

Asia-Pacific Consensus Recommendations for Screening and Testing for Sexually Transmitted Infections – A Modified Delphi Method



A joint venture between The University of Melbourne and The Royal Melbourne Hospital

David Whiley¹, Adilahtul Bushro Binti Zaini², **Francesca Azzato**³, Gilho Lee⁴, Hung-Chin Tsai⁵, Opass Putcharoen⁶, Stephane Wen-Wei Ku⁷, Benson Yeo Koon Wee⁸, Norliza Ibrahim⁹, Ryoichi Hamasuna¹⁰, Tran Thi Nhat Thien Trang¹¹, Seema Sood¹², Catriona Bradshaw^{13,14}

¹The University of Queensland Centre for Clinical Research, The University of Queensland, Brisbane, Queensland, Australia, ²Hospital Sungai Buloh, Selangor, Malaysia, ³Victorian Infectious Diseases Reference Laboratory, The Peter Doherty Institute for Infection and Immunity, Melbourne, Victoria, Australia, ⁴Department of Urology, Dankook University College of Medicine, Cheonan, Republic of Korea, ⁵Division of Infectious Diseases, Department of Medicine, Kaohsiung Veterans General Hospital, Taiwan, ⁶Division of Infectious Disease, Department of Medicine, Faculty of Medicine, Emerging Infectious Disease Clinical Center, King Chulalongkorn Memorial Hospital, Chulalongkorn University, Bangkok, Thailand, ⁷Division of Infectious Diseases, Department of Medicine, Taipei City Hospital Renai Branch, Taipei, Taiwan, ⁸Department of Sexually Transmitted Infections Control (DSC) Clinic, National Skin Centre, Singapore, ⁹Sector for Prevention and Control Program of HIV/STI/Hepatitis C, Disease Control Division, Ministry of Health Malaysia, Malaysia, ¹⁰Department of the Urology, Shin-Kokura Hospital, Fukuoka, Japan, ¹¹Obstetrics & Gynaecology Outpatient Department, Tu Du Hospital, Ho Chi Minh City, Vietnam, ¹²Department of Microbiology, All India Institute of Medical Sciences, New Delhi, India, ¹³Melbourne Sexual Health Centre, Alfred Hospital, Carlton, Victoria, Australia and ¹⁴Central Clinical School, Monash University, Melbourne, Victoria, Australia.

1. Introduction

- Sexually transmitted infections (STIs) are the most common infectious diseases globally with an estimated one million new cases reported daily.^{1,2}
- Certain demographic groups face an elevated risk of contracting sexually transmitted infections (STIs). These groups include men who have sex with other men (MSM), adolescent girls and young women, sex workers, pregnant women and transgender individuals.^{3,4}
- The prevalence of drug-resistant strains, notably *N. gonorrhoeae* and *M. genitalium*, has seen a significant surge in recent times.^{5,6}
- At the Asia-Pacific level, sexually transmitted infections (STIs) are a major cause for concern, with reported rates in 2018 showing 132.1 cases of chlamydia and 35.1 cases of gonorrhoeae per 100,000 population.⁷
- In the Western Pacific region, ASHM's 2021 report indicated an estimated 86 million individuals aged 15-49 infected with STIs, and tens of millions continue to be infected annually.⁸
- In the Asia-Pacific region, infections of both *T. vaginalis* and *M. genitalium* are not officially reported, making their true prevalence in the region unknown. However, global studies have indicated a notable increase in *M. genitalium* rates, especially among high-risk groups like men who have sex with men, with reported increases ranging from 5% to 20%.⁹
- T. vaginalis* infections have become rare in the general population in Australia but still persist at higher rates in certain sub-populations, such as female commercial sex workers in Vietnam.¹⁰
- In the Asia-Pacific (APAC) region, the primary approach for treating *C. trachomatis* and *N. gonorrhoeae* infections is syndromic management, where treatment is administered based on symptoms or syndromes, such as urethral discharge, urethral pain, or vaginal discharge.
- To reduce morbidity and complications, timely diagnosis, and access to accurate diagnostic tests and effective treatments are needed.¹

2. Methodology

Study design

- The consensus recommendations were developed in accordance with the modified Delphi-based approach.¹¹
- The process was conducted from October 2022- April 2023

