socially disadvantaged women in Baltimore.<sup>40</sup>

#### *Partner and relationship factors*

Despite the fact that the use of condoms during sexual intercourse requires an interaction with another person, most examinations of dual method use have focussed on women only. Far fewer studies have collected data from men, and even fewer have examined the influence of relationship characteristics and dynamics on a couple’s likelihood of using dual methods.<sup>47</sup> Those few studies that did explore partner and relationship factors highlighted the importance of such factors in facilitating dual method use.

#### *Relationship length and characteristics*

Multiple sources suggest that as the length of relationships increase, long-term methods such as oral contraceptives are substituted for condoms.<sup>50–52</sup> Researchers posit that heterosexual women perceive long-term partners in more stable relationships as less risky and partners of short duration or partners in less-stable relationships as more risky;<sup>32,52</sup> and that condoms can also stymie intimacy and connection as intimacy grows between members of a couple.<sup>2,16,36,53</sup> Accordingly, dual

method users often report significantly shorter relationship duration than single method users.<sup>15,32,34,35</sup> Dual method users are often less likely than others to be married<sup>9,15,35,44,47</sup> or living with their partner, and more likely to have been with a partner for a shorter duration.<sup>34,35</sup> Poppen and Reisen found that dual users of pills and condoms were in newer relationships, were less committed to their current relationships, and perceived their partners as more likely to have HIV or other STI compared with women using condoms only, the pill only, or no method.<sup>52</sup> The authors rejected the notion of a personality profile of a 'dual user,' and suggested instead that women are most likely to use dual methods when their relationship situations warrant it.<sup>52,§</sup>

#### *Partner dynamics*

Other research suggests that, rather than a woman making independent contraceptive decisions based on her relationship situation and individual-level characteristics, partner preferences and dynamics work synergistically to shape dual method use. In their qualitative study of women's and men's perspectives of the dual method, Woodsong and Koo found high level of agreement between men and women on the barriers and facilitators of combined use of condoms and another contraceptive method.<sup>53</sup> Respondents of both genders not only indicated a desire to use condoms consistently, but also described how using condoms can undermine the establishment of trust in relationships. In their 2006 Couples Survey, Grady *et al.*<sup>54</sup> used computer-assisted self interviewing to collect data from 413 married couples, 261 cohabitating couples, and 335 dating, non-cohabitating individual participants ( $n=2018$  individuals) in four American cities. Investigators found that type of method used at last sex was significantly related to the *couple's* method preferences. Women's pill ratings more strongly influenced dual method use than men's pill ratings, and men's condom ratings more strongly influenced dual method use than women's condom ratings. However, the importance of woman's condom ratings increased, and the influence of her partner's ratings declined, as her relative income rose.

#### *Partner support of condom and contraception use*

Like Grady *et al.*, Weisman *et al.* found that consistency of condom use among adolescent pill users was greater when the partner was supportive of condom use.<sup>55</sup> Sangi-Haghpeykar *et al.* also found that a partner's positive opinion about condoms was one of the strongest correlates of consistent use of condoms by both sterilised women<sup>42</sup> and low-income, hormonal-method users.<sup>44</sup> In an analysis of the 1995 National Survey of Adolescent Males, young men who believed that men were at least somewhat responsible for contraception were more likely to report dual method use; so were young men who reported talking with their partner about contraception and condoms.<sup>49</sup> Taken cumulatively, the above results strongly support the argument that men's method preference and contraceptive attitudes can greatly facilitate dual method use.

