

Supplementary Table 1: Study Characteristics

Reference	Study Design	Country	Infections Assessed	Type of Test	Test Name	Population	Sample Size
Bercot, 2015 ¹	Cross-sectional	France	<i>C trachomatis</i> , <i>N gonorrhoeae</i> , <i>T vaginalis</i> , <i>M genitalium</i> , <i>M hominis</i> , <i>U urealyticum</i> , <i>U parvum</i>	Molecular Assay	Anyplex II STI-7 Detection Kit PCR	Symptomatic and paucisymptomatic patients	202
Brosh-Nissimov, 2018 ²	Retrospective cohort	Israel	<i>C trachomatis</i> , <i>N gonorrhoeae</i> , <i>T vaginalis</i> , <i>M genitalium</i> , <i>M hominis</i> , <i>U urealyticum</i> , <i>U parvum</i>	Molecular Assay	Anyplex II STI-7 Detection Kit PCR	Female and male Israeli soldiers	2816
Causer, 2015 ³	Cross-sectional	Australia	<i>C trachomatis</i> , <i>N gonorrhoeae</i>	Molecular Assay	GeneXpert CT/NG Test	Aboriginal populations	198
Causer, 2018 ⁴	Cluster RCT crossover	Australia	<i>C trachomatis</i> , <i>N gonorrhoeae</i>	Molecular Assay	GeneXpert CT/NG Test	Individuals presenting for STI testing	2486
Choe, 2013 ⁵	Cross-sectional	South Korea	<i>C trachomatis</i> , <i>N gonorrhoeae</i> , <i>T vaginalis</i> , <i>M genitalium</i> , <i>M hominis</i> , <i>U urealyticum</i>	Molecular Assay	Anyplex II STI-7 Detection Kit PCR, Seeplex PCR, BD ProbeTec strand displacement amplification, AmpliSens PCR, Mycoplasma IST 2 Kit	Symptomatic patients and asymptomatic volunteers	897

Reference	Study Design	Country	Infections Assessed	Type of Test	Test Name	Population	Sample Size
De Baetselier, 2018 ⁶	Cross-sectional	Belgium	<i>C trachomatis</i> , <i>N gonorrhoeae</i>	Molecular Assay	Abbott Real-Time (RT) CT/NG assay	MSM	98
De Baetselier, 2017 ⁷	Cross-sectional	Belgium	<i>M genitalium</i> , <i>T vaginalis</i>	Molecular Assay	S-DiaMGTV multiplex kit of Diagenode	MSM	1768
Fernandez, 2016 ⁸	Cross-sectional	Spain	<i>C trachomatis</i> , <i>M genitalium</i> , <i>M hominis</i> , <i>U urealyticum</i> , <i>U parvum</i>	Molecular Assay	Anyplex II STI-7 Detection Kit PCR	Individuals seeking care suspected of having an STI, HIV-negative men who have sex with men	267
Fisher, 2015 ⁹	Cross-sectional	United States	HCV	Immunochromatographic Test	MedMira HIV/HCV, MedMira HIV/HCV/HBV, Chembio HIV/HCV, Chembio HIV/HCV/syphilis	At-risk individuals (>15 years of age), including injection drug users; women with at least two recent partners; men who have sex with men/women; transgender individuals	1048
Foschi, 2017 ¹⁰	NA	Italy	<i>C trachomatis</i> , <i>N gonorrhoeae</i>	Molecular Assay	Aptima Combo2 [®] for CT and NG detection	Women attending outpatient STI clinics complaining of genital STI-related symptoms or reporting unsafe intercourse	100

Reference	Study Design	Country	Infections Assessed	Type of Test	Test Name	Population	Sample Size
Gimenes, 2014 ¹¹	Cross-sectional	Brazil	<i>C trachomatis</i> , <i>N gonorrhoeae</i> , <i>M genitalium</i> , HSV 1, HSV-2, <i>T pallidum</i> , HPV	Molecular Assay	PCR-Restriction Fragment Length Polymorphism (PCR-RFLP)	Infertile men	76
Han, 2014 ¹²	Cross-sectional	China	<i>C trachomatis</i> , <i>N gonorrhoeae</i>	Molecular Assay	Abbott RealTime CT/NG assay on the automated m2000 molecular platform	Female sex workers	997
Ho, 2015 ¹³	Cross-sectional	Taiwan	HPV	Molecular Assay	Multiplex real-time quantitative reverse transcriptase PCR	Women	684
Jahan, 2014 ¹⁴	Cross-sectional	Bangladesh	<i>C trachomatis</i> , <i>N gonorrhoeae</i>	Molecular Assay	PCR	Males suspected of having urethritis	185
Kalla, 2019 ¹⁵	NA	Cameroon	HIV, HBV, HCV	Immunochromatographic Test	HIV/HCV/HBsAg (Triplex, Biosynex, France)	Volunteers	1206
Le Goff, 2010 ¹⁶	NA	Central African Republic	HSV-1, HSV-2	Molecular Assay	BioPlex 2200 immunoassay system	Adults clinically asymptomatic for herpes disease	51
Le Roy, 2012 ¹⁷	Cross-sectional	France	<i>C trachomatis</i> , <i>N gonorrhoeae</i> , <i>M genitalium</i>	Molecular Assay	Bio-Rad Dx CT/NG/MG assay	Males and females attending an STI clinic	453
Lodiongo, 2018 ¹⁸	Cross-sectional	Sudan	HIV, <i>T pallidum</i>	Immunochromatographic Test	SD Bioline HIV/Syphilis Duo RDT	Pregnant women	442