Delphi Process

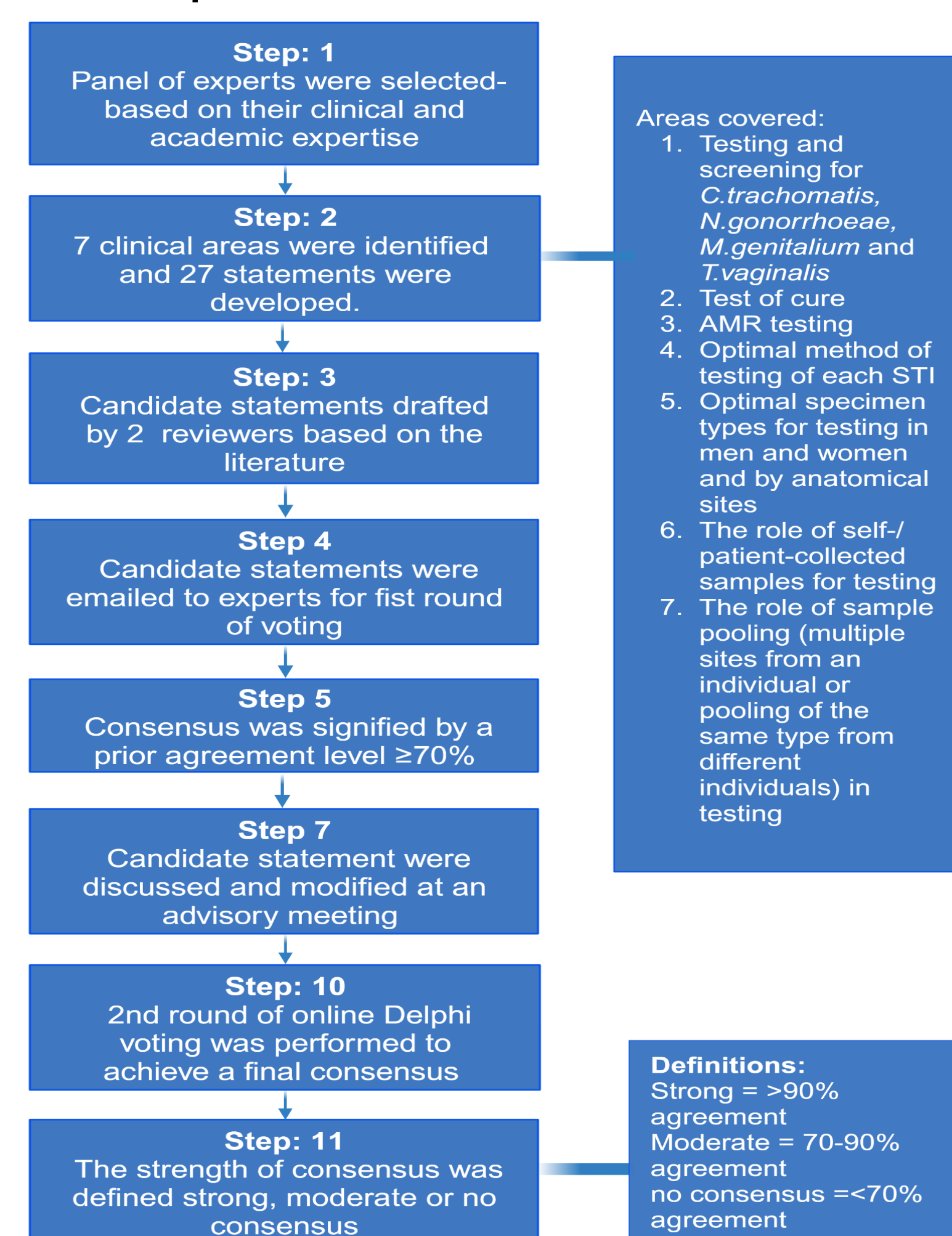


Figure 1: Delphi Voting Process flow chart. Created with BioRender.com

3. Results

Consensus Questions and Statements		Agreement rating- Delphi 1	Agreement rating – Delphi 2
Question 1: Who should be tested/screened for Chlamydia trachomatis, Neisseria gonorrhoeae, Mycoplasma genitalium, and Trichomonas vaginalis? What should be the frequency of testing/screening?			
Statement 1	Testing for <i>C. trachomatis</i> and <i>N. gonorrhoeae</i> is recommended in individuals with risk factors and who experience genitourinary or oropharyngeal or systemic symptoms.	91.7%	100%
Statement 3	Testing for <i>T. vaginalis</i> should be informed by the local epidemiology, where available. In high-prevalence settings, testing should be undertaken in – 1. Women with persistent vaginal discharge 2. Men with persistent 3. Individuals with a partner with <i>T. vaginalis</i> infection	50%	92.3%
Statement 5	Testing for <i>M. genitalium</i> can be considered in individuals with symptomatic urethritis or cervicitis or symptoms and signs of PID at first visit, where resources are available to support testing. In resource-constrained settings, testing should be considered for individuals with persistent symptoms, who had tested negative for chlamydia and/or gonorrhoea.	83%	92.3%
Question 2: Should a test of cure (TOC) be considered?			
Statement 9	TOC for gonococcal infection by culture or NAAT is recommended for any person with pharyngeal gonorrhoea after 14 days or more from the initial treatment. If TOC is performed in less than 14 days after the initial treatment, only culture is recommended	83.3%	100%
Statement 10	TOC for <i>M. genitalium</i> can be performed to ensure microbiological cure and is recommended in patients with ongoing symptoms. A TOC should not be performed less than 14 days from completion of treatment.	63.3%	100%
Question 3: Should antimicrobial resistance (AMR) tests be considered?			
Statement 12	All <i>M. genitalium</i> -positive specimens are recommended to undergo antimicrobial resistance/susceptibility testing (usually limited to macrolide-resistance testing) by NAAT.	33.3%	92.3%
Question 4: What is the optimal method of testing for each STI?			
Statement 13	NAAT is recommended for the detection of <i>C. trachomatis</i> and <i>N. gonorrhoeae</i> from urogenital and non-genital sites (rectal and pharyngeal) owing to their high sensitivity and comparable specificity when compared with culture.	91.7%	-