#### *Educational and parental communication factors*

We encountered few empirical studies associating prior sex education with likelihood of dual method use, although comprehensive sex education is likely to increase the odds of dual use (along similar lines, few analyses have empirically linked dual method use to health insurance or access to affordable reproductive health services, even though health-level factors undoubtedly play a part in dual use prevalence). That said, several studies do demonstrate that sexual health education, whether in school-based or clinical settings, can increase dual method use. Santelli *et al.* discovered that instruction about HIV in a school-type setting encouraged dual method use among adolescents.<sup>33</sup> Cushman *et al.* found that new hormonal method users who received AIDS-specific counselling were 1.6 times as likely to be using condoms in conjunction with their hormonal method at follow up than women who did not receive such counselling.<sup>34</sup> Finally, parental communication, instruction, and expectations around contraception and sex may also facilitate dual method use. A recent study showed that sexually active adolescents' perceptions of parent expectations about sex and contraception were associated with dual method use.<sup>19</sup> Research has also linked parental communication about sexual risk with adolescent girls' propensity for dual method use.<sup>33,48</sup>

#### **Conclusions, implications, and future directions**

This review has provided an overview of the benefits of dual method use, the comparatively low – but gradually rising – rates of dual method use in the USA, and the factors most strongly associated with dual use in previous studies. We identified several consistent trends and findings across studies, including the lower prevalence of dual method use in the USA compared with other Western countries. Factors consistently correlated with dual method use include younger age, newer relationship status, multiple partnerships, greater perception of STI risk, and more positive associations with condoms and safer sex among both women and their partners. Other factors, such as race and/or ethnicity and education, were inconsistently correlated with dual use across studies, which may reflect differences in study populations or measurement. In the remaining paragraphs, we overview some of the other areas of focus in the literature and outline an agenda for future research on dual method use.

Prior studies exhibit three clear foci of emphasis: adolescents versus adults; women versus men or couples; and individual-level factors versus studies of socio-cultural or structural factors. Taken independently, each focus has clear justification. For example, adolescents may be especially good candidates for dual method use given their relatively rapid relationship turnover, normalisation to condoms, and high rates of both unintended pregnancies and STI. Nonetheless, future research on dual prevention should emphasise several areas that remain largely unaddressed.

<sup>§</sup>That said, few studies have examined personality traits in relation to dual use, which may be an area for future study.

First, if we are to overcome some of the socio-cultural and structural barriers to dual method use that may contribute to the USA's relatively low dual method use rates (and high unintended pregnancy and STI rates), future studies of dual prevention must evolve beyond individual-level factors alone. We encourage researchers and policy makers alike to explore how low-cost reproductive health services, comprehensive sexuality education, social and parental endorsement of contraception, and larger cultural acceptance of sexuality all may contribute to dual use, both in the USA and in other industrialised countries. Cultural-level resistance to condoms as a barrier to intimacy and trust<sup>2,16,36,53</sup> may also be an important focus for future research, development of interventions, and social messaging. Such cultural associations also suggest the great potential utility of promoting dual method use not necessarily for combined STI and pregnancy protection, but as extra-effective pregnancy prevention. Qualitative research methods could be especially helpful in identifying and addressing cultural and structural constraints. For example, one of the only qualitative studies located by this review used in-depth interviews to describe multiple levels of influence on dual method use: structural and environmental (e.g. logistical and economic difficulty obtaining contraceptives), social and interpersonal influences (e.g. family values of sexuality, partner support), and psychosocial influences (e.g. self esteem).<sup>56</sup>

Second, burgeoning literature suggests the importance of collecting data from men and couples versus women alone. In other words, men's – and couples' – preferences and characteristics may greatly facilitate dual method use. In moving forward, researchers and practitioners must remember that men play a key role in couple-based communication and contraceptive practices.<sup>57</sup> Public health interventions intended to increase condom use have historically been directed at women, but the results reviewed above indicate that inclusion of men in such interventions may be essential for increasing condom use and dual method use.<sup>42</sup>

Third, while a focus on adolescents in prior literature is in many ways justified, researchers must not forget about the importance of dual method use for adults. After all, a much greater proportion of women in their 20s experience unintended pregnancies compared with adolescents,<sup>13</sup> and STI rates are twice as common among 20–24 year olds as among 15–19 year olds.<sup>58</sup> Moreover, a recent nationally representative study of condom use in the USA found that adults use condoms much less frequently than adolescents.<sup>59</sup> Adolescent boys (14–17 year olds) reported, on average, that 84% of the past 10 vaginal intercourse events with a casual partner were condom-protected; comparatively, only 47% of 18–24 year olds', 26% of 40–49 year olds', and 28% of 50–59 year olds' last 10 vaginal intercourse events with a casual partner were condom-protected.

