

Corrigendum

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The publisher wishes to advise that the correct author's name is Dorothy A. Machalek

Reducing the burden of sexually transmissible infections in Papua New Guinea requires strengthening of clinical services and engaging men

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In this edition of *Sexual Health*, Valley *et al.* report the results of a cross-sectional prevalence survey of sexually transmissible infections (STIs) among women attending their first antenatal visit in three provinces of Papua New Guinea (PNG). Over 80% of women attending six antenatal clinics were enrolled and among 765 women consecutively recruited, STI prevalence was extremely high, with 43% being diagnosed with chlamydia, gonorrhoea and/or trichomonas infection. Chlamydia was the most prevalent at 22.9%, followed by trichomonas (22.4%) and gonorrhoea (14.2%). They also found a prevalence of 3.0% for active syphilis, 28.0% for herpes simplex virus type 2 and 0.8% for HIV.¹ There was considerable variation in STI prevalence by province. This Editorial examines potential reasons for these high prevalence estimates and discusses strategies for addressing high STI rates in PNG.

While these prevalence estimates are alarmingly high, they are consistent with those previously reported in PNG.^{2,3} High STI prevalence estimates have also been reported among pregnant women in other Pacific Island nations (including Fiji, Kiribati, Samoa, Solomon Islands, Tonga and Vanuatu).⁴ The recent World Health Organization global STI estimates confirms that PNG has among the highest STI prevalence estimates observed worldwide.⁵ The reasons for the higher prevalence estimates observed in PNG are unclear, but they are likely to be multifactorial. Higher STI rates are associated with poverty and income inequality.⁶ Even in countries such as the United States, where there is high per capita gross domestic product but considerable income inequality and restricted access to affordable health care, higher STI rates are observed.⁶ Access to affordable, culturally appropriate health care and health promotion is critical for controlling STIs. Locally, specific gender power disparities, gender roles, sexual violence, low levels of condom use and low rates of

male circumcision observed in PNG are also likely to be important factors contributing to higher STI rates in PNG.²

Sexually transmissible infections during pregnancy can have considerable morbidity and mortality. They increase the risk of still birth, preterm delivery and low birthweight.^{7–10} Syphilis can cause congenital syphilis in the infant, a severe, disabling and often life-threatening infection.¹⁰ Chlamydia or gonorrhoea transmitted to the baby during vaginal birth can cause conjunctivitis and pneumonitis in the infant.¹¹ Furthermore, the presence of STIs, particularly ulcerative STIs such as syphilis and herpes, increases the risk of HIV acquisition in the mother.¹² If the pregnant woman is HIV positive and cannot access appropriate medication, there is an increased risk of HIV vertical transmission. Given PNG has endemic malaria, which also has considerable morbidity and mortality in pregnancy, it is vital that any additional health risk from STIs is reduced.¹³

The study found that STI prevalence was highest among young women under 20 years of age, among women reporting their first pregnancy and among those who reported two or more partners. It may be possible to use these findings to target screening, if resources are limited, to higher-risk adolescent girls and those women for whom it is their first pregnancy.

Antenatal care provides the opportunity to screen and treat women for STIs. Rapid diagnostic tests for HIV and syphilis are now available in antenatal clinics in many developing countries; however, easy to use, affordable, highly sensitive and specific rapid diagnostic tests for chlamydia, trichomonas and gonorrhoea are not yet widely available.¹⁴ PNG national guidelines for antenatal assessment include HIV testing and syphilis screening, but recommend syndromic management for the diagnosis and management of other STIs.¹⁵ This approach relies on clinical symptoms and signs in the absence of laboratory confirmation, and thus lacks sensitivity, as up to

80% of women with chlamydia, gonorrhoea or trichomonas infection will not present with symptoms, particularly during pregnancy.¹⁶ In the study by Vallely *et al.*, vaginal discharge and/or abdominal pain were only reported in ~20% of women, and multivariable analysis found no associations between clinical symptoms and STI diagnosis. This demonstrates that relying on syndromic management in this group would mean that a considerable number of STIs would not be diagnosed.

This highlights the urgent need for point-of-care (POC) tests for chlamydia, gonorrhoea and trichomonas to be fast tracked. When POC HIV and syphilis tests have been implemented in low and middle income countries, antenatal HIV and syphilis screening uptake has increased.¹⁷ However, the introduction of any POC testing methodology requires considerable forethought and planning as there will be barriers to implementation that need to be addressed, including ensuring adequate training for healthcare workers, identifying how POC testing fits into existing clinical management pathways, the ongoing provision of sufficient resources and consumables and patients' knowledge and acceptance of the tests.¹⁸ Nevertheless, it is very encouraging to see that a cluster randomised controlled trial will commence shortly in PNG to trial POC STI testing among antenatal women using the GeneXpert assay (Cepheid, Sunnyvale, CA, USA), a molecular-based POC system that has very high sensitivity and specificity for the detection of chlamydia, gonorrhoea and trichomonas.¹⁹

There is also the issue of re-infection following treatment of an STI. Research in PNG has found that due to taboos and misconceptions about the safety of sex during pregnancy, couples may be subjected to long periods of sexual abstinence and this can contribute to either partner seeking sex outside of marriage.²⁰ Condom use is low, making women at increased risk of repeat STI infection.²⁰ There have been many calls for greater involvement of men in reproductive and maternal health care as there are a range of potential benefits of involving men, including providing the opportunity to test and treat partners, thereby reducing the risk of re-infection among women, and to discuss the risk of STIs and their potential impact on the pregnancy and newborn. There is evidence that programs that promote gender-equitable relationships and address social context are more effective in generating behaviour change among men. Sexual and reproductive health programs in Laos, Kingdom of Cambodia, India, South Africa and Indonesia have shown that when expectant fathers are encouraged to attend antenatal care, they are keen to do so.²⁰

Symptom recognition among men is also an important factor in reducing STI rates. While chlamydia infections are largely asymptomatic in both women and men, urethral gonorrhoea infection in men is usually symptomatic. It has been suggested that for gonorrhoea prevalence to fall dramatically, men need to be tested and treated within a few days of onset of symptoms, otherwise they will continue to transmit the infection.²¹ Greater education of Papua New Guinean men about the symptoms and consequences of STIs for their own health, and that of their partner and future children, is urgently required. However, education is not enough. Services must be reliably available locally to ensure timely access. Primary health facilities, traditionally dominated by clinics for women and children, must also be a welcoming environment for men. In addition,

male-dominated workplaces and industries have a significant role to play in provision of services and in encouraging men to prioritise seeking treatment for STI symptoms.

There is no simple solution to the high rates of STIs in PNG, but improved access to culturally appropriate, affordable health care will be vital, as will improved recognition of symptoms among men. Point-of-care STI testing for women and men offers enormous promise in PNG. However, this needs to be combined with efforts to address social and behavioural factors, such as gender inequality, violence against women and concurrent sexual relationships, which are known to contribute to the high rates of STI in the country.

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