Statement 15	NAAT for <i>M. genitalium</i> is widely used for urine and urethral, penile meatal, endocervical, and vaginal swab samples.	91.7%	-
Question 5: What are the optimal specimen types for testing for C. trachomatis, N. gonorrhoeae, T. vaginalis, and M. genitalium in men and women and by anatomical site?			
Statement 16	The optimal specimen types for testing and screening for <i>C. trachomatis</i> , <i>N. gonorrhoeae</i> , <i>T. vaginalis</i> , and <i>M. genitalium</i> in women is a vaginal swab	75%	84.6%
Statement 17	The optimal specimen for testing and screening for <i>C. trachomatis</i> , <i>N. gonorrhoeae</i> , <i>T. vaginalis</i> , and <i>M. genitalium</i> in men is FVU.	91.7%	100%
Statement 18	Testing of rectal and/or oropharyngeal swabs for <i>C. trachomatis</i> and <i>N. gonorrhoeae</i> infection are optimal specimen types among persons who engage in receptive anal and/or oral intercourse (Level of evidence 2)	66.7%	100%
Statement 19	Rectal infection of <i>M. genitalium</i> is common in MSM and hence anorectal swab testing is recommended in any patient with persistent anorectal symptoms who tests negative for <i>C. trachomatis</i> and <i>N. gonorrhoeae</i> .	85%	100%
Question 6: Can self-/patient-collected samples be considered for testing?			
Statement 21	Self-collected vaginal swab specimens (for women) and FVU (for men) are of adequate sensitivity compared to those collected by a clinician and this screening strategy for <i>C. trachomatis</i> and <i>N. gonorrhoeae</i> is acceptable.	91.7%	-
Statement 23	The NAAT performance on self-collected rectal and oropharyngeal swabs is comparable to clinician-collected swabs and is acceptable for testing <i>C. trachomatis</i> and <i>N. gonorrhoeae</i> among men (Level of evidence 2).	91.7%	-
Statement 24	Self-collected vaginal swabs for testing <i>T. vaginalis</i> provide equivalent results to clinician-taken swabs when using NAATs.	83.3%	100%
Question 7: What is the role of sample pooling (multiple sites from an individual or pooling of the same sample type from different individuals) in testing?			
Statement 26	Pooling of samples from multiple anatomic sites (oropharyngeal, rectal, and urine/urogenital) of a single individual for testing of <i>C. trachomatis</i> and <i>N. gonorrhoeae</i> is of adequate sensitivity and specificity compared with single-site testing and may be considered to maximize screening and to reduce testing cost.	75%	92.3%

Outcomes

- The majority of statements achieved strong agreement (90% consensus).
- Two statements linked to question 3 and question 5 achieved moderate agreement (70-90%).