Reference	Study Design	Country	Infections Assessed	Type of Test	Test Name	Population	Sample Size
Longo, 2018 ¹⁹	Cross-sectional	Central African Republic	HIV, HBV, HCV	Immunochromatographic Test	HIV/HCV/HBsAG Combo Rapid Test Cassette (ITHD-C43)	Patients with unknown HIV status	71
Lorea, 2018 ²⁰	Cross-sectional	Belgium	<i>C trachomatis</i> , <i>M genitalium</i>	Molecular Assay	Taqman Array Card	Female students and MSM	129
Loubinoux, 2012 ²¹	Prospective cohort	NA	<i>C trachomatis</i> , <i>N gonorrhoeae</i> , <i>M genitalium</i>	Molecular Assay	Dx CT/ NG/MG real-time multiplex PCR	Men and women	840
Mawu, 2009 ²²	NA	Indonesia	<i>C trachomatis</i> , <i>N gonorrhoeae</i> , <i>M genitalium</i> , <i>T vaginalis</i>	Molecular Assay	Multiplex PCR	Female sex workers	221
Mboumba Bouassa, 2018 ²³	Cross-sectional	Chad	HIV, HBV, HCV	Immunochromatographic Test	HIV/HCV/HBsAG Combo Rapid Test Cassette (ITHD-C43)	Childbearing aged women in resource limited settings	266
McKechnie, 2009 ²⁴	Cross-sectional	Australia	<i>C trachomatis</i> , <i>N gonorrhoeae</i> , <i>M genitalium</i> , HSV-1, adenovirus, <i>T vaginalis</i> , <i>M hominis</i> , N meningitidis, <i>U urealyticum</i> , <i>U parvum</i>	Molecular Assay	Multiplex PCR-based reverse line blot (mPCR/RLB)	Male patients with and without urethral symptoms	529

Reference	Study Design	Country	Infections Assessed	Type of Test	Test Name	Population	Sample Size
Menzato, 2018 ²⁵	Cross-sectional	Guinea Bissau	HIV	Immunochromatographic Test	Abbott Determine	Inhabitants of rural Guinea Bissau, West Africa	898
Muvunyi, 2011 ²⁶	Case-control	Rwanda	<i>N gonorrhoeae</i> , <i>C trachomatis</i> , <i>T vaginalis</i> , <i>M genitalium</i> , HSV-2	Molecular Assay	Multiplex ligation-dependent probe amplification (STDFinder assay)	infertile women	242
Nateghi Rostami, 2017 ²⁷	Cross-sectional	Iran	<i>N gonorrhoeae</i> , <i>T vaginalis</i> , <i>C trachomatis</i>	Molecular Assay	Multiplex PCR	Women seeking care for genital complaints	300
Nunez-Forero, 2016 ²⁸	Cross-sectional	Colombia	<i>N gonorrhoeae</i> , <i>C trachomatis</i> , <i>T pallidum</i>	Molecular Assay	Acon Duo (for NG and CT)	Sexually active women aged 14-49 years with lower urinary tract infection symptoms	1444
Omoding, 2014 ²⁹	Cross-sectional	Uganda	HIV, <i>T pallidum</i>	Immunochromatographic Test	SD Bioline HIV/Syphilis Duo RDT	Pregnant women	220
Pant Pai, 2014 ³⁰	Cross-sectional	Canada and India	HIV, HBV, HCV <i>T pallidum</i>	Immunochromatographic Test	Mirad rapid TP/HBV/HIV/HCV antibody test (MedMira)	Injection drug users/ STI clinic attendees with an at-risk profile (migrants, commercial sex workers, labourers who have paid for sex)	484

Reference	Study Design	Country	Infections Assessed	Type of Test	Test Name	Population	Sample Size
Pant Pai, 2019 ³¹	Cross-sectional	India	HIV, HBV, HCV	Immunochromatographic Test	Multiplo HBc/HIV/HCV	Pregnant women presenting to care to outreach rural service units	510
Parnell, 2014 ³²	Cross-sectional	NA	HSV, <i>T pallidum</i>	Molecular Assay	Abbott Architect	Patients with syphilis	47
Roberts, 2011 ³³	Cross-sectional	NA	HPV	Molecular Assay	Internally developed multiplex HPV PCR system	Women aged 16-23 years	377
Rumyantseva, 2015 ³⁴	Cross-sectional	Sweden	<i>N gonorrhoeae</i> , <i>C trachomatis</i> , <i>M genitalium</i> , <i>T vaginalis</i>	Molecular Assay	AmpliSens PCR assay	STI clinic attendees	1261
Sachdev, 2013 ³⁵	Cross-sectional	India	<i>N gonorrhoeae</i> , <i>C trachomatis</i>	Molecular Assay	Internally developed multiplex PCR system	Women visiting gynaecology departments	412
Sednaoui, 2011 ³⁶	Prospective cohort	France	<i>C trachomatis</i> , <i>N gonorrhoeae</i> , <i>M genitalium</i>	Molecular Assay	Bio-Rad Dx CT/NG/MG Assay	Individuals who undergo STI screening, medical consultation or biological check-up	955
Stafylis, 2019 ³⁷	Cross-sectional	United States	HIV, <i>T pallidum</i>	Immunochromatographic Test	INSTI HIV-1/HIV-2/syphilis rapid antibody test kit	Individuals presenting for outpatient care at an AIDS Healthcare Foundation clinic	274