Condom use, either solely or in conjunction with another contraceptive method, is less normative among older adults than among youth. Innovative studies and programs must be undertaken to address the dual prevention needs of adults.

Fourth, we suggest that provider- and service-level barriers must be a focus of future work on dual method use. Certainly, the mutual goal of preventing both STI and pregnancy is best achieved in the context of a single setting and during the same encounter versus separate site-visits or patient–provider encounters.<sup>14</sup> However, Cates and Stone argued that formidable service-level challenges prevent such streamlined dual prevention service delivery.<sup>60</sup> Research, too, tends to proceed on two different tracks, despite the fact that the same, or similar, behaviours are responsible for both pregnancy and STI.<sup>61</sup> Bearinger and Resnick suggest that this categorical approach to pregnancy versus STI explains the relative infancy of dual method research relative to most other factors of health research.<sup>14</sup> Furthermore, clinicians themselves may not know whether to advocate for the consistent and correct use of condoms as the primary method to prevent both pregnancy and STI or to encourage use of two different contraceptive methods to assure more comprehensive protection against these outcomes<sup>62</sup> – despite providers' perception that STI prevention *is* an integral part of family planning (or vice versa).<sup>63</sup>

Fifth and finally, we suggest that the field needs more consistent measurement(s) of dual method use. The literature documents two primary definitions of dual method use: use of a condom and another contraceptive method versus use of one method (condoms) to protect against both pregnancy and disease.<sup>††</sup> In this review, we operationalised dual method use as use of a condom and another method. However, even our relatively narrow definition could allude to many sexual scenarios: use of a condom and a 'highly effective' contraceptive method<sup>32</sup> (e.g. hormonal methods or intrauterine contraception); use of a condom with *any* other method, including withdrawal, rhythm, breastfeeding, or emergency contraception; use of a condom and another contraceptive method during *every single act* of vaginal intercourse; or finally, use of a condom *intermittently* with other methods, depending on the couple's preference in the moment, the availability of condoms, or the woman's phase of her menstrual cycle. Research on withdrawal use shows that a large proportion of condom users have also used withdrawal in the last month, and vice versa.<sup>23</sup> Coitus-dependent methods may be especially likely to be used in conjunction with one another and/or intermittently. Moreover, studies of contraceptive use rarely assess *correct* use of a method, even though condom research indicates that a significant proportion of people who report consistent condom use may be using the method incorrectly (e.g. late application, early removal, not leaving space at the tip).<sup>65–67</sup>

\*\*Berer<sup>1</sup> argues that dual protection has received far more attention from family planning practitioners than HIV/STI professionals.

††Berer<sup>1,64</sup> has suggested that the most widespread definition of dual protection – use of a condom in conjunction with the pill – is inappropriately narrow. First, she argues that safer sex is broader than protected vaginal–penile intercourse. Second, many people are ignored by this definition, including people who use condoms and emergency contraception, condoms and withdrawal, or condoms and breastfeeding.<sup>23</sup> Sterilisation is one of the most common methods of contraception in the USA and many other countries, but with few exceptions,<sup>35</sup> researchers or practitioners rarely consider the importance of using condoms in conjunction with tubal ligation or vasectomy.

Other contraceptive methods may be similarly misused (e.g. missed pills, delayed shots, ring insertion, or patch application), thus compromising effectiveness. If we are to truly document, understand, and improve dual use, we need to measure it in ways sophisticated enough to assess such varied combinations and use patterns.

### Conflicts of interest

None declared.

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