TABLE 1: Clinical questions for the consensus recommendation and a summary of agreement ratings for the two rounds of Delphi voting.

The statements present in this table were selected based on their ability to provide explicit recommendations.

4. Discussion

- A set of twenty-eight consensus statements has been developed, addressing recommendations for testing and screening, treatment of infections (TOC), antimicrobial resistance (AMR) testing, the most suitable sample for testing, the role of self-sampling, and sample pooling for sexually transmitted infections (STIs).
- The expert panel recognizes that nucleic acid amplification testing (NAAT) is not widely utilized in the APAC region due to resource limitations. As a result, AMR testing for *N. gonorrhoeae* and *M. genitalium* is currently practiced in select settings in Australia, India, and South Korea.
- Expert opinion suggests that a sample pooling strategy could potentially alleviate resource constraints in testing, but it must undergo validation by the respective institution.
- The evidence-based guidance and expert opinions presented can serve as a point of reference for informing, standardising, and optimising testing and screening strategies for *C. trachomatis*, *N. gonorrhoeae*, *M. genitalium*, and *T. vaginalis* infections in the APAC region.
- The adoption of this consensus should be contingent upon the availability of diagnostic tests and treatments, as well as the local epidemiological situation, available resources, and healthcare requirements.
- In conclusion, there is a need for further research in the APAC region to refine future recommendations.

References

- World Health Organisation. Available on <https://who.int/news-room/fact-sheets/detail/sexually-transmitted-infections-stis>. Accessed on 01.09.2023
- Hlatshwayo, M., Reno, H.E.L., Yarbrough, M.L. STI update: Testing, treatment and emerging threats. *Cleve Clin J Med.* 2019; 86:733-740
- Traeger, M., Stoope, M. Why risk matters for STI control: who are those at greatest risk and how are they identified? *Sexual Health.* 2022;19:265-277
- Adamson, P.C., Loeffelholz, M.J., Kalusner, J.D. Point-of-care testing for sexually transmitted infections: A review of recent developments. *Arch Pathol Lab Med.* 2020; 144:1344-1351
- Peel, J., Aung, E., Bond, S., Bradshaw, C. Recent advances in understanding and combatting *Mycoplasma genitalium*. *Fac Rev.* 2020; 9:3
- Kirkcaldy, R.D., Weston, E., Segurdo, A.C., Hughes, G. Epidemiology of gonorrhoeae: A global perspective. *Sex Health.* 2019;16:401-411
- Centre for Disease Control and Prevention. Available on <https://www.cdc.gov/nchstp/healthdisparities/asians.html>. Accessed on 01.09.2023
- ASHM. Landscape Review on STIs in the Western Pacific Region. Available on <https://ashm.org.au/global/asia-and-pacific-region>. Accessed on 01.09.2023
- Horseman, T.S., Crecelius, E.M., Miller, M.A., Lustick, M.B., Lee, B.C., Brazer, M.L., O'Neal, L.L., Kim, D.M., Fong, K.S.K., Chang, T.W. Prevalence and Epidemiology of *Mycoplasma genitalium* in a Pacific-Region Military Populations. *Sex Transm Infect.* 2021;48(8).
- Nguyen, T.V., Van Khuu, N., Thi L. T.T. *et al* Sexually Transmitted Infections and Risk Factors for Gonorrhoea and Chlamydia in Female Sex Workers in Soc Trang, Vietnam. *Sex Trans Dis.* 2008; 35:935-940.
- Gustafon, D.H., Shukla, R.K., Delbecq, A., Walster, G.W. A comparative study of differences in subjective likelihood estimates made by individuals, interacting groups, Delphi groups and nominal groups. *Organ Behav Hum Perform.* 1973; 9:230-291

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Contact:

Francesca.Azzato@vidrl.org.au