Reference	Study Design	Country	Infections Assessed	Type of Test	Test Name	Population	Sample Size
Suntoke, 2009 ³⁸	Cross-sectional	Uganda	<i>H ducreyi</i> , <i>T pallidum</i> , HSV-1, HSV-2	Molecular Assay	In-house PCR	Patients with genital ulcer disease	100
Vahidnia, 2014 ³⁹	Cross-sectional	The Netherlands	<i>C trachomatis</i> , <i>N gonorrhoeae</i> , <i>T vaginalis</i>	Molecular Assay	Aurora FLOW	Individuals with clinical suspicion of STI	896
Van der Pol, 2017 ⁴⁰	Cross-sectional	United States	<i>C trachomatis</i> , <i>N gonorrhoeae</i> , <i>T vaginalis</i>	Molecular Assay	BD Max CT/GC/TV	Individuals presenting for routine STI symptom evaluation or screening	2689
Vaughn, 2010 ⁴¹	Cross-sectional	United States	<i>T pallidum</i> , <i>Ureaplasma</i> spp, <i>M genitalium</i> , <i>T vaginalis</i> , HSV-1	Molecular Assay	FilmArray STD Panel	NA	101
Zhao, 2012 ⁴²	Cross-sectional	China	HPV-16, HPV-18, HSV-1, HSV-2	Molecular Assay	In-house multiplex PCR	Individuals with suspected HPV and HSV infection	187

Supplementary Table 2. STI Case Positivity, Positive Predictive Values and Negative Predictive Values as obtained from Screening Utilizing Molecular Assays

A. Chlamydia trachomatis

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
Vahidnia, 2014 ³⁹	Males and females with clinical suspicion of STI	7.1%	NA	Aurora FLOW	Vaginal (female) Urine (urethral), rectal & throat (male)	98.4 (NA)	100.0 (NA)
Rumyantseva, 2015 ³⁴	STI clinic attendees	6.3%	NA	AmpliSens PCR	Vaginal & urine (female) Urine (male)	100.0 (95.3-100.0)	99.8 (99.4-100.0)
Bercot, 2015 ¹	Symptomatic and paucisymptomatic patients	30.2%	82% with another STI	Anyplex II STI-7 Detection Kit PCR	Urine, endocervical, vaginal, pelvic fluid	95.5 (92.6-98.3)	92.5 (88.9-96.1)
Choe, 2013 ⁵	Symptomatic patients and asymptomatic volunteers	8.0%	21.7% with another STI		Urine, endocervical	100.0 (NA)	100.0 (NA)
Nunez-Forero, 2016 ²⁸	Sexually active females aged 14-49 years with lower urinary tract infection symptoms	9.7%	NA	Acon Duo	Endocervical	94.7 (NA)	91.3 (NA)
Han, 2014 ¹²	Female sex workers	19.0%	NA	Abbott RealTime CT/NG	Cervical	100.0 (97.3-100.0)	98.5 (97.4-99.2)
Choe, 2013 ⁵	Symptomatic	NA	NA	BD ProbeTec	Urine,	91.2 (NA)	98.8 (NA)

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
	patients and asymptomatic volunteers			strand displacement amplification	endocervical		
Choe, 2013 ⁵	Symptomatic patients and asymptomatic volunteers	NA	NA	Seeplex PCR	Urine, endocervical	92.3 (NA)	99.8 (NA)
Causer, 2015 ³	Aboriginal populations	8.3%	NA	GeneXpert CT/NG Test	Urine	94.1 (NA)	99.5 (NA)
Sednaoui, 2011 ³⁶	STI clinic attendees	8.1%	NA	Bio-Rad Dx CT/NG/MG Assay	Urogenital, anorectal	100.0 (95.3-100.0)	99.8 (99.4-100.0)
Van der Pol, 2017 ⁴⁰	Male STI clinic attendees	21.8%	4.2% with NG	BD Max CT/GC/TV	Urine (male)	96.1 (NA)	99.4 (NA)
	Female STI clinic attendees	7.1%	1.8% with 2 or more organisms		Vaginal (female)	99.3 (NA)	98.6 (NA)
Muvunyi, 2011 ²⁶	Infertile females	2.9%	NA	STDFinder (multiplex ligation-dependent probe amplification)	Vaginal	100.0 (NA)	100.0 (NA)
Nateghi Rostani, 2017 ²⁷	Females presenting with genital complaints	11.7%	0.7% with NG; 1.0% with TV	Multiplex PCR	Vaginal	100.0 (NA)	100.0 (NA)
Gimenes, 2014 ¹¹	Infertile males	8.0%	NA	PCR-Restriction Fragment Length	Semen	100.0 (NA)	100.0 (NA)

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
				Polymorphism (PCR-RFLP)			
Brosh-Nissimov, 2018 ²	Female and male Israeli soldiers	6.7%	14.0% for MG; 5.0% for NG; 15.4% for TV; 11.7% for UU; 10.2% for UP; 16.2% for MH	Anyplex II STI-7 Detection Kit PCR	NA	NA	NA
Causer, 2018 ⁴	Individuals presenting for STI symptom testing	8.5%	NA	GeneXpert CT/NG Test	Urine	NA	NA
De Baetselier, 2018 ⁶	Men who have sex with men	8.5%	NA	Abbott Real-Time (RT) CT/NG assay	Urine, anorectal, pharyngeal	NA	NA
Fernandez, 2016 ⁸	Individuals seeking care, young adults (25 years or less) suspected of having an STI, and HIV-negative men who have sex with men	28.8%	3.4% with NG	Anyplex II STI-7 Detection Kit PCR	Urine	NA	NA
Foschi, 2017 ¹⁰	Females attending outpatient STI clinics	25.0%	1.0% with NG; 2.0% with MG	Aptima Combo2 [®] for CT and NG detection	Urine, vaginal	NA	NA
Jahan, 2014 ¹⁴	Males suspected of having	14.6%	NA	PCR	Urethral discharge	NA	NA

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
	urethritis						
Le Roy, 2012 ¹⁷	Asymptomatic females	10.2%	0.7% with MG; 0.4% with NG	Bio-Rad Dx CT/NG/MG assay	Urine, vaginal, endocervical	NA	NA
Le Roy, 2012 ¹⁷	Symptomatic females	11.1%	NA		Urine, vaginal, endocervical	NA	NA
Le Roy, 2012 ¹⁷	Asymptomatic males	8.1%	NA		Urine	NA	NA
Le Roy, 2012 ¹⁷	Symptomatic males	8.3%	NA		Urine, urethral	NA	NA
Lorea, 2018 ²⁰	Female students	7.7%	NA	Taqman Array Card	NA	NA	NA
Loubinoux, 2012 ²¹	Males	4.9%	0.8% with another STI	Dx CT/NG/MG real-time multiplex PCR	Urine, other swabs	NA	NA
Loubinoux, 2012 ²¹	Females	6.9%	NA	Dx CT/NG/MG real-time multiplex PCR	Urine, vaginal, other swabs	NA	NA
Mawu, 2009 ²²	Female sex workers	27.0%	NA	Multiplex PCR	Urine, vaginal	NA	NA
McKechnie, 2009 ²⁴	Males with urethral symptoms	17.3%	0.2% with MG; 0.2% with UU; 0.2% with HSV-1 and UP; 0.2% with NM; 0.2% with HI; 0.4% with	Multiplex PCR-based reverse line blot (mPCR/RLB)	Urine, urethral	NA	NA
McKechnie, 2009 ²⁴	Males without urethral	2.8%		Multiplex PCR-based	Urine, urethral	NA	NA

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
	symptoms		MH	reverse line blot (mPCR/RLB)			
Sachdev, 2013 ³³	Females visiting gynaecology departments	26.3%	11.3% with NG	Internally developed multiplex PCR system	endocervical	NA	NA

CI, confidence interval; CT, *Chlamydia trachomatis*; GC or NG, *Neisseria gonorrhoeae*; HI, *Haemophilus influenzae*; HIV, human immunodeficiency virus; HSV, herpes simplex virus; kPCR, kinetic polymerase chain reaction; MG, *Mycoplasma genitalium*; MH, *Mycoplasma hominis*; NA, not available; NM, *Neisseria meningitidis*; STI, sexually-transmitted infection; PCR, polymerase chain reaction; STI, sexually-transmitted infection; TV, *Trichomonas vaginalis*; UP, *Ureaplasma parvum*; UU, *Ureaplasma urealyticum*.

B. *Neisseria gonorrhoeae*

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
Rumyantseva, 2015 ³⁴	STI clinic attendees	0.3%	NA	AmpliSens PCR	Vaginal & urine (female) Urine (male)	100.0 (40.2-100.0)	100.0 (99.7-100.0)
Bercot, 2015 ¹	Symptomatic and paucisymptomatic patients	13.9%	61% with another STI	Anyplex II STI-7 Detection Kit PCR	Urine, endocervical, vaginal, pelvic fluid	90.0 (85.9-94.1)	98.4 (NA)
Choe, 2013 ⁵	Symptomatic patients and asymptomatic	4.1%	21.7% with another STI		Urine, endocervical	79.4 (NA)	100.0 (NA)

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
	volunteers						
Han, 2014 ¹²	Female sex workers	2.2%	NA	Abbott RealTime CT/NG	Cervical	95.5 (75.1-99.2)	99.9 (99.3-100.0)
Sednaoui, 2011 ³⁶	STI clinic attendees	3.5%	NA	Bio-Rad Dx CT/NG/MG Assay	Urine, vaginal, endocervical, urethral	93.8 (NA)	100.0 (NA)
Choe, 2013 ⁵	Symptomatic patients and asymptomatic volunteers	NA	NA	Seeplex PCR	Urine, endocervical	90.0 (NA)	100.0 (NA)
Choe, 2013 ⁵	Symptomatic patients and asymptomatic volunteers	NA	NA	BD ProbeTec SDA	Urine, endocervical	96.0 (NA)	99.7 (NA)
Causer, 2015 ³	Aboriginal populations	3.5%	NA	GeneXpert CT/NG Test	Urine	100.0 (NA)	100.0 (NA)
Nunez-Forero, 2016 ²⁸	Sexually active females aged 14-49 years with lower urinary tract infection symptoms	1.4%	NA	Acon Duo	Endocervical	50.0 (NA)	98.6 (NA)
Van der Pol, 2017 ⁴⁰	Female STI clinic attendees	2.3%	NA	BD Max CT/GC/TV	Vaginal (female)	95.5 (NA)	99.8 (NA)
	Male STI clinic attendees	12.9%	NA		Urine (male)	99.1 (NA)	100.0 (NA)
Jahan, 2014 ¹⁴	symptoms suggestive of urethritis having urethral discharge	30.3%	NA	PCR	Urethral discharge	87.5 (NA)	100.0 (NA)

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
Muvunyi, 2011 ²⁶	Infertile females	4.1%	NA	STDFinder (multiplex ligation-dependent probe amplification)	Vaginal	100.0 (NA)	100.0 (NA)
Nateghi Rostami, 2017 ²⁷	Females presenting with genital complaints	5.7%	0.7% with CT; 1.7% with TV	Multiplex PCR	Vaginal	81.0 (NA)	100.0 (NA)
Gimenes, 2014 ¹¹	Infertile males	4.0%	NA	PCR-Restriction Fragment Length Polymorphism (PCR-RFLP)	Semen	100.0 (NA)	100.0 (NA)
Brosh-Nissimov, 2018 ²	Female and male Israeli soldiers	0.6%	0.5% with CT; 3.5% with MG; 0.6% with UU; 0.5% with UP; 0.5% with MH	Anyplex II STI-7 Detection Kit PCR	NA	NA	NA
Causer, 2018 ⁴	Individuals presenting for STI symptom testing	5.8%	NA	GeneXpert CT/NG Test	Urine, vaginal	NA	NA
De Baetselier, 2018 ⁶	Men who have sex with men	6.8%	NA	Abbott Real-Time (RT) CT/NG assay	Urine, anorectal, pharyngeal	NA	NA
Foschi,	Females attending	4.0%	NA	Aptima	Urine,	NA	NA

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
2017 ¹⁰	outpatient STI clinics			Combo2 [®] for CT and NG detection	vaginal		
Le Roy, 2012 ¹⁷	Asymptomatic females	0.6%	NA	Bio-Rad Dx CT/NG/MG assay	Urine, endocervical, vaginal	NA	NA
Le Roy, 2012 ¹⁷	Symptomatic females	3.7%	NA		Urine, endocervical, vaginal	NA	NA
Le Roy, 2012 ¹⁷	Asymptomatic males	0.4%	NA		Urine	NA	NA
Le Roy, 2012 ¹⁷	Symptomatic males	16.7%	NA		Urine, urethral	NA	NA
Loubinoux, 2012 ²¹	Males	1.2%	NA	Dx CT/NG/MG real-time multiplex PCR	Urine, other swabs	NA	NA
Loubinoux, 2012 ²¹	Females	1.4%	NA		Urine, vaginal, other swabs	NA	NA
Mawu, 2009 ²²	Female sex workers	11.0%	NA	Multiplex PCR	Urine, vaginal	NA	NA
McKechnie, 2009 ²⁴	Males with urethral symptoms	2.5%	0.2% with HI; 0.4% with CT	Multiplex PCR-based reverse line blot (mPCR/RLB)	Urine, urethral	NA	NA
Sachdev,	Females visiting	27.8%	NA	Internally	Endocervical	NA	NA

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
2013 ³³	gynaecology departments			developed multiplex PCR system			
Vahidnia, 2014 ³⁹	Males and females with clinical suspicion of STI	1.2%	NA	Aurora FLOW	Urine, vaginal, urethral, rectal, throat	NA	NA

CI, confidence interval; CT, *Chlamydia trachomatis*; GC or NG, *Neisseria gonorrhoeae*; NA, not available; MG, *Mycoplasma genitalium*; MH, *Mycoplasma hominis*; HI, *Haemophilus influenzae*; SDA, strand displacement amplification; STI, sexually-transmitted infection; PCR, polymerase chain reaction; TV, *Trichomonas vaginalis*; UP, *Ureaplasma parvum*; UU, *Ureaplasma urealyticum*.

C. Trichomonas vaginalis

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
Choe, 2013 ⁵	Symptomatic patients and asymptomatic volunteers	0.1%	21.7% with another STI	Anyplex II STI-7 Detection Kit PCR	Urine, endocervical	75.0 (NA)	100.0 (NA)
Choe, 2013 ⁵	Symptomatic patients and asymptomatic volunteers	NA	NA	Seeplex PCR	Urine, endocervical	100.0 (NA)	100.0 (NA)
Choe, 2013 ⁵	Symptomatic patients and asymptomatic volunteers	NA	NA	AmpliSens PCR	Urine, endocervical	37.5 (NA)	100.0 (NA)
Rumyantsev	STI clinic attendees	0.1%	NA		Vaginal &	100.0 (16.5-	100.0 (99.7-

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
a, 2015 ³⁴					urine (female) Urine (male)	100.0)	100.0)
Nateghi Rostami, 2017 ²⁷	Females presenting with genital complaints	32.7%	1% with CT; 32.7% with NG	Multiplex PCR	Vaginal	100.0 (NA)	100.0 (NA)
Van Der Pol, 2017 ⁴⁰	Female STI clinic attendees	13.5%	NA	BD Max CT/GC/TV	Vaginal	96.1 (NA)	98.9 (NA)
Muvunyi, 2011 ²⁶	Infertile females	19.4%	NA	STDFinder (multiplex ligation-dependent probe amplification)	Vaginal	55.3 (NA)	100.0 (NA)
Bercot, 2015 ¹	Symptomatic and paucisymptomatic patients	3.5%	100.0% with another STI	Anyplex II STI-7 Detection Kit PCR	Urine, endocervical, vaginal, pelvic	NA	NA
Brosh-Nissimov, 2018 ²	Female and male Israeli soldiers	0.4%	1.0% with CT; 0.9% with UU; 1.0% with UP; 2.2% with MH	Anyplex II STI-7 Detection Kit PCR	NA	NA	NA
Mawu, 2009 ²²	Female sex workers	23.0%	NA	Multiplex PCR	Urine, vaginal	NA	NA
McKechnie, 2009 ²⁴	Males with urethral symptoms	0.4%	NA	Multiplex PCR-based reverse line blot	Urine, urethral	NA	NA

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
				(mPCR/RL B)			
Vahidnia, 2014 ³⁹	Males and females with clinical suspicion of STI	1.1%	NA	Aurora FLOW	Urine, vaginal, urethral, rectal, throat	NA	NA
Vaughn, 2010 ⁴¹	STD clinic attendees	4.0%	NA	FilmArray STD Panel	Urine	NA	NA

CI, confidence interval; CT, *Chlamydia trachomatis*; GC, *Neisseria gonorrhoeae*; MH, *Mycoplasma hominis*; NA, not available; PCR, polymerase chain reaction; TV, *Trichomonas vaginalis*; UP, *Ureaplasma parvum*; UU, *Ureaplasma urealyticum*.

D. *Treponema pallidum*

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
Gimenes, 2014 ¹¹	Infertile males	5.3%	NA	PCR-Restriction Fragment Length Polymorphism (PCR-RFLP)	Semen	100.0 (NA)	100.0 (NA)
Suntoke,	Genital ulcer	5.0%	71.0% with	In-house	Ulcer, blood	100.0 (NA)	93.3 (NA)

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
2009 ³⁸	disease patients		another pathogen	PCR			
Nunez-Forero, 2016 ²⁸	Sexually active females aged 14-49 years with lower urinary tract infection symptoms	0.9%	NA	Acon Duo	Endocervical	NA	NA
Vaughn, 2010 ⁴¹	STD clinic attendees	1.0%	9.0% co-infected with two pathogens; 1.0% co-infected with three pathogens	FilmArray STD Panel	Urine	NA	NA

CI, confidence interval; NA, not available; PCR, polymerase chain reaction; STD, sexually-transmitted disease.

E. Herpes simplex virus

Reference	Strain	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
Gimenes, 2014 ¹¹	HSV-1	Infertile males	8.0%	NA	PCR-Restriction Fragment Length Polymorphism	Semen	75.0 (NA)	100.0 (NA)

Reference	Strain	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
					(PCR-RFLP)			
Suntoke, 2009 ³⁸		Genital ulcer patients	3.0%	64% with HIV or HSV-2	In-house PCR	Ulcer, blood	100.0 (NA)	12.5 (NA)
Le Goff, 2010 ¹⁶		Clinically asymptomatic adults	90.2%	NA	BioPlex 2200 immunoassay system	Serum	NA	NA
McKechnie, 2009 ²⁴		Males with urethral symptoms	2.2%	0.2% with HI; 0.2% with UP	Multiplex PCR-based reverse line blot (mPCR/RLB)	Urine, urethral	NA	NA
McKechnie, 2009 ²⁴		Males without urethral symptoms	0.8%			Urine, urethral	NA	NA
Vaughn, 2010 ⁴¹		STD clinic attendees	3.0%	NA	FilmArray STD Panel	Urine	NA	NA
Zhao, 2012 ⁴²		Patients with suspected HPV and HSV infection	10.2%	1.6% with HSV-2; 1.1% with HPV-16	In-house multiplex PCR	Genital, cervical	NA	NA
Gimenes, 2014 ¹¹	HSV-2	Infertile males	8.0%	NA	PCR-Restriction Fragment Length Polymorphism (PCR-RFLP)	Semen	100.0 (NA)	100.0 (NA)
Muvunyi, 2011 ²⁶		Infertile females	6.2%	NA	STDFinder (multiplex ligation-dependent probe)	Vaginal	40.0 (NA)	100.0 (NA)

Reference	Strain	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
					amplification)			
Suntoke, 2009 ³⁸		Genital ulcer patients	61.0%	64.0% with HIV or HSV-1	In-house PCR	Ulcer, blood	84.5 (NA)	36.1 (NA)
Le Goff, 2010 ¹⁶		Clinically asymptomatic adults	45.1%	NA	BioPlex 2200 immunoassay system	Serum	NA	NA
Zhao, 2012 ⁴²		Patients with suspected HPV and HSV infection	17.1%	1.6% with HSV-1; 2.7% with HPV-16; 2.1% with HPV-18; 1.1% with HPV-16 and HPV-18	In-house multiplex PCR	Genital, cervical	NA	NA
Parnell, 2014 ³²	Unspecified HSV strain	NA	2.1%	2.1% with TP	Abbott Architect	NA	NA	NA

CI, confidence interval; HI, *Haemophilus influenzae*; HPV, human papillomavirus; HSV, herpes simplex virus; NA, not available; PCR, polymerase chain reaction; TP, *Treponema pallidum*; UP, *Ureaplasma parvum*.

Supplementary Table 3. STI Case Positivity, Positive Predictive Values and Negative Predictive Values as obtained from Screening Utilizing Immunochromatographic Tests

A. Treponema pallidum

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
Omoding, 2014 ²⁹	Pregnant females	8.6%	1.4% with HIV	SD Bioline HIV/Syphilis Duo Test	Venous blood (plasma)	100.0 (79.1-100.0)	100.0 (97.7-100.0)
Stafylis, 2019 ³⁷	STI clinic attendees	27.0%	NA	INSTI Multiplex HIV-1/HIV-2/syphilis antibody test kit	Fingerstick blood	93.3 (NA)	86.0 (NA)
Lodiongo, 2018 ¹⁸	Pregnant females	3.2%	NA	SD Bioline HIV/Syphilis Duo RDT	Venous blood	NA	NA
Pant Pai, 2014 ³⁰	Injection drug users	1.8%	NA	Miriad rapid TP/HBV/HIV/HCV antibody test (MedMira)	Fingerstick blood	NA	NA
Pant Pai, 2014 ³⁰	STD clinic attendees	9.9%	NA			NA	NA

CI, confidence interval; HIV, human immunodeficiency virus; NA, not available.

B. Hepatitis C virus

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
Fisher, 2015 ⁹	Adult injection drug users, females who engage in risky sexual encounters, mwn who have sex with men and/or women, transgender adults	NA	NA	Chembio HIV/HCV/syp hilis	Whole blood	97.1 (93.0-98.9)	98.2 (96.9-99.0)
Fisher, 2015 ⁹	Adult injection drug users, females who engage in risky sexual encounters, mwn who have sex with men and/or women, transgender adults	NA	NA	MedMira HIV/HCV/HBV	Whole blood	100.0 (96.1-100.0)	96.2 (94.4-97.4)
Fisher, 2015 ⁹	Adult injection drug users, females who engage in risky sexual encounters, mwn who have sex with men	19.2%	NA	MedMira HIV/HCV	Whole blood	100.0 (96.2-100.0)	95.7 (94.0-97.0)

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
	and/or women, transgender adults						
Fisher, 2015 ⁹	Adult injection drug users, females who engage in risky sexual encounters, mwn who have sex with men and/or women, transgender adults	NA	NA	Chembio HIV/HCV	Whole blood	97.4 (93.1-99.2)	98.0 (96.6-98.9)
Kalla, 2019 ¹⁵	Volunteers	2.2%	NA	HIV/HCV/HBsAg (Triplex, Biosynex, France)	Blood	100.0 (84.5-100.0)	100.0 (99.6-100.0)
Longo, 2018 ¹⁹	Patients with unknown HIV status	4.2%	NA	HIV/HCV/HBsAg Combo Rapid Test Cassette (ITHD- C43)	Capillary blood	NA	NA
Mboumba Bouassa, 2018 ²³	Childbearing aged females in resource limited settings	7.5%	NA	HIV/HCV/HBsAg Combo Rapid Test Cassette (ITHD- C43)	Capillary blood	NA	NA

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
Pant Pai, 2014 ³⁰	Injection drug users	42.2%	NA	Miriad rapid TP/HBV/HIV/HCV antibody test (MedMira)	Fingerstick blood	NA	NA
Pant Pai, 2014 ³⁰	STD clinic attendees	0.5%	NA			NA	NA

CI, confidence interval; HIV, human immunodeficiency virus; HCV, hepatitis C virus; NA, not available; STD, sexually-transmitted disease.

C. Human immunodeficiency virus

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
Omoding, 2014 ²⁹	Pregnant females	7.3%	NA	SD Bioline HIV/Syphilis Duo test	Venous blood (plasma)	94.1 (69.2-99.7)	100.0 (97.7-100.0)
Lodiongo, 2018 ¹⁸	Pregnant females	1.8%	NA		Venous blood	100.0 (63.1-100.0)	100.0 (99.2-100.0)
Stafylis, 2019 ³⁷	STI clinic attendees	29.9%	NA	INSTI Multiplex HIV-1/HIV-2/syphilis antibody test kit	Fingerstick blood	100.0 (NA)	99.5 (NA)
Kalla, 2019 ¹⁵	Volunteers	2.1%	0.1% with HBV	HIV/HCV/HBs Ag (Triplex, Biosynex, France)	Blood	100.0 (83.4-100.0)	100.0 (99.6-100.0)

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
Longo, 2018 ¹⁹	Patients with unknown HIV status	7.1%	1.4% with HBV	HIV/HCV/HBs AG Combo Rapid Test Cassette (ITHD- C43)	Capillary blood	NA	NA
Mboumba Bouassa, 2018 ²³	Childbearing aged females in resource limited settings	3.7%	0.4% with HBV	HIV/HCV/HBs AG Combo Rapid Test Cassette (ITHD- C43)	Capillary blood	NA	NA
Menzato, 2018 ²⁵	Inhabitants of rural Guinea Bissau, West Africa	6.8%	NA	Abbott Determine	Vaginal	NA	NA
Pant Pai, 2014 ³⁰	Injection drug users	3.7%	NA	Miriad rapid TP/HBV/HIV/H CV antibody test (MedMira)	Fingerstick blood	NA	NA
Pant Pai, 2014 ³⁰	STD clinic attendees	14.9%	NA			NA	NA

CI, confidence interval; HBV, hepatitis B virus; HIV, human immunodeficiency virus; NA, not available; STD, sexually-transmitted disease.

D. Hepatitis B virus (HBV)

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
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Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections	Test Name	Specimen Type	Positive Predictive Value (95% CI)	Negative Predictive Value (95% CI)
Kalla, 2019 ¹⁵	Volunteers	8.6%	0.1% with HIV	HIV/HCV/HBs Ag (Triplex, Biosynex, France)	Blood	100.0 (95.6-100.0)	100.0 (99.6-100.0)

CI, confidence interval; HIV, human immunodeficiency virus; NA, not available.

Supplementary Table 4. Additional STI Case Positivity Results**A. Hepatitis B virus (HBV)**

Reference	Population at Risk	Case Positivity	Prevalence of Co-Infections
Longo, 2018 ¹⁹	Patients with unknown HIV status	23.9%	1.4% with HIV
Mboumba Bouassa, 2018 ²³	Childbearing aged females in resource limited settings	3.0%	0.4% with HCV
Pant Pai, 2014 ³⁰	STD clinic attendees	20.0%	NA
Pant Pai, 2019 ³¹	Pregnant females	1.1%	NA

HCV, hepatitis C virus; HIV, human immunodeficiency virus; NA, not available; STD, sexually-transmitted disease.

B. Human papillomavirus (HPV)

Reference	Strain	Population at Risk	Case Positivity	Prevalence of Co-Infections
Ho, 2015 ¹³	Any HPV	Females with no cervical abnormalities referred to undergo a cervical exam	92.8%	NA
Ho, 2015 ¹³	Any HPV	Females with cervical dysplasia (<CIN1)	94.0%	NA
Ho, 2015 ¹³	Any HPV	Females with CIN1	90.7%	NA
Ho, 2015 ¹³	Any HPV	Females with CIN2	92.6%	NA
Ho, 2015 ¹³	Any HPV	Females with CIN3	98.2%	NA
Ho, 2015 ¹³	Any HPV	Females with cervical cancer	96.1%	NA
Gimenes, 2014 ¹¹	Any HPV	Infertile males	38.0%	NA
Roberts, 2011 ³³	Any HPV	Females aged 16-23 years	69.2%	51.3% with multiple HPV co-infections
Zhao, 2012 ⁴²	HPV-16	Patients with suspected HPV and HSV infection	22.5%	1.6% with HPV-18; 1.1% with HSV-1; 2.7% with HSV-2; 1.1% with HPV-18 and HSV-2
Zhao, 2012 ⁴²	HPV-18	Patients with suspected	12.3%	1.6% with HPV-16;

Reference	Strain	Population at Risk	Case Positivity	Prevalence of Co-Infections
		HPV and HSV infection		2.1% with HSV-2; 1.1% with HPV-16 and HSV-2

CIN, cervical intraepithelial neoplasia; HPV, human papillomavirus; HSV, herpes simplex virus; NA, not available.

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